2.International Congress on Innovation Technologies & Engineering

June 12-13, 2023
Ege University, Izmir, Türkiye

Abstract Book

Editors:
Prof. Dr. Bahri BAŞARAN
Assist. Prof. Dr. Aysun BALTACI

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ABSTRACT BOOK

EGE

2nd INTERNATIONAL CONGRESS ON INNOVATION TECHNOLOGIES & ENGINEERING

June 12-13, 2023
Ege University, Izmir, Türkiye

Editors

Prof. Dr. Bahri BAŞARAN
Assist. Prof. Dr. Aysun BALTACI

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CONGRESS ID

TITLE OF CONGRESS

EGE
2nd INTERNATIONAL CONGRESS ON INNOVATION TECHNOLOGIES & ENGINEERING

PARTICIPATION

Keynote & Invited

DATE - PLACE

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Ege University, Izmir, Türkiye

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Türkiye, Azerbaijan, Uzbekistan, Pakistan, Algeria, Morocco, Malaysia, Indonesia, India, UK, Spain, Nigeria, Tunisia, Palestine, Georgia, Belgium, Kingdom of Saudi Arabia

TOTAL PAPERS: 140

The number of abstracts from foreign countries: **76**

The number of abstracts from Türkiye: **64**

LANGUAGES

Turkish, Uzbek, English, Russian,

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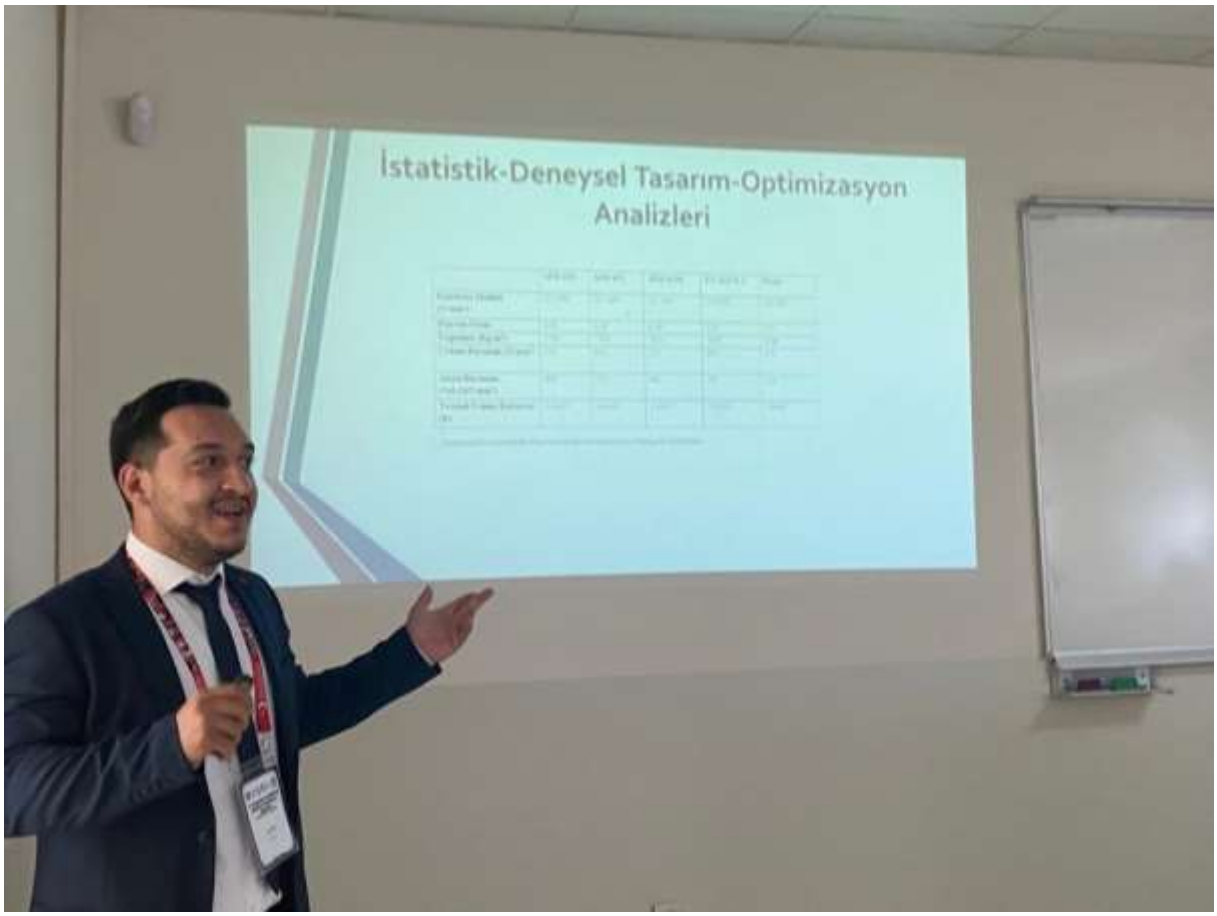
INTERNATIONAL EGE CONGRESSES-II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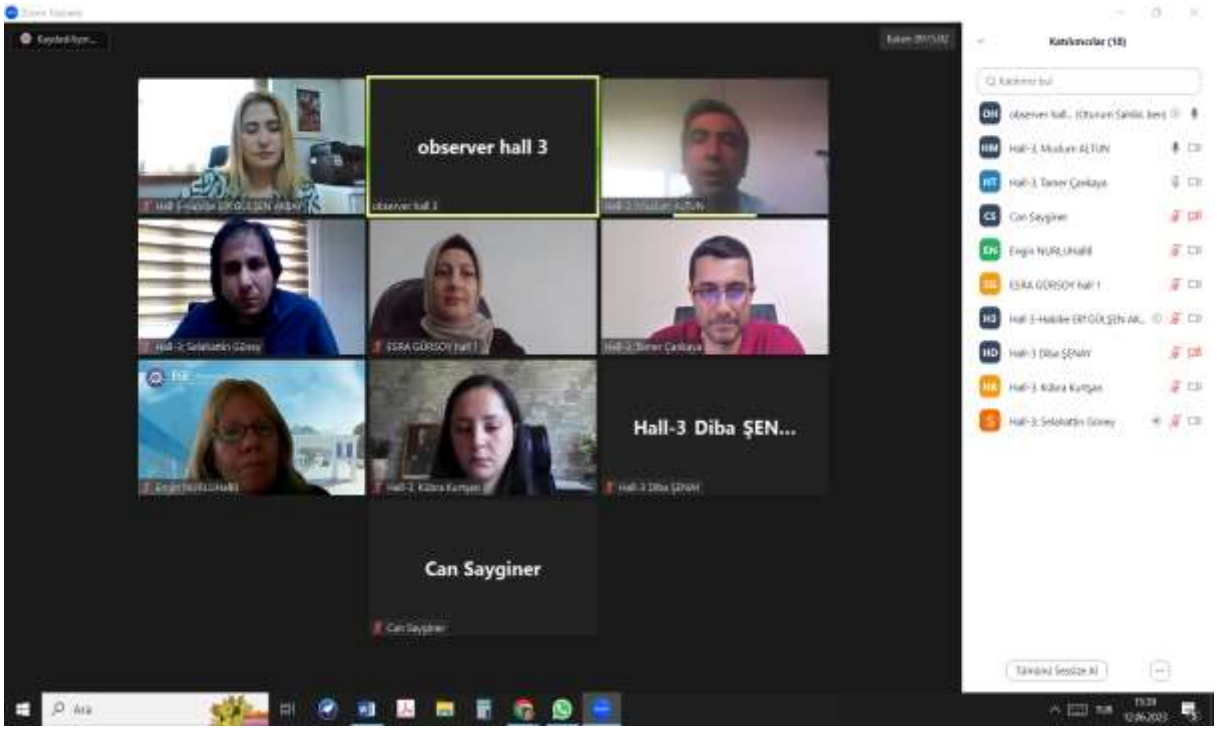
June 12-13, 2023 / Ege University,


observer hall 3
Hall-3 Diba ŞEN...
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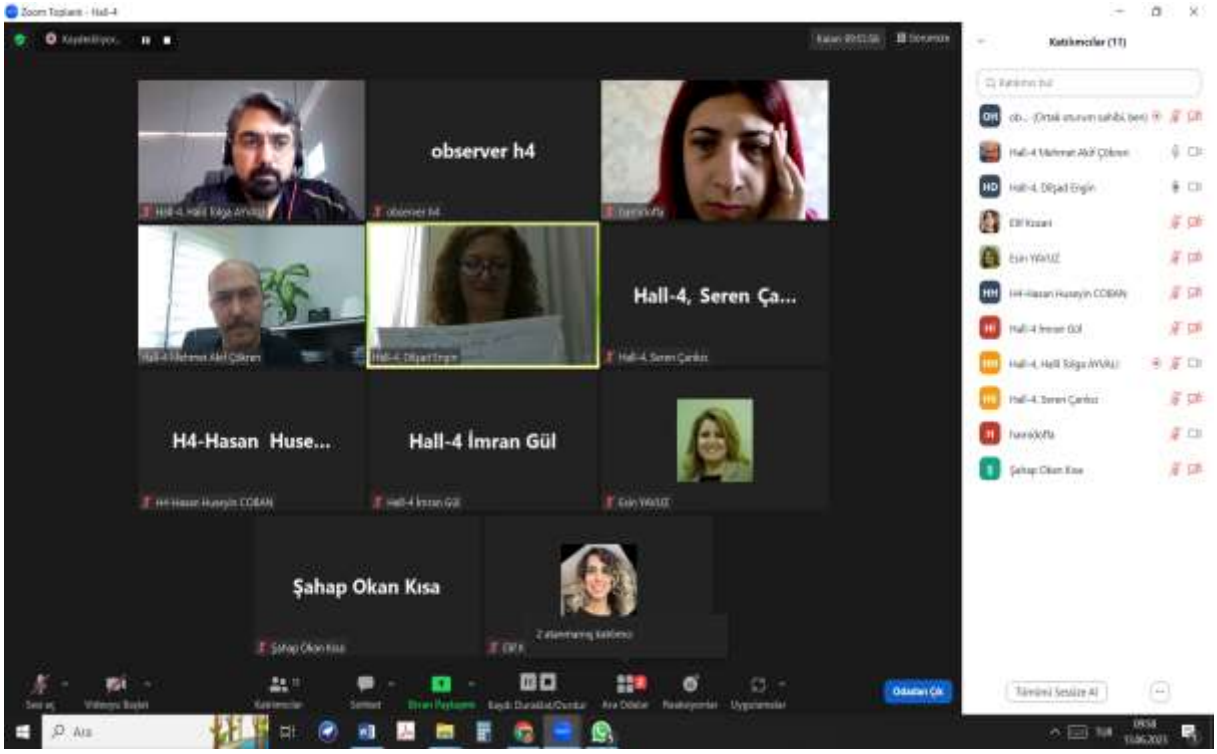
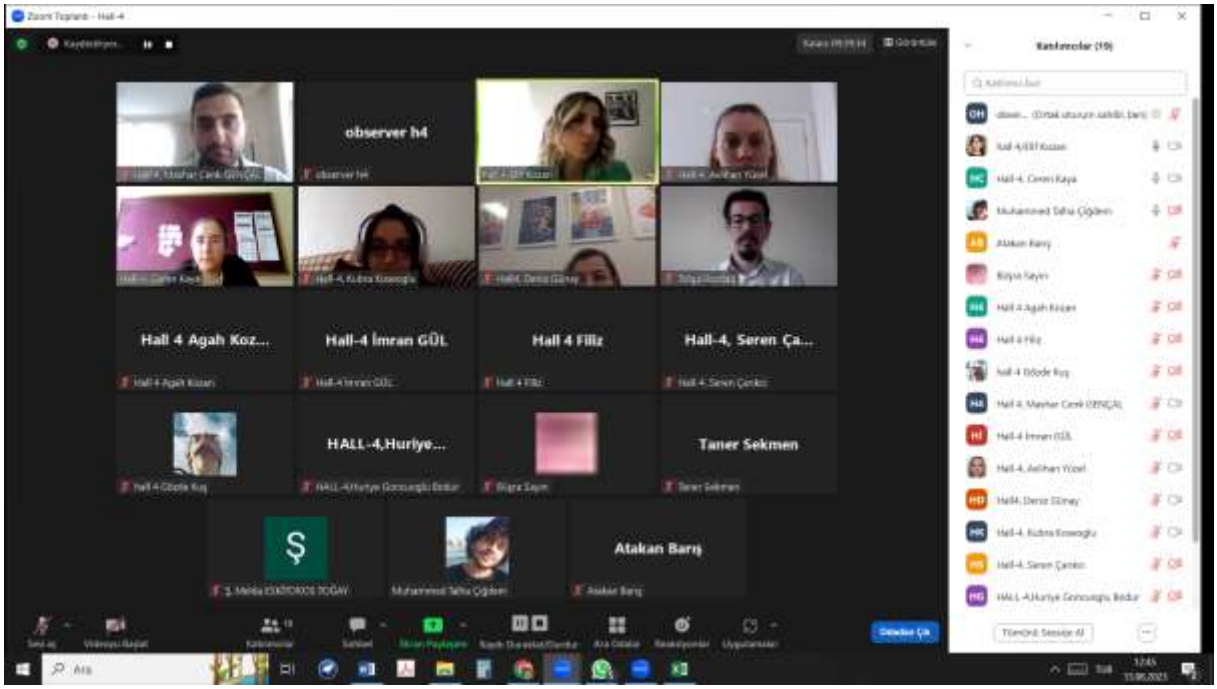

observer h4
Hall-4, Seren Ça...
H4-Hasan Huse...
Hall-4 İmran Gül
Şahap Okan Kısa
Katılımcılar (11)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Hall 4 Agah Koz...
Hall-4 İmran GÜL
Hall 4 Filiz
Hall-4, Seren Ça...
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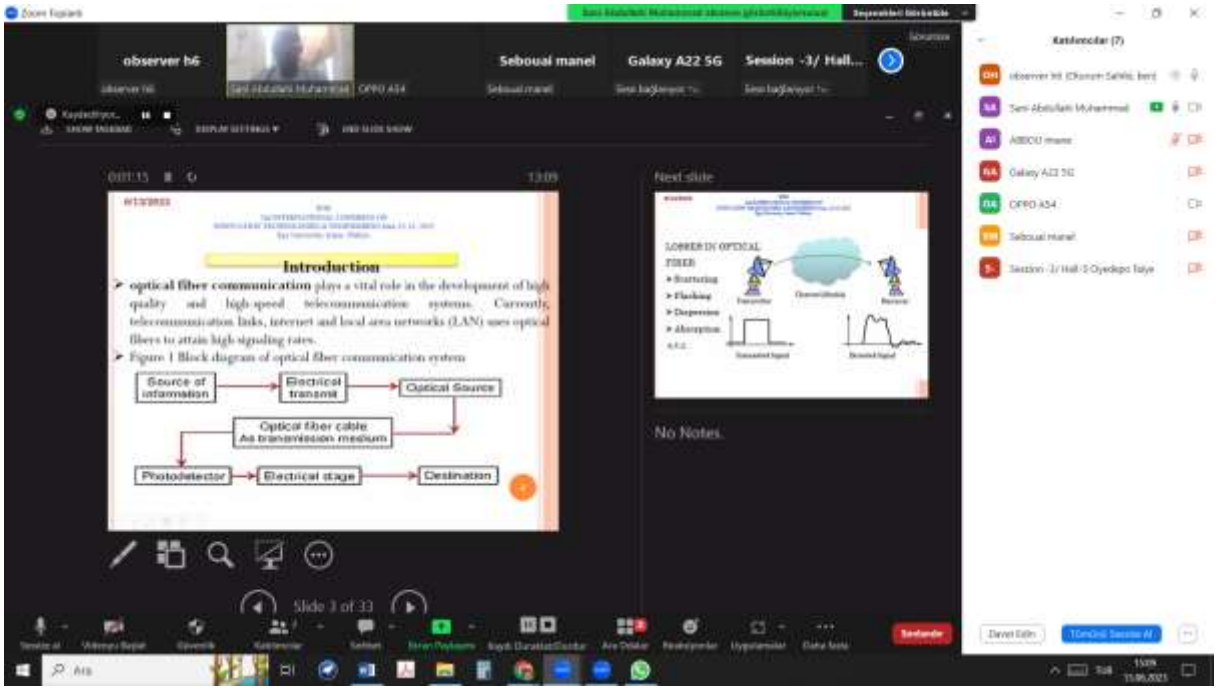
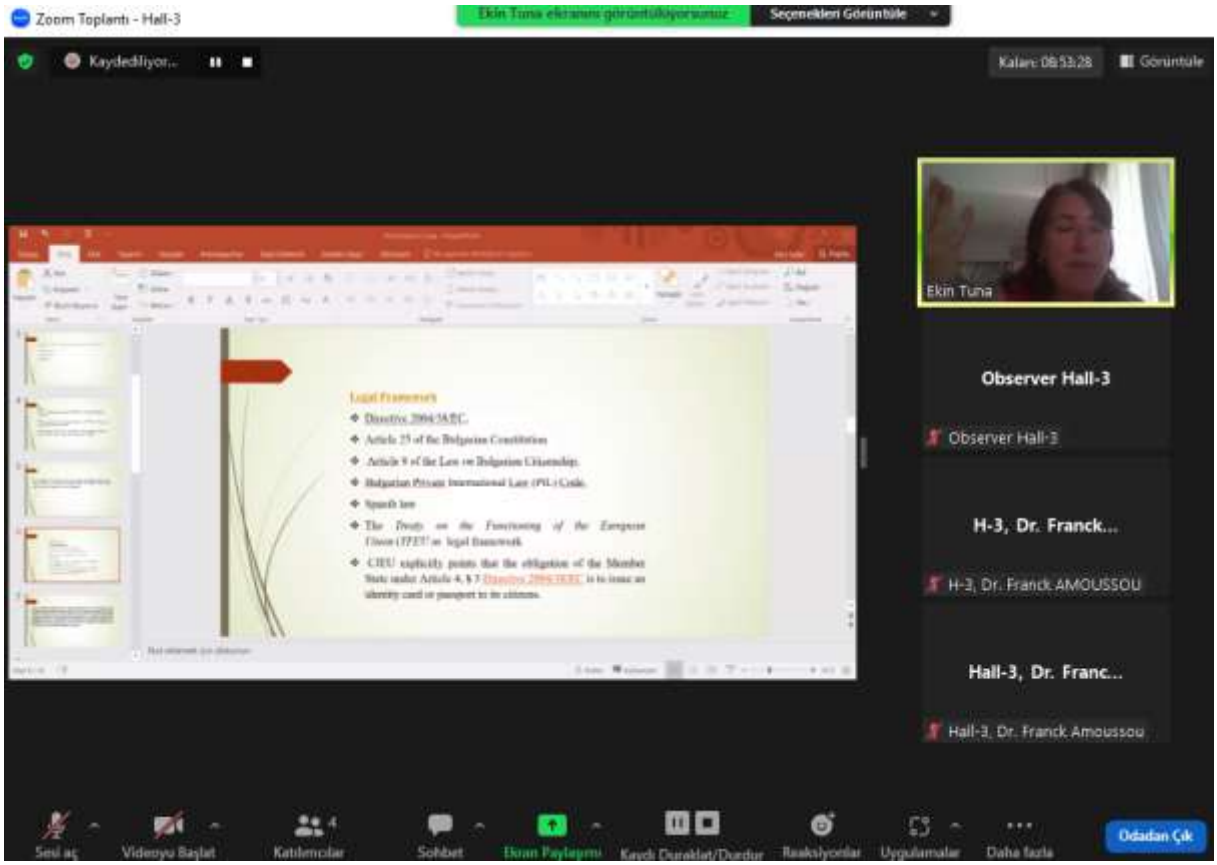

observer h6
Sebouai manel
Galaxy A22 5G
Session -3/ Hall...
Introduction
optical fiber communication plays a vital role in the development of high quality and high speed telecommunication systems. Currently, telecommunication links, internet and local area networks (LAN) uses optical fibers to attain high signaling rates.
Figure 1 Block diagram of optical fiber communication system
Source of information
Electrical transmit
Optical Source
Optical fiber cable As transmission medium
Photodetector
Electrical stage
Destination
Next slide
No Notes
Slide 3 of 33
Katılımcılar (7)


Observer Hall-1
Hall 1 AYŞE İZCİ
Serkan's iPhone
Edip Örücü
Muhammet İnce...
AYŞE İZCİ


Zoom Toplantı - Hall-3
Ekin Tuna ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kaydediliyor...
Kalan: 08:53:28
Görüntüle
Ekin Tuna
Observer Hall-3
Observer Hall-3
H-3, Dr. Franck...
H-3, Dr. Franck AMOUSSOU
Hall-3, Dr. Franc...
Hall-3, Dr. Franck Amoussou
Legal Framework
Sesi aç
Videoyu Başlat
Katılımcılar
Sohbet
Ekran Paylaşımı
Kayıt Duraklat/Durdur
Reaksiyonlar
Uygulamalar
Daha fazla
Odadan Çık

EGE

2nd INTERNATIONAL CONGRESS ON INNOVATION TECHNOLOGIES & ENGINEERING

June 12-13, 2023

Ege University, Izmir, Türkiye

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Türkiye, Azerbaijan, Uzbekistan, Pakistan, Algeria, Morocco, Malaysia, Indonesia, India, UK, Spain, Nigeria, Tunisia, Palestine, Georgia, Belgium, Kingdom of Saudi Arabia

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- Opening Ceremony-

Ege University, Faculty of Fisheries Conference Hall

12.06.2023

Time: 13:00-14:00

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Director of Ege University Graduate School of Natural and Applied Science

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FACE TO FACE (HALL- Z8)

12.06.2023

Moderator: Dr. Yavuz Öztürk

Address: Ege University, Faculty of Fisheries

Ankara Local Time: 14:30 – 16:30

TITLE	AUTHOR(S)	AFFILIATION
INCREASING EFFICIENCY IN NATURAL GAS REGULATOR INSTALLATIONS WITH IMAGE PROCESSING METHOD	Ruveyda TOSYA Hüseyin PEHLİVAN Duygu ALEMDAR	Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye/Sakarya Sakarya University, Türkiye
DEVELOPMENT OF NEW GENERATION SAFETY SHUTOFF VALVE TO BE USED IN NATURAL GAS LINES	Hüseyin PEHLİVAN Atıl ERİM	Sakarya University, Türkiye Türkiye Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye/Sakarya
IMPROVEMENT WORK ON MEMBRANES USED IN NATURAL GAS REGULATORS	Ruveyda TOSYA Hüseyin PEHLİVAN	Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye/Sakarya Sakarya University, Türkiye
A STUDY OF PHOTOACUSTIC EFFECT FOR TWO DIFFERENT THERMAL CONDUCTIVE MATERIALS	Damla Can ATICI İbrahim Akkaya Yavuz Öztürk	Ege University, Izmir, Türkiye
A NEW MODULATOR SURFACE DESIGN WITH FLUORESCENT LAMP ARRAY AS CURRENT CONTROLLED PLASMA REFLECTOR	Samed Gümüş Yavuz Öztürk	Ege University, Türkiye
INVESTIGATION OF THE MAGNETIC FIELD AND IT'S LINEARITY ON AN AXIS BETWEEN OF TWO CYLINDIRICAL MAGNETS	Beste Aydoğmuş Samed Gümüş Yavuz Öztürk	Ege University, Türkiye
MEASURING MAGNETIC FIELD OF A MAGNET ON A PLANE BY USING THREE AXES HALL SENSOR OF A SMARTPHONE	Mahshad Ramezanabady Utku Can Sayın Erkan Zeki Engin Yavuz Öztürk	Ege University, Türkiye
DEVELOPMENT OF TEXTILE PRODUCTS WITH ANTIMICROBIAL AND INNOVATIVE APPEARANCE	Emre SAKAN İrem PALABIYIK	Ar-Ge Merkez Mühendisi FG Grup Konfeksiyon Sanayi A.Ş. İzmir/Türkiye.
PREDICTION AND RECOMMENDATION PLATFORM BASED ON MACHINE LEARNING AND DEEP LEARNING FOR MANAGEMENT OF SERVICE LEVEL AGREEMENTS	Yavuz ŞAHİN Mehmet Hakkı ERSOY Senem ŞAHAN VAHAPLAR Ahmet FEYZİOĞLU	Experilabs (SahaBT Yazılım), İstanbul, Türkiye Marmara University, Türkiye

FACE TO FACE (HALL- Z9)

12.06.2023

Moderator: Prof. Dr. Ali MERT

Address: Ege University, Faculty of Fisheries

Ankara Local Time: 14:30 – 16:30

TITLE	AUTHOR(S)	AFFILIATION
THE POTENTIAL FOR USING PHYTOGENICS IN AQUACULTURE	Ebru YILMAZ	Aydın Adnan Menderes University, Türkiye
DETERMINATION OF THE GENETIC DIVERSITY STATUS OF CAUCASIAN, BLACK SEA AND CAUCASIAN X BLACK SEA HYBRID HONEY BEE POPULATIONS WHICH ARE BRED FOR HYGIENIC BEHAVIOR USING MICROSATELLITE MARKERS	Fatih BİLGİ Levent MERCAN	Ondokuz Mayıs University, Türkiye
MOLECULAR CONTROL OF HYGIENIC BEHAVIOR AGAINST DISEASES AND PARASITES IN HONEY BEES (Apis mellifera L.)	Fatih BİLGİ Levent MERCAN	Ondokuz Mayıs University, Türkiye
SELECTION OF EFFECTIVE PARASITOIDS FOR THE BIOLOGICAL CONTROL OF POTATO TUBER MOTH	Emine KAYA Hatice Kübra ÖZMEN Cem ÖZKAN	Ankara University, Türkiye
LEAN PRODUCTION IMPLEMENTATION IN THE PRODUCTION OF CONSTRUCTION MACHINERY PARTS THROUGH VALUE STREAM MAPPING	Erkan Sami KÖKTEN Beyza Koç	Karabük University, Türkiye
SMED METHODOLOGY AND TAGUCHI EXPERIMENTAL DESIGN: AN APPLICATION IN THE PLASTIC INDUSTRY	Erkan Sami KÖKTEN Nida TOPUZ Zeyneb Beyza KILIÇ	Karabük University, Türkiye
ENERGY-EFFICIENT RTOS DESIGNS AND POWER MANAGEMENT STRATEGIES	Hüseyin Cem Koç Mustafa Engin	Ege University, Türkiye
NEW APPROACHES IN BEEHIVE SENSORING AND MONITORING	Ekin VAROL Banu YÜCEL Gamze ERTEM	Ege University, Türkiye
APITHERAPEUTIC PROPERTIES OF BEE VENOM IN HUMAN AND ANIMAL HEALTH	Ekin VAROL Banu YÜCEL	Ege University, Türkiye
SYNTHESIS AND CAHARACTERIZATION OF ARABINOSE COUMARIN AND THEIR SCHIFF BASE DERIVATIVES	Fatma ÇETİN TELLİ Ebru SARIOĞLU Yeşim SALMAN	Ege University, Türkiye

FACE TO FACE (HALL- Z10)

12.06.2023

Moderator: Norboboeva Risolat Botirovna

Address: Ege University, Faculty of Fisheries

Ankara Local Time: 14:30 – 16:30

TITLE	AUTHOR(S)	AFFILIATION
POSSIBILITIES OF APPLICATION OF INNOVATIVE TECHNOLOGIES IN CHEMICAL EDUCATION	Kuchkarov Mexriddin Asamovich Mamadalieva Nodira Isakovna	Tashkent State Pedagogical University named after Nizami, Faculty of Natural Sciences, Tashkent, Uzbekistan
CHANGES IN THE CONTENT OF PHOSPHOLIPIDS AND THEIR FRACTIONS IN CARDIAC TISSUE IN SUBCOMPENSATED AND DECOMPENSATED HYPOBARIC HYPOXIA	Mamadalieva Nodira Isakovna	Tashkent State Pedagogical University named after Nizami, Faculty of Natural Sciences, Tashkent, Uzbekistan
PROGRAM EVALUATION OF THE ENTERPRISE EXPLOTATION SERVICE PROCESS	Umirov Ilkhomjon Umirova Gulmira	Jizzakh Polytechnic Institute, Jizzakh, Uzbekistan
PROSPECTS FOR THE USE OF A COMPLEX ADDITIVE FOR CERAMIC SLICK	Khakimova Gulnoz Nigmanovna	Tashkent Chemical-Technological Institute,Tashkent, Uzbekistan
BIOLOGICAL TREATMENT AND SYSTEMATIC ANALYSIS OF WASTE WATER OF OIL AND INSTALLATIONS OF COMBINED OIL TREATMENT	Norboboeva Risolat Botirovna	Tashkent State Pedagogical University named after Nizami, Tashkent, Uzbekistan
OBTAINING GLASSY MATERIALS FROM MINERAL RAW MATERIALS OF UZBEKISTAN AND INDUSTRIAL WASTE	Tukhtamushova Anisakhon Yunusov Mirjalil	Tashkent Institute of Chemical Technology, Tashkent, Uzbekistan
2-PHENYL-3-BUTYN-2-OL SYNTHESIS BASED ON ACETYLENE AND METHYL PHENYL KETONE	Yusupova Lola Azimovna Igamkulova Nargisa Abduvaliyevna	Tashkent Chemical - Technological Institute, Uzbekistan, Tashkent

Session -1 / Hall-4
12.06.2023
Moderator: Dr. Raja Mohammad Latif
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 10:00 – 12:00

TITLE	AUTHOR(S)	AFFILIATION
ORIGIN OF RASHBA SPIN SPLITTING EFFECT IN HETEROSTRICTURES	Loubna Melaab	Farhat Abbas University, Faculty of sciences, Department of Physics, Setif, Algeria
g**β–Compact and g**β–Lindelof Topological Spaces	Dr. Raja Mohammad Latif	Prince Mohammad Bin Fahd University, Kingdom of Saudi Arabia
g^β–Continuous and g^β–Irresolute Mappings in Topological Spaces	Dr. Raja Mohammad Latif	Prince Mohammad Bin Fahd University, Kingdom of Saudi Arabia
STABILIZATION OF SEMI-LINEAR SYSTEMS ON A HILBERT STATE SPACE	Ayoub CHEDDOUR, Abdelhai EL AZZOUZI	University of Sidi Mohamed Ben Abdellah-USMBA
UNIQUE DIVISION METHOD FOR CALCULATING CUBE ROOT OF A REAL NUMBER	Anupam Khanna	DAV College-Sadhaura, Yamunanagar, Haryana, INDIA
POWERING THE FUTURE: THE SMART ENERGY REVOLUTION SMART ENERGY MANAGEMENT SYSTEM	KOMAL DUBEY RAMYA NT HARINI B NIVETHA M	R.M.K. ENGINEERING COLLEGE
TECHNO-ECONOMIC FEASIBILITY ANALYSIS OF GRID-CONNECTED PV SYSTEM STUDY UNDER NORTH-WEST ALGERIAN CLIMATE CONDITIONS	Hocine Mammeur Djamel Belatrache Abdeldjalil Djouahi Chouaib Ammari Amar Rouag Abdelkader Harrouz	Kasdi Merbah University, Ouargla, Algeria Adrar University, Adrar, Algeria
A NEW FINITE DIFFERENCE SCHEME FOR SOLVING TRANSMISSION LINE EQUATIONS IN A CLASS OF DISCONTINUOUS FUNCTIONS	Bahaddin SINSOYSAL Mahir RASULOV Ethem Ilhan SAHIN	Istanbul Gedik University, Turkey Institute of Oil and Gas of ANAS, Azerbaijan Adana Alparslan Türkes Science and Technology University, Turkey

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Every presentation should last not longer than 10-12 minutes.
Kindly keep your cameras on till the end of the session.

Session -1 / Hall-5
12.06.2023
Moderator: Dendouga Imane
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 10:00 – 12:00

TITLE	AUTHOR(S)	AFFILIATION
THE SENSORY EFFECT OF CINNAMON	Mebarki Amani Hayat, Benaissa Yamina, Addou Samia	University Ahmed Ben Bella Oran
TO REMOVE INORGANIC AQUEOUS EFFLUENTS, LOW-COST BIO ADSORBENTS ARE USED	Djellouli Amir, Berredjem Yamina, Hattab Zhour, Khechai Mohamed, Guesmia Hadjer, Azri Naima, Sara Ncibi	Université mohammed chérif mesaadia de Souk-Ahras, Algeria University of soukahras, Algeria Badji Mokhtar-Annaba University, Algeria. University of Biskra, Algeria Center for Scientific and Technical Research on Arid regions CRSTRA, Algeria Laboratory of Physics of Matter and Radiation (LPMR) INSTITUT NATIONAL AGRONOMIQUE DE TUNISIE, Tunisie
COMPARISON OF ORDINARY AND UNIVERSAL KRIGING INTERPOLATION TECHNIQUES USING GSTAT	Dendouga Imane Messameh Abdelhamid	University Mohamed Khider, Biskra, Algeria
NUMERICAL PREDICTION OF THE DAMAGE DUCTILE OF THE STRUCTURE UNDER TENSILE LOADING	Benchaib Nadia, Mechab Belaïd, Mokadem Salem, Haddou Yagoubia Marwa	University of Sidi Bel Abbes, Algeria
EFFECTS OF ZINC OXIDE NANOPARTICLES ON GROWTH, CARCASS AND NUTRIENT DIGESTIBILITY IN MORI, CIRRHINUS MRIGALA, FINGERLINGS	Adan Naeem, Syed Makhdoom Hussain, Danish Riaz and Eman Naeem	Government College University, Faisalabad, Pakistan
EFFECTS OF IRON OXIDE NANOPARTICLES ON GROWTH TRAITS, BODY COMPOSITION AND BLOOD INDICES IN CYPRINUS CARPIO FINGERLINGS	Eman Naeem, Syed Makhdoom Hussain, Danish Riaz and Adan Naeem	Government College University, Faisalabad, Pakistan
PARTICLES MOTION THROUGH URINE FLOW DRIVEN BY ELECTROOSMOSIS	Daya Ram, D. S. Bhandari, Dharmendra Tripathi, Kushal Sharma	Malaviya National Institute of Technology Jaipur, India University of Glasgow, UK

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Session -2 / Hall-4
12.06.2023
Moderator: Assist. Prof. Dr. Nazım KUNDURACI
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 12:30 – 14:30

TITLE	AUTHOR(S)	AFFILIATION
INVESTIGATION THE ROLE OF CERIUM IN THE STRUCTURE OF FERRITE TITANATE CATALYST FOR IMPROVED PHOTO-FENTON CATALYTIC EFFICIENCY	Esra BİLGİN SİMSEK Özlem TUNA	Yalova University, Türkiye
INVESTIGATION OF THE EFFECTS OF DIFFERENT FILLING MATERIALS ON THE MECHANICAL PROPERTIES OF FOAM CONCRETES	Nazım KUNDURACI	Zonguldak Bülent Ecevit University, Türkiye
INVESTIGATION OF CHANGE IN THE RADIATION ARMOR PROPERTIES OF COLEMANITE REINFORCED POLY (METHYL METHACRYLATE) BUILDING EXPOSED TO SPACE RADIATION	Atilla Volga ŞENGÜL Nilgun BAYDOGAN	Istanbul Technical University, Türkiye
SELECTING THE PARAMETERS THAT MINIMIZE THE ANGULAR DISTORTION IN THE WELDING PROCESS WITH THE ENTROPY METHOD WITHIN THE SCOPE OF MULTI-CRITERIA DECISION MAKING	Ezgi DOĞAN Ahmet FEYZİOĞLU Hüseyin HALİLOĞLU	Marmara University, Türkiye
EXPERIMENTAL INVESTIGATION OF BURNER AIR-FUEL INLET OF A WALL-HANG GAS-FIRED HEATING APPLIANCE USING PARTICLE IMAGING VELOCIMETRY	Utku Alp YÜCEKAYA Dilek KUMLUTAŞ Özgün ÖZER Hasan AVCI	Dokuz Eylül University, Türkiye University of Manchester, United Kingdom
INVESTIGATION OF ADDITIVE MANUFACTURING OF LATTICE STRUCTURES WITH HYBRID UNIT CELL	Hüseyin KIRATLI Elmas SALAMCI	Gazi University, Türkiye
PROJECT EVALUATION AND REVIEW TECHNIQUE (PERT) APPLICATION IN DEFENSE INDUSTRY PROJECT PRODUCTION	Prof. Dr. Cevriye TEMEL GENCER Mahide Begüm ÇİÇEK ASLAN	Gazi University, Türkiye
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Session -2 / Hall-5
12.06.2023
Moderator: BENNOUD Salim
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 12:30 – 14:30

TITLE	AUTHOR(S)	AFFILIATION
THEORETICAL STUDY OF MECHANISM FOR REMOVAL OF ENVIRONMENTAL HEAVY METALS FROM WASTEWATER USING AN EFFICIENT HYBRID MATERIAL	Morad Lamsayah Mohamed El-Massaoudi	Université Mohamed Premier, Morocco
USE LOW-COST BIO ADSORBENTS FOR HEAVY METAL REMOVAL INORGANIC COMPOUND	Djellouli Amir Berredjem Yamina Hattab Zhour Guesmia Hadjer Barbari Fateh Azri Naima Sara Ncibi	Université mohammed chérif mesaadia de Souk-Ahras, Algeria Laboratory for Water and Environmental Sciences and Technology, University of soukahras, Algeria Badji Mokhtar-Annaba University, Algeria. Department of industrial Chemistry, University of Biskra, PO Box 145, Biskra, 07000, Algeria Center for Scientific and Technical Research on Arid regions CRSTRA, Biskra, 07000, Algeria Laboratory of Physics of Matter and Radiation (LPMR) INSTITUT NATIONAL AGRONOMIQUE DE TUNISIE, Tunisie
ANALYTICAL OPTIMAL DESIGN OF NON-CONVENTIONAL TUNED MASS DAMPER WITH NEGATIVE STIFFNESS FOR IMPROVED EFFICIENCY OF STRUCTURAL VIBRATION CONTROL	Okba ABID CHAREF Mayada BOUAOUN	Ecole Nationale Polytechnique de Constantine, Algeria University of CONSTANTINE3 SALAH BOUBNIDER, Constantine, Algeria.
IMPLEMENTATION OF A SENSORLESS PREDICTIVE DTC-SVM OF AN INDUCTION MOTOR WITH A NEW MRAS OBSERVER	Mohamed Chebaani Ahmed Marouane Ghodbane Amar Goléa Med Toufik Benchouia Noureddine Goléa	Biskra University, Algeria
SENSORLESS CONTROL METHOD FOR BLDC MOTOR	ALILI Zakaria Ghadban Ismail Bouzidi Riad	University of Msila, Algeria
ALGORITHM FOR SOLVING THE MOTION'S TYPE OF THE BOLTED BEAM	CHEKIROU Fatine BRAHIMI Khaled	Université des Sciences et de la technologie Houari Boumediene, Faculty of Mechanical Engineering and Process Engineering, mechanical and production

		construction departement, Algiers 16111, Algeria.
ANALYSIS OF THE VARIATION OF AMBIENT AIR PARAMETERS ON THE GAS TURBINE OUTPUT	BENNOUD Salim	Université de BLIDA 1 (SAAD DAHLAB)
A FRACTIONAL ORDER BASED ADAPTIVE SYNCHRONIZATION OF CHAOTIC SYSTEM WITH UNKNOWN PARAMETERS	Mohsen Mohamed Hadji, Samir Ladaci	National Polytechnic School of Algiers, Constantine, Algeria.
CORRELATION OF ULTRASOUND PARAMETERS BY PRINCIPAL COMPONENT ANALYSIS (PCA)	Pr. Mourad DERRA	Ibn Zohr University, Agadir, Morroco
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Session -3 / Hall-3
12.06.2023
Moderator: Prof. Dr. Taner BAYSAL
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 15:00 – 17:00

TITLE	AUTHOR(S)	AFFILIATION
DEVELOPMENT AND CHARACTERIZATION OF BLACK CUMIN CAKE REINFORCED BIOCOMPOSITES FOR ECO-FRIENDLY APPLICATIONS	Müslüm ALTUN	Adıyaman University, Türkiye
THE INVESTIGATION OF BIODEGRADATION OF MICROPLASTICS AND EVALUATION OF EXTRACTION PROCESSES	Ceyhun AKARSU Habibe Elif GÜLŞEN AKBAY	İstanbul Üniversitesi-Cerrahpaşa, Türkiye Mersin University, Türkiye
WATER FOOTPRINT AND INDUSTRIAL WATER CONSERVATION WITH SUSTAINABLE DEVELOPMENT GOALS: A RESEARCH ON THE COLD MILLING - GALVANIZING INDUSTRY	Tamer Çankaya Ceyhun AKARSU Tuğba ÖLMEZ-HANCI	İstanbul Teknik University, Türkiye Borçelik Çelik Sanayii Ticaret A.Ş., Türkiye
TEMPERATURE STRESS, NUTRITIONAL REQUIREMENTS AND NUTRITION APPLICATIONS AGAINST STRESS IN POULTRY	Esra GÜRSOY Tugay AYAŞAN	Ağrı İbrahim Çeçen University, Türkiye Osmaniye Korkut Ata University, Türkiye
PULSED LIGHT (HIPL) AND ULTRAVIOLET (UV-C) APPLICATIONS ON GREEN VEGETABLES FOR MICROBIAL DECONTAMINATION	Zeynep SİNANGİL Taner BAYSAL	Ege University, Türkiye
SPATIO-TEMPORAL ANALYSIS OF LANDSCAPE DYNAMICS: THE CASE OF SELCUK, IZMIR, TURKIYE	Kübra KURTŞAN Can SAYGINER Diba ŞENAY Engin NURLU	Ege University, Türkiye
EVALUATION OF THE APPLICABILITY OF THE WASHING PROCESS IN HEAP LEACHING AREAS IN GOLD MINING	Selahattin GÜNEY Şükrü TANER AZGIN	Erciyes University, Türkiye
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Session -3 / Hall-4
12.06.2023
Moderator: Assist. Prof. Dr. Berna AKSOY
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 15:00 – 17:00

TITLE	AUTHOR(S)	AFFILIATION
INVESTIGATION OF DISASTER SUSCEPTIBILITY WITHIN THE SCOPE OF URBAN PLANNING: MENTEŞE DISTRICT (MUĞLA)	Kübra ALĞIN DEMİR Mercan EFE GÜNEY	Dokuz Eylul University, Türkiye
EFFECT OF BED MATERIAL CHANGE ON FLOW RATE IN RECTANGULAR CHANNELS	Berna Aksoy Dilek Cansu Bozacıoğlu	Zonguldak Bülent Ecevit University, Türkiye
INVESTIGATION OF SETTLEMENT BEHAVIORS OF LOW PLASTICITY FINE GRAINED SOILS – ZONGULDAK EXAMPLE	Dilek Cansu Bozacıoğlu Emrah Dağlı	Zonguldak Bülent Ecevit University, Türkiye
INVESTIGATION OF STIFFNESS ON THE RESPONSE OF HIGH MODULUS COLUMNS UNDER LATERAL LOADING CONDITIONS	Abdulhai Nafea MHMOOD Pelin TOHUMCU ÖZENER	Yildiz Technical University, Türkiye
NUMERICAL INVESTIGATION OF THERMAL PERFORMANCE OF THE INTERNALLY CHANNELS TYPE OF THE FINNED TUBE HEAT EXCHANGER USED FOR CONDENSING WALL HANG HEATING APPLIANCE	Hasan AVCI Dilek KUMLUTAŞ Özgün ÖZER Utku Alp YÜCEKAYA	Dokuz Eylül University, Türkiye The University of Manchester, Department of Mechanical, Aerospace and Civil Engineering, Manchester, United Kingdom
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Session -3 / Hall-5
12.06.2023
Moderator: AJAYDESOUZA V
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 15:00 – 17:00

TITLE	AUTHOR(S)	AFFILIATION
STUDIES OF MACRO AND MICRO FERTILIZERS INFLUENCE ON MULBERRY GROWTH, QUALITY PARAMETERS AND NUTRIENT UPTAKE	Devamani.M, Dahira Beevi. N	Periyar University, India
ROLE OF MYCOVIRUS IN PLANT PATHOLOGY	VIGNESH K MANIKANDAN K SUNIL SURIYA M SATHIYA ARAVINDAN V AJAYDESOUZA	Annamalai University
INVESTIGATE THE EFFECT OF ENVIRONMENTAL CONDITIONS ON SOIL-BORNE Macrophomina phaseolina AND THEIR ABILITY TO INFECT PLANTS, SUCH AS SOIL MOISTURE, TEMPERATURE, AND pH.	AJAYDESOUZA V	Annamalai university
SURVEY OF LITTLE LEAF OF BRINJAL (Candidatus Phytoplasma) IN DIFFERENT VILLAGES OF CUDDALORE AND CHENGALPATTU DISTRICT	Lokesh R Sundaramoorthy S Vignesh K Sathiya Aravindan V Ajaydesouza V	Annamalai University
COMPARATIVE EFFICACY OF MEDIUM SUPPLEMENT ASCORBATE AND THIOUREA ON THE HEAT TOLERANCE OF WHEAT	Ayesha IJAZ Kabeer Ahmed Hafiz Qadeer AHMED	University of Agriculture, Faisalabad, Pakistan. University of Central Punjab, Pakistan
ANTI- OXIDANT ACTIVITIE OF EXTRACTS FROM Ocimum basilicum L and Artemisia campestris A	Dr.Yassmine CHENNAI Dr.Assma FETTEH	Mohamed Khaidhar University, Biskra
THE EFFECTIVENESS OF WHEAT STRAW AND OTHER PLANTS ON THE MORPHOLOGY AND PRODUCTIVITY OF AGARICUS BISPORUS	Ajaydesouza V Sathiya Aravindan V Lokesh R Vignesh K	Annamalai University
PRODUCTION OF ORNAMENTAL PLANTS USING EARTHWORM-BASED ORGANIC FERTILIZER (VERMICOMPOST) CONTAINING BACTERIA: SUSTAINABLE AGRICULTURE PRACTICES	Saiqa Andleeb, Iram Liaqat, Irsa Shafique, Shaukat Ali	University of Azad Jammu and Kashmir,Pakistan Government College University, Lahore, 54000, Pakistan.
APPLICATION OF VEGETABLE TANNIN IN LEATHER PROCESSING EXTRACTED FROM ACACIA NILOTICA L.	Al Mizan Çiğdem Kılıçarislan Özkan Bahri Başaran Oğuz Bayraktar	Ege University, Turkey

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Session -1 / Hall-4
13.06.2023
Moderator: Assist. Prof. Dr. Dilşad ENGİN
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 10:00 – 12:00

TITLE	AUTHOR(S)	AFFILIATION
DESIGN AND IMPLEMENTATION OF MICROCONTOLLER BASED PI CONTROLLER FOR BUCK CONVERTER	Mehmet Akif ÇÖKREN Dr. Tarık ERFİDAN	Kocaeli University, Türkiye
PREDICTING OCCUPANCY RATE IN PUBLIC TRANSPORTATION SYSTEMS USING AIR POLLUTION DATA	Seren ÇARIKCI Bekir ÖZYURT Mehmet Burak AYDIN	Kent Kart Ege Elektronik San. Tic. A.Ş / R&D Center, İzmir, Turkey
EXPERIMENTAL STUDY OF BIFACIAL SOLAR PHOTOVOLTAIC SYSTEMS IN SNOWY ENVIRONMENTS	Hasan Hüseyin ÇOBAN	Ardahan University, Türkiye
WELDING ROBOT AXIAL REPEATABILITY TESTS AND VALIDATION STUDIES	Halil Tolga AYVALI Hamdi TAPLAK	Erciyes University, Türkiye
GREEN LIGHT OPTIMAL SPEED ADVISORY (GLOSA) SYSTEM FOR INTELLIGENT CONNECTED VEHICLES	Şahap Okan KISA Esin YAVUZ	Süleyman Demirel University, Türkiye
IMAGE-BASED NAVIGATION AND LOCALIZATION FOR MOBILE MULTI-ROBOTS IN DYNAMIC ENVIRONMENT	Serkan PINAR Dilşad ENGİN	Ege University, Türkiye
SECURITY ISSUES IN CLOUD TECHNOLOGIES	Raqsana Hamidova	Baku Engineering University

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Session -1 / Hall-5
13.06.2023
Moderator: Subhashish Dey
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 10:00 – 12:00

TITLE	AUTHOR(S)	AFFILIATION
IN SOIL SAMPLES CONTAMINATED WITH PESTICIDES	Konul Gahramanova Aygun Almammadova Tarana Ibragimova Gulzar Mammadova	Ministry of Science and Education Institute of Additives of Chemistry named after acad. A.M.Kuliev, Azerbaijan
BaHPO4 DEPOSITED ON DIFFERENT SUBSTRATES FOR THE ELECTRO-DEGRADATION OF RHODAMINE B	Ayoub AHDOUR, Ali AIT BAHA, Aziz TAOUFYQ, Latifa ANEFLOUS, Abdeljalil BENLHACHEMI, Bahcine BAKIZ	Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco.
AIR, SOIL AND NOISE POLLUTION IN THE OIL INDUSTRY, A CASE STUDY OF THE FULA AND AL-JECKE FIELDS IN WEST KORDOFAN STATE, SUDAN	Adam Abdelsamad	Baku State University, Baku, Azerbaijan
DIVERSIFIED LIVELIHOOD, FLORISTIC INVENTORY, AND ECOLOGICAL CHARACTERISTICS OF NEWLY MERGED DISTRICT KURRAM	Farhan Ahmad Dr. Ristina Siti Sundari Ali Sher	The University of Padjadjaran, Indonesia
WAYS OF REDUCING FRESHET PROCESSES BY THE TECHNOLOGY OF ANTI-EROSIONAL IRRIGATION	Vakhtang Nanitashvili	Georgian Technical University, Tbilisi, Georgia
STUDY OF THE RELATION BETWEEN THE CONCENTRATION OF SEDIMENTS IN SUSPENSION AND THE LIQUID FLOW AT THE HYDROMETRIC STATION M'CHOUNECHE ON OUED L'ABIOD BISKRA	Debabeche Bouthaina Benkhaled Abdelkader Debabeche Kaouther	Mohamed Khider University, Algeria University of Liege, Belgium
DIVERSITY OF PLANT GENETIC RESOURCES IN THE EASTERN ZAB OF THE WILAYAH OF BISKRA	Debabeche Kaouther Debabeche Bouthaina	Scientific and Technical Research Center on Arid Regions, Algeria Mohamed Khider University
DEGRADATION OF PLASTICS WASTE EFFECTS ON THE ENVIRONMENT: A SCIENTIFIC REVIEW	Subhashish Dey	Gudlavalleru Engineering College, Gudlavalleru, Andhra Pradesh, India
DAM BREAK ANALYSIS AND ITS IMPACT IN GURARA WATERSHED UNDER VARIED LAND-USE AND CLIMATE CONDITIONS	Al-Amin Danladi Bello; Abdullahi Sule Argungu; Aminu Tijjani Soron Dinki, Aliyu Bamaiyi Usman; khalid Sulaiman; Abdulrazaq Salaudeen	Ahmadu Bello University, Zaria-Nigeria Abubakar Tafawa Balewa University-Bauchi-Nigeria
APPLICATION OF GEOGRAPHIC INFORMATION SYSTEM FOR SOLID WASTE MANAGEMENT IN CITY	Subhashish Dey	Gudlavalleru Engineering College, India

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Session -2 / Hall-4
13.06.2023
Moderator: Dr.Elif KOZAN
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 12:30 – 14:30

TITLE	AUTHOR(S)	AFFILIATION
U.S. BANKNOTES RECOGNITION BY SURF FEATURES	Mashar Cenk GENÇAL	Ardahan University, Türkiye
GOVERNANCE IN TECHNOLOGY AND AN APPLICATION FROM THE FINANCIAL TECHNOLOGY SECTOR	Kübra Köseoğlu	Harran University, Türkiye
ESTIMATION OF BUILDING HEIGHT FROM ICESat-2/ATLAS AND AIRBORNE LiDAR DATA USING MACHINE LEARNING ALGORITHMS	Müge AĞCA Aslıhan YÜCEL Ali İhsan DALOĞLU Efdal KAYA Mevlüt YETKİN Femin YALÇIN KÜÇÜKBAYRAK	İzmir Kâtip Çelebi University, Türkiye
PREDICTION OF BRAIN TUMOR FROM MAGNETIC RESONANCE IMAGES USING CONVOLUTIONAL NEURAL NETWORK	Rukiye UZUN ARSLAN Ceren KAYA İrem ŞENYER YAPICI	Zonguldak Bülent Ecevit University, Türkiye
OPTIMIZERS COMPARISON OF COVID-19 PREDICTION PERFORMANCES USING CHEST X-RAY IMAGES	Ceren KAYA Tuğba PALABAŞ	Zonguldak Bülent Ecevit University, Türkiye
CHAOTIC WAR STRATEGY OPTIMIZATION ALGORITHM	Muhammed Talha ÇİĞDEM Sinem AKYOL Fatih ÖZYURT	Fırat University, Türkiye
CONTENT ANALYSIS OF E-MENTORING APPLICATIONS IN HIGHER EDUCATION	Deniz GÜNAY Huriye GÖNCÜOĞLU-BODUR	Ege University, Türkiye
NATURAL LANGUAGE PROCESSING VIA TWITTER DATA: SENTIMENT ANALYSIS WITH BERT	Taner SEKMEN Atakan BARIŞ Büşra SAYIN Elif KOZAN	Ege University, Türkiye e
OBTAINING USER-SPECIFIC INFORMATION FROM THE INTERNET VIA TEXT MINING AND MOBILE BASED SYSTEM	Imran GÜL Ferdi SARAÇ	Süleyman Demirel University, Türkiye
A RANDOM NUMBER GENERATION APPROACH FOR INTUITIONISTIC FUZZY REGRESSION ANALYSIS	Tolga BOZDAĞ Ali MERT	Ege University, Türkiye
A NOVEL TOOL TO ENABLE VISUALLY IMPAIRED USERS TO USE THE INTERNET FOR THEIR INVESTMENTS	Ferdi SARAÇ	Süleyman Demirel University, Türkiye
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Session -2 / Hall-5
13.06.2023
Moderator: Dr. Béla Kovács
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 12:30 – 14:30

TITLE	AUTHOR(S)	AFFILIATION
IOT BASED SMART LOCK DOOR SYSTEM USING RASPBERRY PI	Dhulasiraman M, Rahul D, Arshath Ahamed H, Dr. P .S LATHAMAHESHWARI, Dr.S.RAMYA, Dr.P.Radhika	R.M.K Engineering college, Kavaraipettai-601206, India
THE ROLE OF ARTIFICIAL INTELLIGENCE IN DISEASE DIAGNOSIS AND TREATMENT	Nishant K. Singh, Yashvir Singh, Virendar Kumar, Rajesh Kumar Verma	Harcourt Butler Technical University, Kanpur, UP, India Graphic Era Deemed to be University, Dehradun, Uttarakhand, India
INVESTIGATION ON SOLAR PV DEFECTS BY USING ARTIFICIAL INTELLIGENCE AND DEEP LEARNING	Alhassan Issah Fofana Assist. Prof. Dr. Vedat Öztürk	Istanbul Aydin University, Istanbul, Turkiye
PROXIMAL POLICY OPTIMIZATION WITH CURRICULUM LEARNING FOR ENHANCED PATH PLANNING IN SWARM ROBOTICS	ALAA ISKANDAR, Dr. Béla Kovács	University of Miskolc, Faculty of Mechanical Engineering and Informatic
HOME VISION AI BASED HOUSE PRICE FORECASTING	Mohd Faizaanuddin Afrah Fathima Mohammed Affanuddin	CBIT College (Osmania University), M.tech Student, Department of Artificial Intelligence and Data Science
IMPLEMENTATION OF A SENSORLESS PREDICTIVE DTC-SVM OF AN INDUCTION MOTOR WITH A NEW MRAS OBSERVER	Mohamed Chebaani, Ahmed Marouane Ghodbane, Amar Goléa, Med Toufik Benchoui, Noureddine Goléa	LGEA laboratory, Oum El Bouaghi University, Algeria.
BLOCKCHAIN TECHNOLOGY IN HEALTHCARE AND REAL ESTATE	Arijan Muslijevic Muzafer Mollazeqiri Erjon Coba Ersan Hamdiu	AAB College, Computer Science, Cyber security, Prishtine, Kosova
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Session -3 / Hall-3
13.06.2023
Moderator: Ugochukwu Okechukwu Ozojiofor
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 15:00 – 17:00

TITLE	AUTHOR(S)	AFFILIATION
FUNGI LACCASES: STRUCTURE, FUNCTIONS, AND POTENTIAL APPLICATION IN THE BIODEGRADATION OF PHARMACEUTICAL MICROPOLLUTANTS	Ugochukwu Okechukwu Ozojiofor, Mohammed Sani Abdulsalami, Nkechi Eucharia Egbe and Ahmed Ali Haroun	Nigerian Defence Academy, Kaduna, Nigeria.
ISOLATION AND CHARACTERIZATION OF KERATIN-DEGRADING BACTERIA FROM SOME CHICKEN SLAUGHTERHOUSES IN KADUNA	Ugochukwu Okechukwu Ozojiofor, Uchenna Bob Odurukwe	Nigerian Defence Academy, Kaduna, Nigeria.
STUDY OF SOME CHEMICAL AND BIOCHEMICAL PARAMETERS OF POMEGRANATE BARK GROWN IN GHRADIA (ALGERIA)	BENAISSA Yamina, Djelled djihen, ADDOU Samia	University Ahmed Ben Bella Oran
SYNTHESIS OF WURTZITE PHASE ZnO NANOPARTICLES USING COMBUSTION METHOD AND COMPUTATIONAL STUDIES	Samy mansy Hussam Musleh Sami Shaat Jihd Asad naji AlDahoudi	University collage of Science and Technology, Department of Engineering Sciences and Applied Arts, Palestine Al Azhar University-Gaza, Physics Department, P.O. Box 1277, Gaza, Palestine
ANTIOXIDANT PROPERTIES OF FIVE *LACTOBACILLUS PLANTARUM* STRAINS AS PROBIOTICS	Manel Sebouai	University of Bejaia, Faculty of Nature and Life Sciences, Department of Physical Biology and Chemistry , Bejaia, Algeria
DISPERSION CHARACTERIZATION OF OPTICAL FIBER IMPAIRMENTS IMPACT ON SINGLE MODE OPTICAL FIBER COMMUNICATION SYSTEMS	Sani Abdullahi Muhammad Ishaq Bala Adam Sani Ahmad Muhammad Sani Sale Yakubu Umar Alhassan Umar	Kano State Polytechnic, Kano State, Nigeria
EFFECT OF CLAY CONCENTRATION ON MORPHOLOGY AND PROPERTIES OF POLY (VINYL ALCOHOL) FILMS	Imane ABBOU, Abdelmajid BELKHODJA, Souhila GUENDOUZ, Amal BENKHALED, Fatima El BERRICHI, Esma CHOUKCHOU-BRAHAM	Laboratoire de Recherche Toxicomed, Université Abou Baker Belkaid, BAlgérie. Laboratoire de Chimie Physique, Université de 8mai45, BP 401, Algérie
NiO SYNTHESIS, ELECTROCHEMICAL AND OPTICAL PROPERTIES	Marilena Carbone	University of Rome Tor Vergata, Department of Chemical Science and Technologies, Rome Italy

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Session -3 / Hall-4
13.06.2023
Moderator: Assist. Prof. Dr. Şükran Melda ESKİTOROS TOĞAY
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 15:00 – 17:00

TITLE	AUTHOR(S)	AFFILIATION
DRUG-LOADED ELECTROSPUN POLYMER/CLAY NANOCOMPOSITES FOR DRUG DELIVERY SYSTEMS	Şükran Melda ESKİTOROS TOĞAY	University of Health Sciences, , Turkey
A NOTE ON SET-VALUED KRASNOSEL'SKII TYPE EQUATIONS	Cesim Temel Müberra Selah	Van Yüzüncü Yıl University, Türkiye
SOME EXISTENCE RESULTS FOR SET-VALUED MAPPINGS WITH GENERALIZED CONTRACTION CONDITION	Cesim Temel Müberra Selah	Van Yüzüncü Yıl University, Türkiye
DESIGN PRINCIPLES FOR MODERN MANUFACTURING METHODS	Tuğçe Tezel Volkan Kovan	Akdeniz University, Türkiye
NUMERICAL ANALYSIS OF THE USAGE OF VEHICLE PISTONS IN ADDITIVE MANUFACTURING	Gülsüm Tekavit Tuğçe Tezel Volkan Kovan	Akdeniz University, Türkiye
DEVELOPMENT OF ORNITHOPTER TECHNOLOGIES	Sait Büyükkaya Volkan Kovan Tuğçe Tezel	Akdeniz University, Türkiye
NATURAL FIBER-REINFORCED COMPOSITE FILAMENT MANUFACTURING	Tuğçe Tezel Volkan Kovan	Akdeniz University, Türkiye
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Session -3 / Hall-5
13.06.2023
Moderator: Taiye Oyedepo
Meeting ID: 852 8194 6857 / Passcode: 121212
Ankara Local Time: 15:00 – 17:00

TITLE	AUTHOR(S)	AFFILIATION
CATALYTIC OXIDATION OF VOCs PRODUCES ALKENE AT SPECIFIC TEMPERATURES BY MESOPOROUS MATERIALS	Boughedir nadia, Bailiche Zohra	Université de Tlemcen BP 119Laboratoire de Catalyse et Synthèse en Chimie Organique, Algérie université de Ain t émouchent laboratoire de chimie ;Algérie
NUMERICAL SOLUTION OF VOLTERRA INTEGRO-DIFFERENTIAL EQUATIONS USING BERNSTEIN POLYNOMIALS	Oluwaseun Biodun Onuoha, Emmanuel Adewale Adenipekun, Zubair Obashola Rufiu, Ibrahim Salihu, Abdullahi Muhammed Ayinde, Taiye Oyedepo	Adekunle Ajasin University, Akungba-Akoko, Nigeria Federal Polytechnic Ede, Odun, Nigeria Kwara State Polytechnic, Ilorin, Nigeria University Abuja, Abuja, Nigeria Federal College of Dental Technology and Therapy, Enugu, Nigeria
STRUCTURAL STUDY OF A MEMBRANE BASED ON CHITOSAN AND HYDROXYETHYL CELLULOSE	Nassima CHEKROUN Houcine Ziani Cherif	Abou Bekr Belkaid University, Faculty of Sciences, Departement of chemistery, Tlemcen, Algeria
THE DUAL ION CONDUCTING SOLID OXIDE FUEL CELLS	Sarah Guenou Dr Ali Chenane Dr. Naceur Selman	Amar Thlidji University, Laghouat, Algeria
THERMAL AND CONCENTRATION STRATIFICATION EFFECTS OF BIOCONVECTIVE WILLIAMSON FLUID FLOW CONSISTING TINY PARTICLES WITH GYROTACTIC MICROORGANISMS	Ephesus O. Fatunmbi, Olumuyiwa A. Agbolade	Federal Polytechnic, Ilaro, Nigeria
STUDY OF THE MECHANICAL PROPERTIES AND THE BOND STRENGTH OF SISAL FIBER-REINFORCED SELF-COMPACTING REPAIR MORTAR BASED IN DUNE-LIMESTONE SAND	Krobba Benharzallah Djamed Anfal	Univerity Amar Telidji of Laghouat, Faculty of Civil engineering and Architecure, Departemen of Civil engineering, Laghouat Algeria.
INVESTIGATING THE EFFECTIVENESS OF CRUMB RUBBER AND RICE HUSK ASH IN SUBGRADE SOIL STABILIZATION	Sikander Khan Amir Nawaz Khan	University of Wah, Wah Engineering College, Civil Engineering Department, Taxila, Pakistan
LANTHANUM-MODIFIED BIOCHAR EFFICIENCY TOWARD PHOSPHORUS	Nail Amara, Abdelkader Ouakouak Asma Nouioua Dhirar Ben salem	Hydraulic and Civil Engineering Department, University of El Oued, PO Box 789, El Oued, 39000, Algeria.

		Research Laboratory in Subterranean and Surface Hydraulics, University of Biskra, PO Box 145, Biskra, 07000, Algeria.
STRAIN BASED FINIT ELEMENT FORMULATION FOR THE ANALYSIS OF HOMOGENEOUS PLATES	CHENAFI Madjda, Messaoud BOUREZZANE Taqiyeddine ASSAS	University of Biskra, Science and technology faculty, Civil Engeneering and Hydraulic Department,
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CONTENT

INVESTIGATION THE ROLE OF CERIUM IN THE STRUCTURE OF FERRITE TITANATE CATALYST FOR IMPROVED PHOTO-FENTON CATALYTIC EFFICIENCY

Esra BİLGİN SİMSEK

Department of Chemical Engineering, Faculty of Engineering, Yalova University, 77200 Yalova, Türkiye

ORCID ID: 0000-0002-2207-3855

Özlem TUNA

Department of Chemical Engineering, Faculty of Engineering, Yalova University, 77200 Yalova, Türkiye

ORCID ID: 0000-0003-1641-4155

ABSTRACT

Rapid development of modern technology led an increase in the market demand for semiconductor materials having multiple excellent features. In this work, ferrite titanate ($FeTiO_3$) as a titanate-based perovskite catalyst was modified by using cerium as a rare earth metal in order to enhance its structural, optical and photocatalytic characteristics. It was hypothesized that the incorporation of doping of cerium would be beneficial to improve the photocatalytic efficiency of $FeTiO_3$ through modulating its band gap energy, surface oxygen vacancies as well as increasing redox cycle in photo-Fenton-catalytic reaction. The crystalline phase and the structure of the catalysts were characterized by the X-Ray diffraction analysis (XRD), scanning electron microscopy with energy dispersive spectroscopy (SEM-EDAX) analyses. The band gap energy, light absorption and photoluminescence features were investigated by UV–Visible diffuse reflectance and photoluminescence spectroscopic techniques. The photocatalytic and photo-Fenton catalytic activities of the bare and cerium modified catalysts were examined towards azo dye decolorization under visible light illumination. According to the results, the cerium modified $FeTiO_3$ catalyst displayed higher photocatalytic performance for the sunset yellow degradation in the visible region. Additionally, the cerium incorpartion greatly increased the photodegradation efficiency of the bare perovskite towards decomposition of different dye dye and antibiotic components. The hybrid material also exhibited high stability even after more than seven repeating recycle tests. The plausible degradation mechanism was investigated by scavenging tests. The obtained results strongly testify to the fact that cerium incorporated catalysts have potential as good photocatalytic materials for environmental use.

Keywords: Cerium, Perovskite, Photocatalysis, Degradation

THEORETICAL STUDY OF MECHANISM FOR REMOVAL OF ENVIRONMENTAL HEAVY METALS FROM WASTEWATER USING AN EFFICIENT HYBRID MATERIAL

Morad LAMSAYAH

Laboratory of Applied and Environmental Chemistry (LCAE), Faculté des Sciences, Université Mohamed Premier, 60 000, Oujda, Morocco

Mohamed EL-MASSAOUDI

Laboratory of Applied and Environmental Chemistry (LCAE), Faculté des Sciences, Université Mohamed Premier, 60 000, Oujda, Morocco

ABSTRACT

Heavy metal ions originating from industrial waste represent a real threat and even a danger to the whole ecosystem. Currently, surface adsorption has been identified as the most promising technology for the removal of pollutants from wastewater **[1]**. This study focuses on creating a novel adsorbent based on silica gel as an inert material modified on surface by a pincer ligand. The adsorbent shows an extremely rapid efficiency in removal of copper (less than 8 min) with maximum sorption capacity of 1.90 mmol g−1 and a rapid efficiency for zinc, cadmium and lead (less than 20 min) with adsorption capacities 0.52, 0.49 and 0.43 mmol g−1, respectively. The adsorbent shows a high selectivity to Cu(II) and a great reusability after five adsorption-desorption cycles. Theoretical, energy dispersive X-ray fluorescence (EDX) and Fourier transform-infrared spectroscopy studies demonstrate that the uptake occurs by a coordination reaction between metal ions and the pincer ligand on the surface of the adsorbent. DFT calculations were performed to investigate the electronic structures of hybrid material and the mechanism of adsorption, by calculating the energies and identifying of the coordination sites of the material **[2]**.

Keywords: Hybrid adsorbent material, Silica, Immobilization, Porphyrin, Thiopyridine, Water pollution, Metal ions, Adsorption, DFT.

APPLICATION OF VEGETABLE TANNIN IN LEATHER PROCESSING EXTRACTED FROM *ACACIA NILOTICA L.*

Al MİZAN

Department of Leather Engineering, Faculty of Engineering, Ege University, Bornova, Izmir 35100, Türkiye

Department of Leather Engineering, Khulna University of Engineering and Technology (KUET), Khulna-9203, Bangladesh

Çiğdem KILIÇARİSLAN ÖZKAN

Department of Leather Engineering, Faculty of Engineering, Ege University, Bornova, Izmir 35100, Türkiye

Bahri BAŞARAN

[1]Department of Leather Engineering, Faculty of Engineering, Ege University, Bornova, Izmir 35100, Türkiye

Oğuz BAYRAKTAR

[3]Department of Bioengineering, Faculty of Engineering, Ege University, 35100 Bornova-Izmir, Türkiye

ORCID ID: 0000-0001-8577-9356

ABSTRACT

Vegetable tanning agents are considered the eco-friendly tanning material in the leather industry compared to the conventional chrome tanning method. Different sources of vegetable tannin have drawn attention due to their environmental aspects and naturally availability. An attempt has been taken to extract a competitive vegetable tanning agent from *Acacia Nilotica L.* seeds and pods in this study. Extraction was carried out at 80 ± 2°C temperature and 8 h with water as a solvent by using Koch extractor which resulted in 33% of extraction yield. The average maximum extractable materials from *Acacia Nilotia L.* was found to be 47.1%. Standard hide powder was used to determine the tannin % and non-tannin parts in the extracted materials which revealed 60% of tannin and 20% of non-tannin substances. Competitive result was obtained from 13% (active tannin matter) use of extracted tannin in leather processing. Physical performances of leather tanned with extracted tannin were evaluated. Shrinkage temperature (T_s) of the tanned leather was found to be 76.5 ± 0.5°C. Average tensile strength, elongation, tear strength, and filling co-efficient were noticed as 21.7 ± 0.7 (N/mm^2), 73.3 ± 2 (%), 41.57 ± 2.6 (N/mm), and 62.6 % respectively which strongly fulfill the standard tanned leather properties. From the evaluation of results it is concluded that the extracted tannin from *Acacia Nilotica L.* has a plausible tanning effect and the tanned leather met the standard criteria of vegetable tanned leather compared to the conventional vegetable tanned leather.

Keywords: Vegetable tannin, Leather, Tensile strength, tannin content.

STUDIES OF MACRO AND MICRO FERTILIZERS INFLUENCE ON MULBERRY GROWTH, QUALITY PARAMETERS AND NUTRIENT UPTAKE

DEVAMANI.M

Centre for higher studies in Botany and Sericulture, Periyar University, Vaikkalpattarai, Salem-17, Tamil Nadu, India

Dahira BEEVI. N

Centre for higher studies in Botany and Sericulture, Periyar University, Vaikkalpattarai, Salem-17, Tamil Nadu, India

ABSTRACT

A field experiment was conducted at Regional Sericultural Research Station, Central Silk Board, Salem, Tamil Nadu, India, during 2018-2022 to study the importance of micronutrients and its influence on mulberry growth, moisture, yield parameters and nutrient composition of leaf. Established V1 mulberry variety with 3'×3' spacing garden was selected for the study. There were ten treatments laid out in a randomized block design with three replications. The pooled results showed that the treatment T3 followed by treatment T2 recorded higher no. of branches/plant, no. of leaves/branch, no. of leaves/plant, shoot length(cm), leaf yield and stem yield, (8.07, 21.17, 178.78 and 128.55 cm, 54.84 and 29.59 mt/ha/yr) and (8, 21.13, 173, 127.23cm, 54.45 and 29.50 mt/ha/yr) compared to rest of the treatments. There is no major difference in leaf and stem moisture percentage between the treatments but recorded fairly high in T5 (74.66 to 70.68 %) followed by T7 (74.51 to 70.43 %). Among the ten nutrient levels, T2 recorded significantly higher in percentage of nutrient composition such as N, P, K, Ca, Mg and S (3.48, 0.25, 2.21, 0.51, 0.15 & 0.22 %) same trend observed in micronutrients such as Cu and B (5.11, 101 & 53 ppm) and it were on par with T3 (3.40, 0.25, 2.18, 0.50, 0.15 & 0.22 %) and micronutrients (5.10 & 52 ppm) while Zn, Fe and Mn recorded same value (47, 101 and 124 ppm) in both T2 and T3 respectively. T2 recorded significantly higher in percentage of crude protein, starch, crude fibre and CHO (22, 11.88, 8 & 14.56 %) and it were on par with T3 (21, 11.83, 7.96 & 14.46 %).Among the ten nutrient levels, T2 and T3 recorded significantly higher in total chlorophyll content (3 mg/g) and T10 recorded low in total Chlorophyll (0.31 mg/g) respectively. T2 recorded signif icantly higher in nutrient uptake such as N, Ca, Mg and S (484,73, 22 & 32 kg/ha) and was on par with T3 (474, 72, 21, & 31 kg/ha). While uptake of P and K showed same values (35 & 306 kg/ha) in both the treatments T2 and T3. Micronutrients uptake such as Cu, Zn, Fe, Mn and B recorded high value in T3(73, 666, 1424, 1774 & 743 g/ha) and it was on par with T2 (72, 658, 1400, 1765 & 728 g/ha).

Keywords: V1 mulberry variety, Inorganic fertilizers, Panchagavya, Poshan and macro-micro nutrients.

FUNGI LACCASES: STRUCTURE, FUNCTIONS, AND POTENTIAL APPLICATION IN THE BIODEGRADATION OF PHARMACEUTICAL MICROPOLLUTANTS

Ugochukwu Okechukwu OZOJIOFOR

Department of Biotechnology, Nigerian Defence Academy, Kaduna, Nigeria

ORCID ID: 0000-0001-7829-1045

Mohammed Sani ABDULSALAMİ

Department of Biotechnology, Nigerian Defence Academy, Kaduna, Nigeria

Nkechi Eucharia EGBE

Department of Biotechnology, Nigerian Defence Academy, Kaduna, Nigeria

Ahmed Ali HAROUN

Department of Biotechnology, Nigerian Defence Academy, Kaduna, Nigeria

ABSTRACT

Laccases are a family of oxidoreductases with copper centres found in bacteria, insects, fungi, and plants, and they catalyse the oxidation of a wide range of substrates with the conversion of molecular oxygen to water. They possess immense potential in the degradation of dyes, crude oil, pollutants, phenolic compounds and pharmaceuticals. Fungi laccases have unusual enzyme machinery which enables them to catalyze several complex chemical reactions. Fungi as well as their enzymes have been found to be of immense value in pollution management and control such as peroxidases, tyrosinases, laccases and cytochrome monooxidases. Pharmaceuticals are a broad class of emerging recalcitrant contaminants that have found their way into water bodies through different means and have become a major source of pollution and concerns to pollution management agencies. In this review, we looked at the structure and function of fungi laccases and their potential application in the biodegradation of emerging pollutants like pharmaceuticals used as analgesics, antibiotics, antiepileptic, antihypertensive, antidepressants. antidiabetic and anti-inflammatory drugs. We concluded that laccases hold a lot of promise in their application in degrading pharmaceuticals but there is the need for its application outside the laboratory and translation into large industrial use. Engineering laccases for improved yield and efficiency is another area that can be explored in the degradation of pharmaceuticals micropollutants.

Keywords: Fungi Laccases, Biodegradation, Pharmaceutical Micropollutants, antidiabetic and antiinflammatory drugs

ISOLATION AND CHARACTERIZATION OF KERATIN-DEGRADING BACTERIA FROM SOME CHICKEN SLAUGHTERHOUSES IN KADUNA

Ugochukwu Okechukwu OZOJIOFOR

Department of Biotechnology, Nigerian Defence Academy, Kaduna, Nigeria

Uchenna Bob ODURUKWE

Department of Biotechnology, Nigerian Defence Academy, Kaduna, Nigeria

ABSTRACT

This study was focused on isolating keratinolytic bacteria from soils and determining their ability to degrade keratinous materials using chicken feather as substrate. Keratinase producing bacteria were isolated from soil samples gotten from different chicken slaughterhouses in Kaduna metropolis. The isolated bacteria were screened for keratinolytic ability on chicken-feather agar medium and the keratinolytic bacteria were identified through 16s rRNA gene sequence analysis. The keratinase activity was determined with respect to the percentage whole feather degradation and quantification of soluble proteins produced. The isolated bacteria were identified as *Bacillus spp*. With the keratinase activity and soluble protein ranging from 8.4 ± 0.07U/ml – 18.1 ± 0.02U/ml and 0.014 ± 0.003mg/ml – 0.26 ± 0.003mg/ml respectively. Also, the degree of whole feather degradation ranges from 24% - 82% with the isolated *Bacillus spp*. The pH of the medium increased from 7.2 - 8.6 at 40°c due to the presence of soluble proteins in the medium. The amount of soluble proteins increased with the increase in the percentage feather degradation, which further suggests the possible role of the isolated *Bacillus spp* in the conversion of adamant keratinous wastes into nitrogenous bio-fertilizers and animal feed proteins. Keratinolytic potentials of these isolated bacteria species makes them a very useful biotechnological tool for industrial purposes.

ROLE OF MYCOVIRUS IN PLANT PATHOLOGY

VIGNESH K

Ph. D Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0000-0003-4484-3862

MANIKANDAN K

Ph. D Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0000-0002-0677-0159

SUNIL SURIYA M

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0000-0002-5416-6757

SATHIYA ARAVINDAN V

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University.

ORCID ID: 0000-0002-8556-7801

AJAYDESOUZA

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0009-0006-8526-0742

ABSTRACT

Mycoviruses are viruses that infect fungi but produce latent symptoms in fungi and rarely causing disease in hosts. The genome of mycoviruses mostly consist of double stranded RNA (dsRNA) and least of mycoviruses genome consist of positive, single stranded RNA (ssRNA). Moreover, DNA Mycoviruses have been reported recently. These viruses have been detected in almost all fungal phylum but still most of the mycoviruses remain unknown. Mycoviruses mostly remain silent and rarely develop symptom in their hosts. Some mycoviruses have been reported to cause irregular growth, abnormal pigmentation and some are involved in changing their host sporulation. For the management of Plant diseases, the importance of mycoviruses arises because of their most significant effect that is they cause hypovirulence in their host. “Hypovirulence is simply a pathogen phenotype where virulence is reduced”. Technically the reduced virulence is called hypovirulence. This hypovirulence phenomena has increased importance of mycoviruses because it has the potential to act as biocontrol agent and reduce the crop losses.

Keywords: Mycoviruses, DNA Mycoviruses, Hypovirulence

USE LOW-COST BIO ADSORBENTS FOR HEAVY METAL REMOVAL INORGANIC COMPOUND

Djellouli AMIR

Université mohammed chérif mesaadia de Souk-Ahras, Algeria

Laboratory for Water and Environmental Sciences and Technology, University of soukahras, Algeria

Center for Scientific and Technical Research on Arid regions CRSTRA, Biskra, 07000, Algeria

Laboratory of Physics of Matter and Radiation (LPMR)

ORCID :0000-0001-5092-2212

Berredjem YAMINA

Laboratory for Water and Environmental Sciences and Technology, University of soukahras, Algeria

Badji Mokhtar-Annaba University, Algeria

Hattab ZHOUR

Badji Mokhtar-Annaba University, Algeria

Guesmia HADJER

enter for Scientific and Technical Research on Arid regions CRSTRA, Biskra, 07000, Algeria

Barbari FATEH

[5]Center for Scientific and Technical Research on Arid regions CRSTRA, Biskra, 07000, Algeria

Azri NAIMA

Department of industrial Chemistry, University of Biskra, PO Box 145, Biskra, 07000, Algeria

Sara NCIBI

INSTITUT NATIONAL AGRONOMIQUE DE TUNISIE, Tunisie

ABSTRACT

This study's goal was to synthesize and construct biomaterials of the cationic and anionic types. These substances were utilized as adsorbents in waters that had been contaminated by various adsorbates that were probably prevalent in the environment. In order to describe the various materials, various approaches (IRTF, DRX, MEB, BET, and ATG/DTA) will be used. Studies on the adsorption by these substances will be conducted while changing a number of variables, including pH, mass, concentration, and temperature.

Removal of effluents in aqueous media, particularly the adsorption technique, which appears to be well suited to remove pollutants due to its shown efficacy as well as for financial reasons, using inexpensive adsorbents such agricultural and industrial wastes.

Keywords: Characterization; Different materials; Water treatment; Bio adsorbents; adsorption

INVESTIGATE THE EFFECT OF ENVIRONMENTAL CONDITIONS ON SOIL-BORNE *Macrophomina phaseolina* AND THEIR ABILITY TO INFECT PLANTS, SUCH AS SOIL MOISTURE, TEMPERATURE, AND pH.

AJAYDESOUZA V

Pg Scholar Department of Plant Pathology Faculty of Agriculture, Annamalai university

ORCID ID: 0009-0006-8526-0742

ABSTRACT

Macrophomina phaseolina is a soil-borne fungal disease that can severely damage crops of various crops, including soybeans, cotton and sunflowers. Soil environmental conditions play an important role in the survival and infectivity of pathogens. In this work, we evaluated the effects of soil moisture, temperature, and pH on the growth and infection potential of *M. phaseolina*. We ran a variety of tests to see how different amounts of soil moisture, temperature, and pH *M.phaseolina* Growth, of the throat and the possibility of infection. To assess pathogen response to different environmental conditions, we used different approaches including growth assays, qPCR and inoculation assays. Our results showed that soil moisture, temperature and pH had a significant impact on the development and infective potential of *M. phaseolina*. The pathogen grew in moist soil and developed optimally at a soil moisture content of about 60%. However, we have found that the pathogen can survive and remain infectious for a long time in dry soil. Temperature has a significant impact on the ability of *M. phaseolina* to multiply and infect. The pathogen survived best at temperatures between 30°C and 35°C, but could survive at temperatures between 15°C and 45°C. In addition, the ability of the pathogen to infect plants was reduced at both low (20°C) and high (>40°C) temperature. Finally, we found that soil pH significantly affected the growth and infectivity of *M. phaseolina*. The pathogen thrived in a slightly acidic to neutral pH range (pH 5.5-7.5) but could tolerate pH values as low as 4.5 to 8.5.

APPLICATION OF GEOGRAPHIC INFORMATION SYSTEM FOR SOLID WASTE MANAGEMENT IN CITY

Subhashish DEY

Department of Civil Engineering, Gudlavalleru Engineering College, Andhra Pradesh, India

ABSTRACT

Solid waste management is one of the main issues in the growing areas of the world and severe ecological trouble that should be considered prior to other environmental problems. A certain quantity of waste dumping without appropriate separation has led to financial and environmental problems. Due to straight discarding of waste in and around growing areas there is a lot of environmental problems that cause inconvenience to people staying in that area. There has to be appropriate planning of transfer and waste management. This scheme would deals with, how Remote sensing and Geographical information system is helpful in finding the latest appropriate areas for waste disposal and roads to convey the waste without causing interruption to the community. The suggestion made by applying RS and GIS someway helps to decrease the troubles of solid waste management and it's carrying to the disposal region. It deals with finding the innovative appropriate region for waste disposal and the roads that doesn't create trouble for the solid Waste carrying. The model will be applied on the Gudivada town's case study region data for the study. The results will recommend a few changes in the present systems that are expected to decrease the troubles of solid waste management and its transportation. We take Gudivada town because it is single of the main towns in Krishna District, Andhra Pradesh, India which is in CRDA limits.

Keywords: *Gudivada, Solid Waste, Environmental work, GIS, Disposal and Systems*

CATALYTIC OXIDATION OF VOCs PRODUCES ALKENE AT SPECIFIC TEMPERATURES BY MESOPOROUS MATERIALS

Boughedir NADIA

Université de Tlemcen BP 119Laboratoire de Catalyse et Synthèse en Chimie Organique, Algérie
université de Ain t émouchent laboratoire de chimie ;Algérie

Bailiche ZOHRA

Université de Tlemcen BP 119Laboratoire de Catalyse et Synthèse en Chimie Organique, Algérie
université de Ain t émouchent laboratoire de chimie ;Algérie

ABSTRACT

Ag/SBA-15 is a hybrid material composed of silver nanoparticles (Ag) supported on SBA-15, a mesoporous silica with a high surface area and tunable pore size. This catalyst has been widely studied for its potential applications in various fields, including catalysis, sensing, and drug delivery.

One of the main advantages of Ag/SBA-15 is its high surface area, which allows for high loading of silver nanoparticles and, in turn, increased catalytic activity. This has been demonstrated in several studies, where Ag/SBA-15 was found to have higher catalytic activity than bulk silver or other silver-based catalysts for reactions such as reduction of 4-nitrophenol and oxidation of benzyl alcohol.

Catalytic oxidation of VOCs is a chemical process which hydrocarbons are combined with hydrogen at specific temperatures to produce alkene. Silver was until recently considered one of the least catalytically useful metals due to its chemical inertness. the mesoporous materials containing silver support on SBA15 were synthesized by the method of post-synthesis and direct synthesis

We tested our synthesized materials as catalysts in esterification reactions of fatty acids which is a natural molecule.

Biodiesel is one of the examples of biofuels intended to combine or replace conventional fuels and reduce the pollution produced by those of petroleum origin.

Keywords: Ag/SBA15 ; COV ; matériaux mésoporeux ; fatty acids

SURVEY OF LITTLE LEAF OF BRINJAL (*Candidatus* Phytoplasma*)* IN DIFFERENT VILLAGES OF CUDDALORE AND CHENGALPATTU DISTRICT

LOKESH R

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0009-0003-6040-6758

SUNDARAMOORTHY S

Assistant Professor, Department of Plant Pathology, Faculty of Agriculture, Annamalai University.

ORCID ID: 0000-0002-8556-7801

VİGNESH K

Ph. D Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0000-0003-4484-3862

Sathiya ARAVİNDAN V

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University.

ORCID ID: 0000-0002-8556-7801

AJAYDESOUZA V

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University.

ORCID ID: 0009-0006-8526-0742

ABSRACT

In India as well as other countries, the production of brinjal is seriously threatened by the Little Leaf disease in brinjal caused by *Candidatus* Phytoplasma. This survey study sought to determine the prevalence and severity of the illness in various Cuddalore and Chengalpattu district villages. Visual observations were taken for symptoms including stunted growth, yellowing of the leaves, and limited leaf production on a total of 15 brinjal farms. The findings demonstrated that Little Leaf disease, with a severity range of 20% to 80%, was prevalent in every farm surveyed. It was discovered that Cuddalore district has a greater disease incidence than Chengalpattu district. The majority of farmers were uninformed of the disease and lacked knowledge about effective management techniques, according to a thorough examination of the management practises used by farmers. In conclusion, this survey shows that in order to stop the development of Little Leaf disease in the production of brinjal, farmers need to be made more aware of the disease, given more information about it, and encouraged to use integrated disease management measures.

Keywords: Candidatus Phytoplasma , Little Leaf of Brinjal , survey

DAM BREAK ANALYSIS AND ITS IMPACT IN GURARA WATERSHED UNDER VARIED LAND-USE AND CLIMATE CONDITIONS

Al-Amin Danladi BELLO

Department of Water Resources & Environmental Engineering, Faculty of Engineering, Ahmadu Bello University, Zaria-Nigeria

Abdullahi Sule ARGUNGU

Department of Water Resources & Environmental Engineering, Faculty of Engineering, Ahmadu Bello University, Zaria-Nigeria

Aminu Tijjani Soron DİNKİ

Department of Water Resources & Environmental Engineering, Faculty of Engineering, Ahmadu Bello University, Zaria-Nigeria

Aliyu Bamaiyi USMAN

Department of Water Resources & Environmental Engineering, Faculty of Engineering, Ahmadu Bello University, Zaria-Nigeria

Khalid SULAİMAN

Department of Water Resources & Environmental Engineering, Faculty of Engineering, Ahmadu Bello University, Zaria-Nigeria

Abdulrazaq SALAUDEEN

Department of Civil Engineering, Faculty of Engineering, Abubakar Tafawa Balewa University-Bauchi-Nigeria

ABSTRACT

This study focuses on the flood disaster and risk that can potentially occur in the event of a dam break in the Gurara Watershed. The integration of a GIS based model known as Hydrological Simulation Fortran Program (HSPF), field observations, and hydro-dynamic models was done to evaluate the impact of LULC and hydroclimatic variation on the attenuation capacity of a popular multipurpose dam in Nigeria and its impact in an event of failure. A simulated hydrodynamic model for the dam breach failure scenario of the Gurara dam was used to analyze its impact on the downstream LULC areas of the dam and watershed. The model was developed through careful selection of the existing correlation models that predict dam failure parameters using sensitivity analysis. The simulation result presents the extent of the flood downstream, which inundates 274.6 Km^2 (27,460 ha) of the watershed, that includes a peri-urban *Jere* town with a total population of 9,912 and 6,000 ha of irrigation area that has the potential to produce 100,000 metric tons of food in four circles per year. Further analysis of the result shows that the flood hazard map of the flooded area produced a varied index for each scenario, but it shows that the hazards increase with an increase in the literal inflow into the dam from the upstream runoffs. On the hazard map, vulnerable areas and their corresponding risks are produced from the data obtained from site information, personal interviews, and related literature. The flood vulnerability map shows a similar trend, and the elements at risk were known and evaluated accordingly. It shows that LULC areas with different zones of flood risk increase with increases in the literal inflow flood hydrograph. This study provides information on the potential disaster attached to dam failure in the neighborhood of the water-impoundment structure.

Keywords: Gurara Dam, Watershed, HSPF model, Dam break, Flood Risk

PROXIMAL POLICY OPTIMIZATION WITH CURRICULUM LEARNING FOR ENHANCED PATH PLANNING IN SWARM ROBOTICS

ALAA ISKANDAR

University of Miskolc, Faculty of Mechanical Engineering and Informatic

ORCID ID: 0000-0002-7746-9224

Dr. Béla KOVÁCS

University of Miskolc, Faculty of Mechanical Engineering and Informatic

ABSTRACT

Swarm robotics, in combination with deep reinforcement learning (DRL), presents a promising approach to enable a collective group of robots in learning, adapting, and solving intricate tasks. In this study, we explore the utilization of proximal policy optimization (PPO) to generate navigation behavior within a swarm robotics system. The environment is simulated using the Webots simulator in a 3D space. Specifically, we extend the PPO algorithm by incorporating curriculum learning and conduct a comparative analysis of its performance against the original PPO and the Deep Deterministic Policy Gradient algorithm. The proposed algorithm is designed to handle continuous states acquired from eight infrared (IR) sensors and continuous action spaces that represent the velocities of two motors. The primary objective of this research is to employ the proximal policy optimization algorithm for path planning in swarm robotics, while highlighting the advantages of incorporating curriculum learning to enhance the performance of deep reinforcement learning algorithms.

Keywords: Reinforcement learning, Proximal Policy Optimization, Path Planning, Swarm robots, Webots simulator, Curriculum learning.

COMPARATIVE EFFICACY OF MEDIUM SUPPLEMENT ASCORBATE AND THIOUREA ON THE HEAT TOLERANCE OF WHEAT

Ayesha IJAZ

Department of Botany, University of Agriculture, Faisalabad, Pakistan

Teacher, Laboratory Girls High School (PARS) University of Agriculture, Faisalabad, Pakistan

Kabeer AHMED

Faculty of Management Sciences, University of Central Punjab, Pakistan

Hafiz Qadeer AHMED

Institute of Animal and Dairy Sciences, University of Agriculture, Faisalabad, Pakistan

Veterinary Officer, Livestock & Dairy Development Department Govt. of Punjab, Pakistan

ABSTRACT

The present study aimed to investigate the impact of medium supplementation of thiourea and ascorbic acid on the heat tolerance of wheat variety Johar-16. A completely randomized factorial design with three replicates was used in a pot experiment. Two levels of medium supplementation, i.e., 400 µM and 500 µM of thiourea and ascorbic acid, respectively, were applied. To induce heat stress, pots were shifted to canopies. After 15 days of treatment application, physiological and morphological parameters were analyzed. The results showed that some parameters, such as root length, root fresh weight, root water content, leaf lamina and leaf sheath fresh weight ratio, shoot soluble phenolics, root potassium, shoot and root nitrates, and shoot sulphates, exhibited significant differences. In contrast, other attributes, including shoot length, number of leaves, leaf area, shoot fresh weight, shoot dry weight, root dry weight, shoot water content, shoot and root dry weight ratio, leaf lamina and leaf sheath dry weight ratio, root soluble phenolics, shoot and root anthocyanins, shoot and root ascorbate, shoot potassium, shoot and root calcium, shoot and root phosphates, and root sulphates, did not show significant differences.

Keywords: thiourea, ascorbic acid, heat tolerance, wheat variety, supplementation

KENT PLANLAMA KAPSAMINDA AFETE DUYARLILIĞIN ARAŞTIRILMASI: MENTEŞE İLÇESİ (MUĞLA)

INVESTIGATION OF DISASTER SUSCEPTIBILITY WITHIN THE SCOPE OF URBAN PLANNING: MENTEŞE DISTRICT (MUĞLA)

Kübra ALĞIN DEMİR

Dokuz Eylul University, Graduate School of Natural and Applied Sciences, City and Regional Planning Ph. D. Program, Izmir, Türkiye

ORCID ID: 0000-0001-7386-983X

Mercan EFE GÜNEY

Dokuz Eylul Universty, Faculty of Architecture, Department of City and Regional Planning, Izmir, Türkiye

ORCID ID: 0000-0001-8498-4796

ÖZET

Türkiye, coğrafi konumu ve jeolojik yapısı nedeniyle sık sık afetlerin yaşandığı ülkeler arasında ilk sıralarda yer almaktadır. Dolayısıyla ülke sınırları içerisinde yer alan birçok şehir, meydana gelmesi olası afet sorunlarıyla karşı karşıya kalmaktadır. Nitekim son yıllarda yaşanan deprem, heyelan, su baskını ve yangın gibi felaketler söz konusu durumu kanıtlar niteliktedir.

Afetlerin büyüklüğünde; meydana geldikleri bölgelerde özellikle bölgenin şartları, yoğunluk (nüfus), jeolojik yapı unsurları, toprak ve bitki örtüsüne uygun bir yapılaşma nizamı gibi yönlendirici birçok unsur etkilidir. Dolayısıyla doğal yaşam unsurlarını sekteye uğratan, can ve mal kayıplarıyla toplum yapısında ciddi yıkımlara sebep olan afetlerin, insan yapımı tehlikeler ve bu tehlikelerin oluşturduğu riskler ile bir bağıntısı olup olmadığının önceden araştırılması ve bu doğrultuda önlemler alınması gerekmektedir.

Bu kapsamda çalışmanın amacı, afet sonrası bir çalışmanın yerine afete duyarlılığın, kent planlama kapsamında araştırılmasını ve planların, jeolojik etüt raporları ve ilgili analizler (Jeoloji ve fay haritası, deprem risk analizi, toprak analizi, kent makroformuna ilşkin analizler vb.) bağlamında karşılaştırmasını sunmaktır. Çalışma ek olarak risk teşkil eden bölgelerin önceden saptanmasını sağlayarak olası felaketlerin önüne geçilmesi konusunda örnek olmaya çalışmaktadır. Çalışmada afete duyarlılığı, kent planlama eylem alanında Muğla ilinin merkez ilçesi olan Menteşe ilçesi üzerinden sınamaktadır. Çalışma şehir planlama mesleğinde deprem öncesi irdelemelerin ne olması gerektiği ve sonuçların nasıl değerlendirilmesi gerektiği konusunda ilgili literatüre katkı koymaktadır.

Anahtar kelimeler: Afet, afet riski, kent planlama, afet ve planlama ilişkisi, Menteşe.

ABSTRACT

Due to its geographical location and geological structure, Turkey is one of the countries where disasters occur frequently. Therefore, many cities located within the borders of the country are faced with possible disaster problems. As a matter of fact, disasters such as earthquakes, landslides, floods and fires experienced in recent years are evidence of this situation.

In the magnitude of disasters; in the regions where they occur, many guiding factors such as especially the conditions of the region, density (population), geological structure elements, a construction order suitable for soil and vegetation are effective. Therefore, it is necessary to investigate beforehand whether disasters that disrupt natural life elements, cause loss of life and property and serious destruction in the

social structure, have a relationship with man-made hazards and the risks posed by these hazards, and measures should be taken in this direction.

In this context, the purpose of the study is to investigate disaster sensitivity within the scope of urban planning instead of a post-disaster study and plans, geological survey reports and related analyses (Geology and fault map, earthquake risk analysis, soil analysis, urban macroform analyses, etc.) is to present the comparison in context. In addition, the study tries to be an example in preventing possible disasters by predetermining the risky areas. In the study, the sensitivity to disasters is tested through Menteşe district, which is the central district of Muğla province in the field of urban planning action. The study contributes to the relevant literature on what should be the pre-earthquake investigations in the city planning profession and how the results should be evaluated.

Keywords: Disaster, disaster risk, urban planning, disaster and planning relationship, Menteşe.

DEGRADATION OF PLASTICS WASTE EFFECTS ON THE ENVIRONMENT: A SCIENTIFIC REVIEW

Subhashish DEY

Department of Civil Engineering, Gudlavalleru Engineering College, Gudlavalleru, Andhra Pradesh, India

ABSTRACT

Since last few decades the uncontrolled use of plastics for various purposes such as packaging, transportation, industry and agriculture in rural as well as urban areas, has elevated serious issue of plastic waste disposal and its pollution. The efficient decomposition of plastic bags takes about hundreds years. Plastic causes pollution and global warming not only because of increase in the problem of waste disposal and land filling but also release CO_2 and dioxins due to burning. Commonly used methods for plastic disposal were proved to be inadequate for effective plastic waste management and hence there is growing concern for use of efficient microorganisms meant for biodegradation of non-degradable synthetic polymer. The biodegradable polymers are designed to degrade fast by microbes due their ability to degrade the most of the organic and inorganic materials, including lignin, starch, cellulose and hemicelluloses. The present review discusses the current status, mechanisms of biodegradation of plastics, techniques for characterizing degraded plastics and factors affecting their biodegradation.

Keywords: *Plastics, Biodegradable polymers, Waste management, Decomposition, Microorganism and Degradation.*

TO REMOVE INORGANIC AQUEOUS EFFLUENTS, LOW-COST BIO ADSORBENTS ARE USED

Djellouli AMIR

Université mohammed chérif mesaadia de Souk-Ahras, Algeria

Laboratory for Water and Environmental Sciences and Technology, University of soukahras, Algeria

Center for Scientific and Technical Research on Arid regions CRSTRA, Biskra, 07000, Algeria

Laboratory of Physics of Matter and Radiation (LPMR)

ORCID ID: 0000-0001-5092-2212

Berredjem YAMINA

Laboratory for Water and Environmental Sciences and Technology, University of soukahras, Algeria

Badji Mokhtar-Annaba University, Algeria

Hattab ZHOUR

Badji Mokhtar-Annaba University, Algeria

Khechai MOHAMED

Department of industrial Chemistry, University of Biskra, PO Box 145, Biskra, 07000, Algeria

Guesmia HADJER

Center for Scientific and Technical Research on Arid regions CRSTRA, Biskra, 07000, Algeria

Azri NAIMA

Department of industrial Chemistry, University of Biskra, PO Box 145, Biskra, 07000, Algeria

Sara NCIBI

INSTITUT NATIONAL AGRONOMIQUE DE TUNISIE, Tunisie

ABSTRACT

This study's goal was to synthesize and construct biomaterials of the cationic and anionic types. These substances were utilized as adsorbents in waters that had been contaminated by various adsorbates that were probably prevalent in the environment. In order to describe the various materials, various approaches (IRTF, DRX, MEB, BET, and ATG/DTA) will be used. Studies on the adsorption by these substances will be conducted while changing a number of variables, including pH, mass, concentration, and temperature.

Removal of effluents in aqueous media, particularly the adsorption technique, which appears to be well suited to remove pollutants due to its shown efficacy as well as for financial reasons, using inexpensive adsorbents such agricultural and industrial wastes.

Keywords: Characterization; Different materials; Water treatment; Bio adsorbents; adsorption

ANTI- OXIDANT ACTIVITIE OF EXTRACTS FROM Ocimum basilicum L and Artemisia campestris A

Yassmine CHENNAI

Dr., Mohamed Khaidhar University, Biskra

Assma FETTEH

Dr., Mohamed Khaidhar University, Biskra

ABSTRACT

The algerian flora provides a diverse range of aromatic plants with a high therapeutic interest due to their secondary biologically active metabolites, which have sparked scientific interest.

In this study, we are interested in the plants Ocimum basilicum L. of the Lamiaceae family and Artemisia campestris A. of the Asteriaceae family, which are well known locally and have a variety of curative properties in traditional medicine. The first part of this study is devoted to the quality control of the plant powder and the investigation of the metabolites. The phytochemical screening revealed the presence of flavonoids, tannins, coumarine, essential oil, and other metabolic compounds.The HE were obtained using hydrodistillation with a yield of 2.4% for O.basilicum L. and 1.8% for A.campestris A.The phenolic compounds were obtained by a series of extractions with four solvants of increasing polarity.The concentration of these extracts in total polyphénols, flavonoids, and tanins was determined by using the reactif Folin Ciocalteu, aluminum trichlorure, and vanilline with the addition of chlorhydric acid. In the second section, we investigated the antioxidative capacity of extracts (HE and phenolic compounds) in vitro using the DPPH method.

The results show that our extraits have interesting antioxidant properties, with ethyl acetate being the most effective.Furthermore, the essential oil has a very low antioxidative activity when compared to the benchmark for the two plants.

Finally, we assessed the antibacterial activity of our extracts against ten pathogenic bacteria using the MH diffusion method.

The results show that phenolic extracts of O.basilicum L. have higher activity for HE.Unlike A.campestris A., the acétate of éthyle extract is the most active on the majority of Gram+ souches.

Keywords: O.basilicum L., Artemisia campestris A, Antibacterial, oxidant activities

IMPLEMENTATION OF A SENSORLESS PREDICTIVE DTC-SVM OF AN INDUCTION MOTOR WITH A NEW MRAS OBSERVER

Mohamed CHEBAANİ

Department of Electrical Engineering, LGEB laboratory, Biskra University, Algeria

Ahmed Marouane GHODBANE

Department of Electrical Engineering, LGEB laboratory, Biskra University, Algeria

Amar GOLÉA

Department of Electrical Engineering, LGEB laboratory, Biskra University, Algeria

M^{ed} Toufik BENCHOUİA

Department of Electrical Engineering, LGEB laboratory, Biskra University, Algeria

Noureddine GOLÉA

Electrical Engineering Department, LGEA laboratory, Oum El Bouaghi University, Algeria

ABSTRACT

In this paper, a new speed estimation method using model reference adaptive system (MRAS) is proposed to improve the performance of a sensorless predictive DTC-SVM of an Induction Motor (IM) drive. The Sensorless DTC-SVM associated with the PC, leads to an excellent dynamic behavior of the IM and mitigates the drawbacks of the conventional DTC also low cost due to the absence of speed measurement components. The predictive controller based on the DTC -SVM technique is developed. The effectiveness of the proposed approach is evaluated through the numerical simulation, using MATLAB-Simulink and the experimental implementation using dSPACE 1104. Besides, the DTC-SVM combined with the PC, reduces effectively the flux and the torque ripples with better dynamic and steady state performance.

DESIGN AND IMPLEMENTATION OF MICROCONTOLLER BASED PI CONTROLLER FOR BUCK CONVERTER

Mehmet Akif ÇÖKREN

Elektrik Mühendisi, Kocaeli Üniversitesi, Mühendislik Fakültesi, Elektrik, Kocaeli, Türkiye

ORCID ID: 0009-0008-0125-4965

Tarık ERFİDAN

Doktor Öğretim Görevlisi, Kocaeli Üniversitesi, Mühendislik Fakültesi, Elektrik, Kocaeli, Türkiye

ORCID ID: 0000-0001-9635-5073

ÖZET

Günümüzde DA yüklerin artmasıyla DA-DA dönüştürücülerin önemi ve kullanım alanları çok artırmıştır. Giriş gerilimi veya yük değişimlerinde DA-DA dönüştürücülerin sabit gerilim ve akım verebilmesi çok önemlidir. Günümüzde yaygın olarak kullanılan PID kontrol tekniği, bu gibi olumsuz durumlarda yaygın olarak kullanılmaktadır. Ancak, dönüştürücülerde, tek döngü ile kullanılan PI denetleyicisi ile, değişken çıkış yükleri sırasında anlık kararsızlıklar yada sapmalar yaşanmaktadır. Bu çalışmada, çift-döngü PI denetleyici tasarımı ile bu kararsızlıklar ve sapmaların minimize edilmesi amaçlanmıştır. PI katsayıların elde edilmesi için basit ama etkili bir yöntem olan *Ziegler-Nichols* kullanılmıştır. PI denetleyicinin gerçekleştirilmesi için, Arm Cortex-M4 32 Bit çekirdeğe sahip 180MHz hızında çalışan STM32F429 mikrodenetleyicisi kullanılmıştır. Farklı giriş gerilimi ve yük durumları için tasarlanan sistem test edilip sonuçlar elde edilmiştir.

Anahtar kelimeler: Düşürücü tip dönüştürücü, PI Kontrol, Mikrodenetleyici, Çift-Döngü PI Kontrol, PWM, *Ziegler*-Nichols

ABSTRACT

The increasing demand for DC loads has significantly elevated the importance and usage area of DC-DC converters. The ability of DC-DC converters to provide stable voltage and current during input voltage or load variations is crucial. The widely used PID control technique is commonly utilized in such adverse conditions. However, with the single-loop PI controller typically used in converters, momentary instabilities or deviations occur during variable output loads. This study aims to minimize these instabilities and deviations through the design of a dual-loop PI controller. The Ziegler-Nichols method, a simple yet effective approach, is utilized to obtain the PI coefficients. The implementation of the PI controller utilizes an STM32F429 microcontroller with an Arm Cortex-M4 32-bit core running at a speed of 180 MHz. The system designed for different input voltages and load conditions is tested, and results are obtained.

Keywords: Buck Converter, PI Control, Microcontroller, Double-Loop PI Kontrol, PWM, Buck Converter, *Ziegler*-Nichols.

IMPLEMENTATION OF A SENSORLESS PREDICTIVE DTC-SVM OF AN INDUCTION MOTOR WITH A NEW MRAS OBSERVER

Mohamed CHEBAANI

Department of Electrical Engineering, LGEB laboratory, Biskra University, Algeria

ORCID ID: 0000-0000-0000-0000

Ahmed Marouane GHODBANE

Department of Electrical Engineering, LGEB laboratory, Biskra University, Algeria

ORCID ID: 0000-0000-0000-0000

ABSTRACT

In this paper, a new speed estimation method using model reference adaptive system (MRAS) is proposed to improve the performance of a sensorless predictive DTC-SVM of an Induction Motor (IM) drive. The Sensorless DTC-SVM associated with the PC, leads to an excellent dynamic behavior of the IM and mitigates the drawbacks of the conventional DTC also low cost due to the absence of speed measurement components. The predictive controller based on the DTC -SVM technique is developed. The effectiveness of the proposed approach is evaluated through the numerical simulation, using MATLAB-Simulink and the experimental implementation using dSPACE 1104. Besides, the DTC-SVM combined with the PC, reduces effectively the flux and the torque ripples with better dynamic and steady state performance.

Keywords: Induction Motor (IM), DTC-SVM, Predictive Control (PC), Implementation , Torque and flux ripples, dSPACE 1104.

DIVERSITY OF PLANT GENETIC RESOURCES IN THE EASTERN ZAB OF THE WILAYAH OF BISKRA

Debabeche KAOUTHER

Scientific and Technical Research Center on Arid Regions, Biskra, Algeria

ORCID ID: 0000-0002-3619-0059

Debabeche BOUTHAINA

Mohamed Khider University, Sciences and Technology Faculty, Hydraulic Department, Biskra, Algeria

ORCID ID: 0000-0002-1463-6558

ABSTRACT

The objective of this research is to monitor the situation of plant resources in the eastern region of the wilayah of Biskra. The municipality of Ain Naga ranks second in greenhouse vegetable production and third in open field production in the wilayah. Despite this, a genetic decline of plant species is well distinguished. To this end, we have found it useful to examine in this work the subject of the preservation of local plant resources. This study is based on a survey conducted among the Agricultural Services Directorate and the farmers in the municipality of Ain Naga. The results indicated that farmers exploit only 10% of the local seeds in the municipality with a significant decline in this type of seed under greenhouse. Five classes emerged to distinguish the diversity of local seeds. The majority of local seeds of pumpkin, okra, broad bean, pea and chilli pepper, are available 100% in the field, 20% and 10% respectively for broad bean, pea and then chilli pepper under greenhouse. Others have become moderately exploited: this is the case for garlic, onion with 80%, melon much more with 70% under greenhouse and carrot with 70%. Cucumbers and tomatoes were less exploited with 10% each, and others are practically lost in the municipality: lettuce, courgette, pepper, artichoke, bean, eggplant and watermelon. Local seeds of medicinal and condiment species remained available in the field. Further studies on the state of the art would be recommended for other municipalities to achieve the restoration of local seeds.

Keywords: agriculture, diversity, species, restoration.

STUDY OF SOME CHEMICAL AND BIOCHEMICAL PARAMETERS OF POMEGRANATE BARK GROWN IN GHRADIA (ALGERIA)

BENAISSA Yamina

University Ahmed Ben Bella Oran 1, Laboratory of Physiology of Nutrition and Food Safety

Faculty of Medicine Oran1, Histology-Embryology, Cytology and Genetics Department

DJELLED Djihen

University Ahmed Ben Bella Oran 1, Laboratory of Physiology of Nutrition and Food Safety

ADDOU Samia

University Ahmed Ben Bella Oran 1, Laboratory of Physiology of Nutrition and Food Safety

ABSTRACT

With its delicious taste and numerous health benefits, the pomegranate has enjoyed a resurgence in popularity around the world. Pomegranate peel alone accounts for 40-50% of the total pomegranate weight and contains a wide range of bioactive substances.

The objective of our work is to determine certain physico-chemical properties of pomegranate bark from the wilaya of Ghardaïa in Algeria and also a biochemical assay on 4-week-old wistar rats followed by a treatment of pomegranate bark. pomegranate in powder form on wounds in the skin.

For this we evaluated without pH, its water content and its protein content by the Bradford method and its antioxidant activity by trapping the free radical DPPH and thus biochemical assays such as urea and creatinine.

Our results show that pomegranate peels have a pH=6.03, a water content = 26.4%, a protein level is 2.18 ug/ml and an antioxidant activity slightly lower than that of vit C. The values of IC50 proved (125.71 ug/ml) for pomegranate and (115.12 ug/ml) for vit C and concerning the test of urea and creatinine are 06 (mg/dl), 0.5 (mg/dl) in rats treated with 0.5g of pomegranate powder.

In conclusion, our results indicate that pomegranate peel has a rich potential for the food industry and human health, offering both protein and antioxidants, in addition to possessing remarkable healing properties.

Keywords: pomegranate bark, healing activities, pleasure ointment, Wister rat

TIMES NEW ROMAN, 12 PT, BOLD

ALILI Zakaria

University of Msila, Faculty of since and technology, Departmentof Electrical Engineering, Msila, Algeria

GHADBAN Ismail

University of Msila, Faculty of since and technology, Departmentof Electrical Engineering, Msila, Algeria

BOUZİDİ Riad

University of Msila, Faculty of since and technology, Departmentof Electrical Engineering, Msila, Algeria

ABSTRACT

In this study, we simulated a sensorless BLDC motor control system using MTLAB/SIMULINK . An observing method is used to determine the value of buck-EMF by observing the variation of buck-EMF with known inputs such as both voltage and current. This method is different from the buck-EMF detection method, which works well at high motor speeds because the size and value of the buck-EMF depend on how fast the rotor is turning. This approach is based on predicting the buck-EMF value and giving the trapezoid shape using equations with known inputs. It delivers good performance in the lower motor speed range as well as at high speeds. This allows us to calculate the rotor position angle independent of rotor speed or Hall sensors. After determining the position of the rotor, we will create a circuit to control the motor speed and provide it with different reference speed values to determine the accuracy of the system over a range of speeds, while comparing the values that come out of the equations with the values that come out of the sensors and showing the results in curves that show how accurate and similar the two sets of values are.

Keywords: Sensorless , BLDC motor , buck-EMF.

SYNTHESIS OF WURTZITE PHASE ZNO NANOPARTICLES USING COMBUSTION METHOD AND COMPUTATIONAL STUDIES

S. MANSY

University collage of Science and Technology, Department of Engineering Sciences and Applied Arts P.O. Box 8, Kan Yunis, Palestine

H. MUSLEH

Al Azhar University-Gaza, Physics Department, P.O. Box 1277, Gaza, Palestine

S. SHAAT

Islamic University of Gaza, Physics Department, P.O. Box 108, Gaza, Palestine

J. ASAD

Al Azhar University-Gaza, Physics Department, P.O. Box 1277, Gaza, Palestine

N. ALDAHOUDİ

Al Azhar University-Gaza, Physics Department, P.O. Box 1277, Gaza, Palestine

ABSTRACT

In this template, the congress formatting requirements are described. The abstract should be at least 300 words, including spaces and summarise the main points of the paper. Font should be Times New Roman, font size 12 pt. Page Margins: Top, bottom, left and right margins must be set to 2,5 cm. Do not add paragraph spacing. All papers should be written as *.doc or *.docx format and they should be submitted to email address of conference website.

ZnO nanoparticles (NPs) were synthesized using solution combustion method. The prepared sample was examined by different techniques such as X- ray diffraction (XRD), scanning electron microscope (SEM) and UV-Vis spectroscopy. XRD of the obtained ZnO NPs exhibited hexagonal a single-phase wurtzite structure. The estimated average crystallite size is 20.86 nm. The lattice parameters are a = 3.297 A◦ and c = 5.329 A◦. The calculated value of the anion-cation length for experimental calculation is 2.008 A◦. The experimental value of energy band gap is 3.14 eV. Different structural, optical and electrical parameters have been computed using the exchange-correlation potential with local-density approximation (LDA) exchange-correlation function corrected with the Hubbard (U) technique using generalized gradient approximations (GGA) of Perdew-Burke-Ernzerhof (PBE) correction. The computed lattice parameters (a = 3.244A◦ and c = 5.199 A◦). The calculated value of the anion-cation length for computational calculation is 1.974 A◦. The computed energy band gap from is 3.16 nm and the Urbach energy is 1.94 eV. The static reflectivity *R*(0) about 0.046 a.u and the maximum reflectivity percentage is around 0.216 a.u at energy = 17.03 eV. The energy loss of the computational computations at energies of 19 and 20.19 eV. Combustion technique synthesized NPs possess small sized particles. This research leads to develop a new way of cost-efective synthesis and reducing usage of chemicals in further studies.

PREDICTING OCCUPANCY RATE IN PUBLIC TRANSPORTATION SYSTEMS USING AIR POLLUTION DATA

Seren ÇARIKCI

Kent Kart Ege Elektronik San. Tic. A.Ş / R&D Center İzmir, Türkiye

ORCID ID: 0009-0007-1848-599X

Bekir ÖZYURT

Kent Kart Ege Elektronik San. Tic. A.Ş / R&D Center, İzmir, Türkiye

ORCID ID: 0000-0001-8307-5291

M. Burak AYDIN

Kent Kart Ege Elektronik San. Tic. A.Ş / R&D Center İzmir, Türkiye

ORCID ID: 0000-0003-0563-761X

ABSTRACT

The use of public transport is very common in big cities. The numbers and route trips of these vehicles are determined by the administrations (such as the municipality). During the decision making, issues such as the density of settlements, the start and end times of working hours, and holidays are taken into consideration. Despite the decision-making mechanism, tools may be insufficient at certain times and locations. In addition, passengers who are worried about high air pollution with Covid-19 would like to plan their travels by public transportation. Therefore, the occupancy rate of the vehicles is an important parameter to provide the decision making mechanism for route trip planning by administrations. Also, passengers can make use of the occupancy rate in-vehicle to plan their travels. In this study, air pollution value were obtained based on the carbon dioxide (CO_2) data coming from the smart sensors in the vehicle to provide a decision support system for administrations according to in-vehicle occupancy rate. Using the air pollution value, the occupancy rate in the public transportation systems has been predicted and presented according to the route trip and/or location. For the analysis, real data were obtained from smart sensors on buses in a city.

Keywords: Occupancy rate, public transport, air pollution, prediction, smart sensor.

WAYS OF REDUCING FRESHET PROCESSES BY THE TECHNOLOGY OF ANTI-EROSIONAL IRRIGATION

Vakhtang NANITASHVILI

Georgian Technical University (GTU), Faculty of Construction, Department of Hydroingineria, Tbilisi, Georgia

ORCID ID: 0000-0002-0979-8720

ABSTRACT

With a view to enhancing agriculture in Georgia's mountainous and foothill regions, the paper presents the organization of irrigation systems equipped with sprinkling machines, ruling out irrigational erosion and the risk of occurrence of freshets. Analysis is made of erosional conditions at sprinkling irrigation works, which directly depend on water infiltration in the soil during freshet processes. The greater the infiltration, the lesser is the possibility of accumulation of surface water. On the basis of the studies carried out, values of permissible intensity of sprinkling are obtained for slopes of various inclinations, according to soil type.

NUMERICAL SOLUTION OF VOLTERRA INTEGRO-DIFFERENTIAL EQUATIONS USING BERNSTEIN POLYNOMIALS

Oluwaseun Bıodun ONUOHA

Department of Mathematics, Adekunle Ajasin University, Akungba-Akoko, Nigeria

Emmanuel Adewale ADENIPEKUN

Department of Mathematics and Statistics, Federal Polytechnic Ede, Odun, Nigeria

Zubaır Obashola RUFIU

Department of Mathematics and Statistics, Kwara State Polytechnic, Ilorin, Nigeria

Ibrahim SALIHU

Department of Mathematics, University Abuja, Abuja, Nigeria

Abdullahı Muhammed AYINDE

Department of Mathematics, University Abuja, Abuja, Nigeria

Taıye OYEDEPO

Department of Applied Sciences, Federal College of Dental Technology and Therapy, Enugu, Nigeria

ABSTRACT

The study gears toward finding the numerical solution of Volterra Integro-Differential Equations (IDEs) using Bernstein polynomials as basis functions. The method assumed an approximate solution by means of Bernstein, which is substituted into the problem considered and thereafter converted into a linear algebraic system of equations, after which and matrix inversion is employed to solve the algebraic equations. Numerical examples were examined, and the approach was found to be both accurate and efficient. Additionally, tables are used to illustrate the results.

Keywords: Bernstein polynomials, Integro-differential equations, approximate solution, matrix inversion

RELATIONSHIP BETWEEN SUSPENDED SEDIMENT CONCENTRATION AND WATER DISCHARGE DURING FLOODS ON ABIOD WADI, BISKRA, ALGERIA

Debabeche BOUTHAINA

University of Liege, Faculty of Applied Sciences, Liege, Belgium

Mohamed Khider University, Sciences and Technology Faculty, Hydraulic Department, Biskra, Algeria

ORCID ID: 0000-0002-1463-6558

Benkhaled ABDELKADER

Research Laboratory in Subterranean and Surface Hydraulics

ORCID ID: 0000-0001-9819-2087

Debabeche KAOUTHER

Scientific and Technical Research Center on Arid Regions, Biskra, Algeria

ORCID ID: 0000-0002-3619-0059

ABSTRACT

This study analyses the patterns of the suspended sediment concentration and the flow discharge relationship during floods in Abiod Wadi. Eleven events (11 floods) were selected to identify this relationship. . The process of selecting the ideal C-Q associations is based on the general shape of the graphs and statistics of the C and Q variables, in particular Skewness and Kurtosis. The results show several configurations of the C-Q relationship which is a most hydrometeorological process in hydrology. The different forms of the C-Q relationship obtained are explained by different factors, among others rainfall, contributing area mechanism and soil erosion processes.. The hysteresis analysis allowed us to classify the selected floods into two categories with a dominance of the first class (clockwise) over the second class (counter-clockwise).

Keywords: Suspended sediment concentration, , Flow discharge, Floods, Hysteresis, Abiod wadi, Biskra, Algeria

NEW APPROACHES IN BEEHIVE SENSORING AND MONITORING

Ekin VAROL

Res. Assist., Ege University, Faculty of Agriculture, Department of Animal Science, İzmir, Türkiye

ORCID ID: 0000-0003-4382-5427

Banu YÜCEL

Prof. Dr., Ege University, Faculty of Agriculture, Department of Animal Science, İzmir, Türkiye

ORCID ID: 0000-0003-4911-7720

Gamze ERTEM

Ege University, Graduate School of Natural and Applied Sciences, İzmir, Türkiye

ORCID ID: 0000-0003-2072-544X

ABSTRACT

Beekeeping is an agricultural activity that has been done in our country and in the world since the ancient times. Developing technology and bee losses due to different factors experienced in recent years have enabled the development of modern systems in beekeeping. Modern beekeeping is an activity that requires good technical knowledge and experience, and a good planning and control mechanism. Both the natural structure of the bees, their way of life, and their life as a colony in a hive show that the traceability of bees is not very easy compared to other livestock systems. In recent years, remote sensing and mobile data providing and monitoring activities developed for these purposes have become increasingly important. In beekeeping, keeping records, the acquisition and evaluation of data and the elimination of stress factors during these processes are very important especially in the production of bee products and fighting against bee diseases and pests. To determine the effects of all environmental and related factors on honeybees, appropriate data within the hive should be collected and evaluated at regular intervals. Determining more concretely the causes of bee losses, especially due to honeybee pests, pesticides used or climatic conditions, information about the colony should be analyzed regularly. With the developed technology, it is possible to record, analyze and evaluate the data taken from beehives. Colony-related parameters such as air humidity, humidity inside the hive, gas composition, sound and vibration of the hive, number of incoming and flying bees, weight and temperature data can be controlled with sensors placed in the hives and infrared imaging system monitors. In addition, factors such as the development of the system with technological changes, the evaluation of different features, and the creation of more data storage space should be investigated. Efforts should be made to start the application of this system, which has just started to be used in the world and has been rapidly adopted, to apiaries in our country, and parameters such as economic and easy application of the system should be considered as a priority.

Keywords: Beekeeping, monitoring, remote sensoring, data, mobile data

APITHERAPEUTIC PROPERTIES OF BEE VENOM IN HUMAN AND ANIMAL HEALTH

Ekin VAROL

Res. Assist., Ege University, Faculty of Agriculture, Department of Animal Science, İzmir, Türkiye

ORCID ID: 0000-0003-4382-5427

Banu YÜCEL

Prof. Dr., Ege University, Faculty of Agriculture, Department of Animal Science, İzmir, Türkiye

ORCID ID: 0000-0003-4911-7720

ABSTRACT

Bee venom is a very important and valuable bee product with its unique properties. Honeybee venom (apitoxin) is produced in the venom glands in the abdominal cavity of the worker bee and stored in the venom sac. Bee venom, which is produced in the venom glands in the abdominal cavity of the bees, is secreted from the venom sac located in the last segment of the bee's abdomen. The bee stinger is about 2 mm long and has a pointed tip. The sting is the most important defense and attack organ of bees. The use of bee venom for treatment dates back to ancient times. These applications, which is called as Apitherapy, are the way bee and bee products are used as a preventive method for the human body and as a complementary application method in the treatment of some diseases. Bee venom in liquid or powder form is used in the treatment of many diseases.

Pharmacologically, bee venom has many effects that increase blood circulation, rejuvenate the skin, increase smooth muscle contraction, bactericide, regulate heart rhythm and functions, increase blood flow in the heart and brain vessels, increase adrenaline level, protect against radiation, relieve pain before menstruation period in women, and lower blood pressure. Besides, many studies have been conducted on the therapeutic properties of bee venom in pets and farm animals and successful results have been obtained. Bee venom in different forms has different usage methods and forms in human and animal health. Bee venom is a highly specialized product with highly effective properties. For this reason, beekeepers who are open to modern production and development should be encouraged and supported in bee venom production, and scientific studies on the use of bee venom in complementary medicine should be intensified.

Keywords: Beekeeping, bee venom, apitheraphy, health

STRUCTURAL STUDY OF A MEMBRANE BASED ON CHITOSAN AND HYDROXYETHYL CELLULOSE

Nassima CHEKROUN

Abou Bekr Belkaid University, Faculty of Sciences, Departement of chemistery, Tlemcen, Algeria

Houcine ZIANI CHERIF

Abou Bekr Belkaid University, Faculty of Sciences, Departement of chemistery, Tlemcen, Algeria

ABSTRACT

Bleeding control is of major concern during surgery and combat trauma, and when not treated properly, it may result in severe consequences or death of the patient. Accordingly, the use of biomaterials known for their coagulating effects such as gelatin, rice starch, oxidized cellulose and chitosan is well known. These biomaterials have been used for their natural origin, their abundance as well as their biodegradability. The aim of this work is to develop an effective chitosan-based hemostatic material used as a wound dressing, using chitosan a bioactive material which has hemostatic properties, as well as hydroxyethyl cellulose, a water-soluble polymer which aims to improve the mechanical properties of chitosan. Thus, films containing chitosan and hydroxyethyl cellulose were prepared by the solution casting method, and their characterization by FTIR and UV-VISIBLE was carried out.

Keywords: Biomaterials, Chitosan, Hydroxyethyl cellulose, Hemostasis, Coagulation.

ANTIOXIDANT PROPERTIES OF FIVE *LACTOBACILLUS PLANTARUM* STRAINS AS PROBIOTICS

Manel SEBOUAI

University of Bejaia, Faculty of Nature and Life Sciences, Department of Physical Biology and Chemistry, Bejaia, Algeria

ORCID ID0009-0006-2805-0706

ABSTRACT

Consumers are increasingly looking for functional foods that offer health benefits above and beyond their basic nutritional purpose. Numerous clinical studies regarding their potential in the prevention of some diseases have been made public. As a result, the use of probiotic bacteria has increased significantly over the past two decades. Due to their numerous health benefits, some of which seem connected to their antioxidant properties, lactic acid bacteria (LAB) are the most commonly used probiotics in fermented foods and beverages and food supplements for humans or animals. Hydrogen peroxide (H2O2) is a significant biologically active, non-radical reactive oxygen species, while it is not toxic on its own, it can be transformed into considerably more dangerous radicals. In the current study a speedy, low-cost, reproducible, specific, sensitive, and accurate method for detecting the anti-oxidant H2O2 scavenging activity of five lactobacillus plantarum strains isolated from poultry feces. We employed 1,10-phenanthroline and ferrous ammonium sulfate to test scavenging activity. AML3 strain showed the highest scavenging activity, with inhibition rates of 78.57%. P3F, AML1, AML2 and AML5 showed also great activity 73.47 %, 69.39 %, 71.60 % and 74.90 % respectively. This study demonstrated that *L. plantarum* strains isolated from poultry could be considered a potential antioxidant for functional foods.

Keywords: *Lactobacillus plantarum*, H2O2, antioxidant activity.

THE DUAL ION CONDUCTING SOLID OXIDE FUEL CELLS

Sarah GUENOU

Amar Thlidji University, Faculty of Technology, Electronic Department, Laghouat, Algeria

ORCID ID: 0009-0004-0457-4180

Ali CHENANE

Dr., Amar Thlidji University, Faculty of Technology, Electronic Department, Laghouat, Algeria

ORCID ID: 0000-0000-0000-0000

Naceur SELMAN

Dr., Amar Thlidji University, Faculty of Technology, Electronic Department, Laghouat, Algeria

ORCID ID: 0000-0000-0000-0000

ABSTRACT

Solid oxide fuel cells (SOFCs) are devices used for energy conversion, which can convert the chemical energy from different fuels directly into direct current electricity. They are able to accomplish this with great effectiveness and reduced emissions by means of a sequence of electrochemical reactions that take place at high operating temperatures, typically ranging from 400 to 1000 °C. The properties of the electrolyte materials play a crucial role in determining the operating temperature and working principle of SOFCs. In recent research, there has been a growing emphasis on lowering the operating temperature to enhance cost-effectiveness and stability.

Reducing the operating temperature primarily relies on maintaining a low ohmic resistance of the electrolyte and minimizing the polarization resistance of the electrodes. Additionally, the mechanical and chemical stability of the electrolyte is a significant concern in practical applications. Electrolyte materials can be broadly categorized into three types based on their ion conduction mechanisms: oxygen ion-conducting, proton-conducting, and dual ion-conducting electrolytes (DICS).

Oxygen ion-conducting electrolytes enable the conduction of oxygen ions from the cathode to the anode. Proton-conducting electrolytes facilitate the conduction of protons from the anode to the cathode. Various perovskite oxides, such as doped barium zirconate and doped strontium cerate, have shown promising proton conductivity. DIC electrolytes exhibit the capability to conduct both oxygen ions and protons. One example is a composite electrolyte comprising a proton-conducting material and an oxygen ion-conducting material.

This review offers a thorough overview of the latest progress made in the advancement of three categories of electrolyte materials used in intermediate-temperature solid oxide fuel cells (SOFCs), with a focus on conductivity and stability. The research highlights advancements in material composition, processing techniques, and structural design to enhance performance. Challenges related to long-term stability, material compatibility, and cost-effectiveness are also discussed.

In conclusion, lowering the operating temperature of SOFCs is a significant area of research to improve their efficiency, stability, and cost-effectiveness. Advances in electrolyte materials, including oxygen ion-conducting, proton-conducting, and dual ion-conducting electrolytes, are crucial for achieving this goal. Further research and development are needed to address the current challenges and unlock the future potential of intermediate-temperature SOFCs.

Keywords: Solid oxide fuel cells, Dual-ion conducting SOFCs, Electrolyte, Oxygen ions, Protons.

POSSIBILITIES OF APPLICATION OF INNOVATIVE TECHNOLOGIES IN CHEMICAL EDUCATION

Kuchkarov Mexriddin ASAMOVICH

Doctor of Philosophy, PhD, Tashkent State Pedagogical University named after Nizami, Faculty of Natural Sciences, Tashkent, Uzbekistan

Mamadalieva Nodira ISAKOVNA

Docent, Doctor of Philosophy, PhD, Tashkent State Pedagogical University named after Nizami, Faculty of Natural Sciences, Tashkent, Uzbekistan

ORCID ID: 0000-0001-7074-4126

ABSTRACT

This article describes the possibilities of using interactive educational methods, graphic organizers, strategies in order to increase the activity of students in the process of chemistry education, to form creative, creative thinking skills, to improve educational efficiency. Of particular relevance is the improvement of the quality of teaching chemistry, the use of the capabilities of advanced educational technologies, especially the improvement of methods aimed at teaching chemistry in an innovative educational environment.

Keywords: Interactive methods, Keys-Studio, strategies, brainstorm, organizers, Venn diagram, fishbone

CHANGES IN THE CONTENT OF PHOSPHOLIPIDS AND THEIR FRACTIONS IN CARDIAC TISSUE IN SUBCOMPENSATED AND DECOMPENSATED HYPOBARIC HYPOXIA

Mamadalieva Nodira ISAKOVNA

Docent, Doctor of Philosophy, PhD, Tashkent State Pedagogical University named after Nizami, Faculty of Natural Sciences, Tashkent, Uzbekistan

ORCID ID: 0000-0001-7074-4126

ABSTRACT

The World Health Organization emphasizes that cardiovascular diseases have become epidemic. Most known diseases and extreme conditions are directly or indirectly related to oxygen deficiency. The pathogenetic universality of oxygen deficiency includes the issues of hypoxic disorders in the field of interest of a wide range of specialists in experimental and clinical medicine.

Keywords: phospholipids, hypobaric hypoxia, subcompensated hypobaric hypoxia, decompensated hypobaric hypoxia, phosphatidylcholine, cardiolipin, lysophosphatidylcholine, phosphatidylserine, phosphatidic acid.

DRUG-LOADED ELECTROSPUN POLYMER/CLAY NANOCOMPOSITES FOR DRUG DELIVERY SYSTEMS

Şükran Melda ESKİTOROS-TOGAY

University of Health Sciences, Gulhane Vocational School of Health Services, Department of Pharmacy Services, Ankara, Türkiye

ORCID ID: 0000-0002-7473-8417

ABSTRACT

There has been a growing interest in drug release systems which are essential platforms to optimize drug release [1] and to enhance drug safety and patient compliance by overcoming barriers in drugs and conventional technologies [2]. In order to control drug release, various kinds of carrier materials such as nanofibers have been developed by electrospinning technique. This technique which is a widely investigated one is a simple, useful, cost-effective, and versatile technique for producing nanofibers from polymeric matrix [3]. These nanofibers can be produced from synthetic polymers such as polycaprolactone (PCL), polyvinylpyrrolidone (PVP), poly (lactic acid), poly (lactic-co-glycolic acid)), and polyethylene glycol (PEG) [4]. PCL is a biodegradable and biocompatible polymer; however, its hydrophobic nature and low biodegradation rate limit to be selected as a drug delivery vehicle. Thus, blending with a hydrophilic polymer such as PVP can be helped to solve this problem [2]. PVP is water-soluble and has good biocompatibility, low toxicity, stability, high capacity to interact with different pharmaceuticals. In addition, clays are commonly used materials in the pharmaceutical industry, which improve the mechanical, structural, thermal, and biological features compared to pure polymer composites [5]. In this study, the aim is to develop a novel drug delivery vehicle fabricated from the polymeric matrix by the electrospinning technique. Therefore, neat polymer and polymer/clay nanocomposite nanofibrous membranes were successfully prepared by electrospinning technique. A model antibiotic drug, tetracycline hydrochloride (TCH), was loaded onto the clay and then incorporated into polymer nanofibers. The morphological and physicochemical properties of the fabricated nanofibrous membranes were characterized by SEM, FTIR, and XDR. When the drug release profiles were compared, the release profile of the polymer/clay nanocomposite fibrous membrane showed a more controlled manner than that of the polymer nanofibrous membrane. In conclusion, TCH-loaded polymer/clay nanocomposite nanofibrous membrane can be used as a drug delivery vehicle for controlled drug delivery systems.

Keywords: clay, electrospinning, nanofiber, drug delivery system, synthetic polymer.

ANTİMİKROBİYAL VE YENİLİKÇİ GÖRÜNÜME SAHİP TEKSTİL ÜRÜNLERİNİN GELİŞTİRİLMESİ

DEVELOPMENT OF TEXTILE PRODUCTS WITH ANTIMICROBIAL AND INNOVATIVE APPEARANCE

Emre SAKAN

Ar-Ge Merkez Mühendisi FG Grup Konfeksiyon Sanayi A.Ş. İzmir, Türkiye

ORCID ID: 0009-0004-9841-3686

İrem PALABIYIK

Ar-Ge Merkez Yöneticisi FG Grup Konfeksiyon Sanayi A.Ş. İzmir, Türkiye

ORCID ID: 0000-0003-4707-2362

ÖZET

Tekstil ürünlerinin üretimi ve kullanımı, başlangıcından itibaren insanlık tarihiyle iç içe geçmiştir. Zaman içinde tekstil ürünlerinden beklentiler, sağlık, moda, güvenlik, teknolojik gelişmeler, kullanım kolaylığı ve konfor gibi faktörleri kapsayacak şekilde evrim geçirmiştir. Bu durum, fonksiyonel tekstiller, teknik tekstiller ve akıllı tekstiller gibi kavramların ortaya çıkmasına neden olmuştur. Bu kavramlar, tüketicilerin artan taleplerine cevap verebilmek amacıyla çeşitli malzemelerin işlevselliği üzerinde araştırmalar yapılarak ortaya çıkan leke ve yağ tutmama, yanmazlık, antistatik özellikler gibi özelliklere sahip tekstillerin oluşturulmasını sağlamıştır. Ayrıca, daha yeni yenilikler arasında termal konfor sağlayan, vitamin içeren, antibakteriyel özellikli ve böcek kovucu özelliklere sahip kumaşlar da bulunmaktadır [1]. Bu işlevsel özellikler arasında antibakteriyel özellik, önemli bir konumdadır. Antibakteriyel tekstillerin endüstriyel üretimi, Alman ve Amerikan askerlerin 1930'lu yılların sonlarında üniformalarında koku ve enfeksiyonu önlemek için kullanılan kuaterner amonyum tuzlarıyla başlamıştır [2]. Son yıllarda, özellikle tekstil ürünlerinde bakterilerin neden olduğu hasar ve hoş olmayan kokular gibi sorunları ele almak için antibakteriyel malzemelerin kullanımı büyük önem kazanmıştır. Özellikle doğal liflerden yapılan tekstil malzemeleri, büyük yüzey alanları ve nem tutma kapasiteleri nedeniyle mikroorganizmaların büyümesi için mükemmel bir ortam sağlar [3]. Bu çalışmada mikroorganizmaların yaşamasını engelleyerek insan sağlığını ve güvenliğini sağlarken daha canlı ve dayanıklı bir görünüme sahip yenilikçi tekstil ürünleri geliştirmeyi amaçlanmaktadır. Çalışma kapsamında 10 yıkamaya kadar etkinliğini koruyan örme ürünlerde %90,77, %99,93, 5 yıkamada ise %99,97 oranında bakteri azalması tespit edilmiş olup yenilikçi görünüm için tuşe özellikleri duyusal analiz ve dökümlülük testleriyle tartışılmıştır.

Anahtar kelimeler: Süprem örgü, Antimikrobiyal, Tuşe.

ABSTRACT

The production and use of textile products have been intertwined with human history since its inception. Over time, the expectations from textile products have evolved, encompassing factors such as healthiness, fashionability, safety, technological advancements, convenience, and comfort. This has given rise to the concepts of functional textiles, technical textiles, and smart textiles, which aim to cater to the ever-growing demands of consumers. To meet these expectations, textile manufacturers have explored the functionality of various materials, resulting in the creation of textiles with properties like stain and oil repellency, flame resistance, antistatic capabilities, as well as more recent innovations such as thermal comfort, vitamin-infused fabrics, antibacterial properties, and insect repellency [1]. Among these functional properties, antibacterial functionality is of particular importance. The industrial production of antibacterial textiles originated in the late 1930s when German and American soldiers utilized quaternary ammonium salts to prevent odor and infections in their uniforms [2]. In recent years,

the use of antibacterial materials has gained significant importance, especially in textile products, to address the issues caused by bacteria, such as damage and unpleasant odors. Textile materials, particularly those made from natural fibers, provide an excellent environment for the growth of microorganisms due to their large surface areas and moisture retention capacities [3]. The aim of this study is to develop innovative textile products that provide human health and safety by preventing the survival of microorganisms, while also offering a more vibrant and durable appearance. Within the scope of the study, it has been determined that knitted products maintain a bacterial reduction rate of 90.77% for up to 10 washes, 99.93% for 5 washes, and 99.97% for innovative appearance. The touch properties for innovative appearance have been discussed through sensory analysis and drapeability tests.

Keywords: Single jersey knitting, Antimicrobical, Hand feel.

PROGRAM EVALUATION OF THE ENTERPRISE EXPLOITATION SERVICE PROCESS

Umirov ILKHOMJON

Jizzakh Polytechnic Institute, Faculty of Service, Department of "Vehicle Engineering", Jizzakh, Uzbekistan

ORCID ID: 0000-0003-2329-2256

Umirova GULMIRA

Jizzakh Polytechnic Institute, Faculty of Transport, Department of "Economics and Management" department, Jizzakh, Uzbekistan

ORCID ID: 0000-0002-8865-0774

ABSTRACT

The article describes the most important areas for improving the maintenance of cars, the effectiveness of the development of production and technical bases, the maintenance and repair of passenger cars, and a brief description of the technical characteristics of the car maintenance company.

In turn, cars are systematically serviced, including cleaning and washing, refueling, oil changes, and other operational materials, their technical condition, and a series of preventive and repair work aimed at preventing possible breakdowns. Go prevents malfunctions. In many countries of the world, there are modern car service enterprises that are well established in the service of cars and trade spare parts and materials for them, as well as their maintenance. Construction, expansion, reconstruction, and technical re-equipment of existing motor transport enterprises must meet the modern requirements of scientific and technical development and the conditions of the transition of the economy to new market relations.

Secondly, the industrial infrastructure-first of all, the developed system of roads and railways-is an important condition and factor in reducing the total production costs. This, in turn, enhances the competitiveness of the products and the economy as a whole. In order to ensure the accelerated development of modern production and social infrastructure and to create favorable conditions for consistent and sustainable economic growth, a special program "On Additional Measures for Further Development of Production and Social Infrastructure in 2019" was adopted, and its implementation was under strict control. It is desirable to determine the annual production program for the enterprise using the coefficients of avtomobile in conjunction with the accounting of technical preparation coefficients. Inadequate points of equipment for the lack of conditions for the complete performance of technological processes in the regions and workshops at the enterprise. Should improve the exploitation service at the enterprise. This paper provides methodical recommendations and uses their results to improve traffic safety in transport.

Keywords: car, traffic safety, traffic, traffic signs, dangerous site.

U.S. BANKNOTES RECOGNITION BY SURF FEATURES

Mashar Cenk GENÇAL

Assistant Professor, Ardahan University, Faculty of Engineering, Department of Computer Engineering, Ardahan, Türkiye

ORCID ID: 0000-0002-1317-3950

ABSTRACT

With the advancement of technology, great progress has been made in the studies on artificial intelligence, which has led to innovations in the use of computer vision for recognition an object. However, technological developments have also led to a change in the tricks that can be made on money. These tricks made it insufficient to manually or visually check whether a banknote is counterfeit; therefore, systems that could control banknotes have been needed. Furthermore, the recognition of the currencies used in commercial transactions by a system is great importance as it will enable the existing monetary transactions to take a shorter time. For these reasons, studies on banknote recognition processes have become important. Nowadays, most of works that have been done in the area of banknote recognition are based on machine learning approaches or computer vision approaches, especially Scale Invariant Feature Transform (SIFT) and Speeded-up Robust Features (SURF). In this paper, the algorithm, we have developed, utilizes SURF method to recognize American banknotes in a photograph. The algorithm detects different banknotes in the photo and shares the total amount with the user. To test the success of the algorithm, it has been examined under the different cases: only one banknote, more than one banknotes, overlapping banknotes and a folded banknote. According to the obtained results, the algorithm have detected banknotes and showed total amount of money in the photos correctly. Thus, it is obvious to say that the algorithm produces adequate results in terms of performance.

Keywords: Banknote recognition, computer vision, SURF

TEKNOLOJİDE YÖNETİŞİM VE FİNANSAL TEKNOLOJİ SEKTÖRÜNDEN BİR UYGULAMA

GOVERNANCE IN TECHNOLOGY AND AN APPLICATION FROM THE FINANCIAL TECHNOLOGY SECTOR

Kübra KÖSEOĞLU

Harran Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Şanlıurfa, Türkiye

ORCID ID: 0009-0004-8369-8826

ÖZET

Dünya çapında kamu ve özel sektör farketmeksizin bilgi teknolojilerinde (BT) yoğun bir artış yaşanmaktadır. Bu artışla birlikte kurumsal iş süreçleri BT ile bağımlı hale gelmiştir. Bu bağımlılık bir tarafa, kurumun öncelikleri ile BT önceliklerinin çatışması, BT risklerinin anlaşılamaması, kaynak israfı ve bitmeyen BT projeleri gibi ciddi sorunlar kavramın önemini ve kavram üzerindeki tartışmaları artırmıştır. BT yönetişimi yönetim kurulu ve üst düzey yöneticilerin sorumluluğunda olan kurumsal yönetişimin ayrılmaz bir parçasıdır. BT yönetişimi liderlik ve organizasyonel yapıları içerir. Kuruluşun BT'sini sağlamak için kuruluşun stratejilerini sürdürür ve uyum sağlar. Aynı zamanda kuruluşun stratejileri ve BT arasındaki stratejik uyumu sağlar. BT Yönetişimi dört kategoriye ayrılır. Bu boyutlar BT stratejisi, değer sunumu, risk yönetimi ve performans ölçümüdür.

BT'nin değişen iş ihtiyaçlarına karşı başarılı olması için, kurum yönetiminin bir iç kontrol sistemi veya çerçeve koyması gerekir. Bu bağlamda BT yönetişimi için kullanılan global model ve metodlar açıklanmıştır. COBIT ve ITIL bunlardan başlıcalarıdır.

Blok zincir uygulamaları ile birlikte finansal teknoloji (fintek) yukarı yönde hareket almıştır. Finansal teknoloji (Fintek), finans sektöründe yenilikçi ürün ve hizmetler sağlamak için teknolojinin uygulanmasıdır. Fintek pazarının gelişimi, çeşitli ve verimli finansal hizmetlerin sağlanmasında müşteri deneyimini geliştirerek tüketicilere yenilikçi çözümler sağlamıştır. Küresel mali krizler, sosyal medya, yapay zeka ve veri analitiği gibi çağdaş teknolojik yeniliklerin kullanımıyla birleştiğinde Fintek yeni bir paradigmaya dönüşmüştür. Gelişen ve büyüyen fintek piyasası, organize piyasalardan farklı olarak, belirgin bir düzenlemeye ve denetime tabi değildir. Bu ekosistemindeki girişimlerin işleyişi ve yapısı da diğer para ve sermaye piyasaları gibi denetlenmeli ve belirli yaptırımlar uygulanmalıdır. Kontrol edilebilme ve denetleme açısından belirli teknik ve teknolojik gereksinimlerin sağlanması, hizmet ve servislerin sürdürülebilmesi için de önemlidir. Çalışmada bir fintek firmasında COBIT uyumluluk çalışması planlanmıştır. Uygulama sonucunda sonuçlar değerlendirilecektir.

Anahtar kelimeler: Yönetişim, Denetim, COBIT, ITIL, Fintek

ABSTRACT

Worldwide, there is an intense increase in information technology (IT) regardless of the public and private sectors. With this increase, corporate business processes have become dependent on IT. Apart from this dependency, serious problems such as the conflict between the priorities of the organization and IT, misunderstanding of IT risks, waste of resources and unfinished IT projects have increased the importance of the concept and the discussions on the concept. IT governance is an integral part of corporate governance, which is the responsibility of the board of directors and senior executives. IT governance includes leadership and organizational structures. Maintains and adapts the organization's strategies to ensure the organization's IT. It also ensures strategic alignment between the organization's strategies and IT. IT Governance falls into four categories. These dimensions are IT strategy, value delivery, risk management and performance measurement.

For IT to be successful against changing business needs, enterprise management must put in place an internal control system or framework. In this context, the global models and methods used for IT governance are explained. COBIT and ITIL are the main ones.

With the blockchain applications, financial technology (fintech) has taken an upward movement. Financial technology is the application of technology to provide innovative products and services in the financial industry. The development of the fintech market has provided innovative solutions to consumers by improving the customer experience in the provision of diverse and efficient financial services. When the global financial crises combined with the use of contemporary technological innovations such as social media, artificial intelligence and data analytics, Fintech has turned into a new paradigm. The developing and growing fintech market, unlike organized markets, is not subject to any specific regulation and supervision. The operation and structure of the enterprises in this ecosystem should be supervised like other money and capital markets and certain sanctions should be applied. Providing certain technical and technological requirements in terms of controllability and supervision is also important for the maintenance of services and services. In the study, a COBIT compliance study was planned in a fintech company. At the end of the application, the results will be evaluated.

Keywords: Governance, Audit, COBIT, ITIL, Fintech

ПЕРСПЕКТИВЫ ИСПОЛЬЗОВАНИЯ КОМПЛЕКСНОЙ ДОБАВКИ ДЛЯ КЕРАМИЧЕСКОГО ШЛИКЕРА

PROSPECTS FOR THE USE OF A COMPLEX ADDITIVE FOR CERAMIC SLICK

Khakimova Gulnoz NİGMANOVNA

*PhD, Assoc. Prof.**,** Tashkent Chemical-Technological Institute, Faculty of Chemical Technology of Inorganic Substances, Department of technological machinery and equipment, Tashkent, Uzbekistan*

ORCID ID: 0000-0001-9619-1902

АННОТАЦИЯ

Производство керамических плиток состоит из различных технологических процессов, основными из которых являются механические, гидромеханические, тепловые, массообменные и химические. Для осуществления каждого из них используется большое количество специального оборудования.

Перспективы развития и внедрения современных технологий сушки и сушильного оборудования во многом определяются созданием новых методик их расчета и математических моделей, учитывающих статику процесса сушки, взаимосвязанный перенос влаги и теплоты внутри влажного тела, а также гидродинамическую обстановку в аппарате.

В статье приведены результаты исследования влияния разжижающих добавок триполифосфата натрия, и фосфоната натрия на реологические свойства керамического шликера, применяемого в производстве плиток для стенов. Показана перспективность использования комплексного разжижителя, в состав которого входит фосфонат натрия и силикат натрия.

В данной работе изучены реологические свойства керамического шликера плиток для стен при использовании в качестве понизителей вязкости ТПФН, фосфоната натрия.

Для приготовления шликера использовали каолин (необогащенное) Ангренского месторождения, полевой шпат Чиракского месторождения, кварцевый песок Таваксайского месторождения, известняк Жиззакского месторождения, тальк Каракалпакского. Шликер готовили методом мокрого помола всех компонентов в лабораторной шаровой мельнице Speedy. Тонина помола шликера определялась по величине остатка на сите № 0063 на основании методики и находилась в пределах 1,5–2,0%. Вязкость шликера в градусах Энглера (°E) и коэффициент загустеваемости (Кз) оценивали по скорости истечения из воронки вискозиметра Энглера после 30 с и 30 мин выдержки по методике.

Определено оптимальное соотношение компонентов разжижающей добавки, обеспечивающее требуемые реологические свойства керамических шликеров.

Ключевые слова: Интенсификация, понизитель вязкости, керамический шликер, реологический свойства шликера, термического обезвоживания, триполифосфат натрия, коэффициент загустеваемости

ABSTRACT

The production of ceramic tiles consists of various technological processes, the main of which are mechanical, hydromechanical, thermal, mass transfer and chemical. For the implementation of each of them, a large number of special equipment is used.

Prospects for the development and implementation of modern drying technologies and drying equipment are largely determined by the creation of new methods for their calculation and mathematical models that take into account the statics of the drying process, the interconnected transfer of moisture and heat inside the wet body, as well as the hydrodynamic situation in the apparatus.

The article presents the results of a study of the effect of thinning additives sodium tripolyphosphate and sodium phosphonate on the rheological properties of ceramic slip used in the production of wall tiles. The use of a complex thinner containing sodium phosphonate and sodium silicate is shown to be promising.

In this paper, the rheological properties of the ceramic slip of tiles for walls were studied when using STPP, sodium phosphonate as viscosity reducers.

To prepare the slip, kaolin (unenriched) from the Angren deposit, feldspar from the Chirak deposit, quartz sand from the Tavaksay deposit, limestone from the Jizzak deposit, and talc from the Karakalpak deposit were used. The slurry was prepared by wet grinding all components in a Speedy laboratory ball mill. The grinding fineness of the slip was determined by the amount of residue on sieve No. 0063 on the basis of the methodology and was in the range of 1.5–2.0%. The viscosity of the slip in degrees Engler (°E) and the coefficient of thickening (Kz) were evaluated by the rate of flow from the funnel of the Engler viscometer after 30 s and 30 min exposure according to the method.

The optimal ratio of the thinning additive components, which provides the required rheological properties of ceramic slurries, has been determined.

Keywords: Intensification, viscosity reducer, ceramic slip, slip rheological properties, thermal dehydration, sodium tripolyphosphate, thickening factor

SELECTING THE PARAMETERS THAT MINIMIZE THE ANGULAR DISTORTION IN THE WELDING PROCESS WITH THE ENTROPY METHOD WITHIN THE SCOPE OF MULTI-CRITERIA DECISION MAKING

Ezgi DOĞAN

PhD-c., Marmara University, Institute of Pure&Applied Sciences, Mechanical Engineering Department, Istanbul, Türkiye

ORCID ID: 0000-0003-0207-7178

Ahmet FEYZİOĞLU

Assoc. Prof. Dr., Marmara University, Faculty of Technology, Mechanical Engineering Department, Istanbul, Türkiye

ORCID ID: 0000-0003-0296-106X

Hüseyin HALİLOĞLU

PhD-c., Marmara University, Institute of Pure&Applied Sciences, Mechanical Engineering Department, Istanbul, Türkiye

ORCID ID: 0000-0002-7555-4492

ÖZET

Kaynak yöntemleri iş parçalarına lokal ısıtma yaparak birleştirme gerçekleşme işlemidir. Kaynak prosesinde seçilen her kaynak parametresi, kaynak edilecek iş parçasına transfer olacak ısı girdisi miktarını belirlediği için çok büyük öneme sahiptir. Kaynak parametreleirnin seçimi, kaynak sırası ve kaynak sonrasındaki iç yapıyı tayin etmektedir. Kaynak prosesinde, birleşme bölgesinin her ayrı noktasında heterojen ısıtma ve soğutma çevrimleri gerçekleştiği için, kaynak bölgesinde heterojen genleşme ile büzülmeler meydana gelir ve bu şekilde kaynak yapılan iş parçası üzerinde iç gerilmeler oluşur. Termal gerilmelerin yol açtığı iç gerilmelerin etkisi ile kaynak yöntemi ile birleştirilen iş parçasında istenmeyen kalıcı şekil değişimleri meydana gelir. Bu kalıcı şekil değişimlerden biri de kaynaklı parçalarda meydana gelen açısal çarpılmalardır. Açısal çarpılmalar kaynak sonrasında yapıda istenen yapısal bütünlüğü ve parça geometrisine zarar veren durumlar olduğu için, kaynaklı komponentlerde açısal çarpılmanın önceden tahmini, minimize edilmesi ve ortadan kaldırılması büyük önem arz etmektedir. Kaynak parametrelerinin belirlenmesi sonrasında, yapıda meydana gelebilecek olan açısal çarpılma miktarı önceden hesaplanabilir ve tahmin edilebilir. Bu çalışma kapsamında, ark kaynak yöntemlerinden özlü tel gaz altı kaynak yöntemi ile kaynak edilen S235JR kalitede çelik levhalarda kaynak parametrelerinin açısal çarpılma üzerindeki etkilerinin incelenmesi için öncelik olarak deneysel çalışmalar yapılmış ve bu deneysel çalışmalardan elde edilen kaynak parametreleri ile ilgili veriler Çok Kriterli Karar Verme yöntemlerinden ağırlıklandırma metodu olarak kullanılan Entropy yöntemi ile derecelendirilmiştir. Çalışmanın yeniliği, açısal çarpılmaya karşı kaynak işlemi öncesinde ayarlanacak olan kaynak parametrelerinin Entropy MCDM yöntemleri ile önceliklendirilmesinden ileri gelmektedir. Kaynak sürecini etkileyen parametreler, primer ve sekonder kaynak parametreleri olarak sınıflandırılmaktadır. Primer kaynak parametrelerinin kayanak prosesine müşterek etkisinin incelenmesi için kurulmuş olan deney düzeneğinde her bir kaynak parametresi ile kaynak yapıldıktan sonra açısal çarpılma miktarı dijital komparatör ile ölçülmüştür. Bu sonuçlar, Çok Ölçütlü Karar Verme Yöntemleri'nden ağırlıklandırma metodu olarak olarak kullanılan Entropy yöntemi ile kıyaslanmıştır.

Anahtar kelimeler: Açısal çarpılma, Birincil Kaynak Parametreleri, Çok Ölçütlü Karar Verme, Entropy Ağırlıklandırma

ABSTRACT

Welding methods are the process of joining the workpieces by local heating. Each welding parameter selected in the welding process is of great importance as it determines the amount of heat input that will be transferred to the workpiece to be welded. The selection of welding parameters determines the welding sequence and the internal structure after welding. In the welding process, since heterogeneous heating and cooling cycles take place at each separate point of the joint zone, heterogeneous expansion and contraction occur in the weld area and internal stresses occur on the welded workpiece. With the effect of internal stresses caused by thermal stresses, undesirable permanent deformations occur in the workpiece joined by welding method. One of these permanent deformations is the angular distortions that occur in the welded parts. Since angular distortions are the situations that damage the desired structural integrity and part geometry in the structure after welding, it is of great importance to predict, minimize and eliminate angular distortion in welded components. After the welding parameters are determined, the amount of angular distortion that may occur in the structure can be calculated and estimated in advance. Within the scope of this study, primarily experimental studies were carried out to examine the effects of welding parameters on angular distortion in S235JR quality steel plates welded by cored wire gas metal arc welding method, and the data related to welding parameters obtained from these experimental studies were weighted from Multi-Criteria Decision Making methods. It was graded by the Entropy method, which is used as the method of The novelty of the study comes from prioritizing the welding parameters to be adjusted before the welding process against angular distortion with Entropy MCDM methods. The parameters affecting the welding process are classified as primary and secondary welding parameters. In the experimental setup, which was established to examine the joint effect of primary welding parameters on the welding process, the amount of angular distortion was measured with a digital comparator after welding with each welding parameter. These results were compared with the Entropy method, which is used as a weighting method from Multi-Criteria Decision Making Methods.

Keywords: Angular distortion, Primary Welding Parameters, Multi-Criteria Decision Making, Entropy Method

TEMPERATURE STRESS, NUTRITIONAL REQUIREMENTS AND NUTRITION APPLICATIONS AGAINST STRESS IN POULTRY

Esra GÜRSOY

Ağrı İbrahim Çeçen Üniversitesi, Celal Oruç Hayvansal Üretim Yüksekokulu, Türkiye

ORCID ID: 0000-0002-4697-7365

Tugay AYAŞAN

Osmaniye Korkut Ata Üniversitesi/Kadirli Uygulamalı Bilimler Fakültesi/Organik Tarım İşletmeciliği Bölümü/Organik Tarım İşletmeciliği Anabilim Dalı, Türkiye

ORCID ID: 0000-0001-7397-6483

ABSTRACT

In this study, what stress is in poultry, stress factors and the negative effects of stress in poultry are emphasized. Stress factors include climatic, environmental, nutritional, physiological, physical, psychological, social and pathological factors. Stress factors include climatic, environmental, nutritional, physiological, physical, psychological, social and pathological factors. Symptoms of birds experiencing stress include increased mortality, decreased appetite, retarded growth, and greater susceptibility to diseases. These situations also increase production costs. In addition, it has been stated that stress has negative effects on the nutrient requirements of birds. Finally, nutritional strategies that can be applied to combat stress are also highlighted. High temperatures affect the metabolism of animals, causing changes in their nutrient requirements. These changes affect the amount and ratio of nutrients that animals need to regulate body temperature and maintain bodily functions. In this review, current feeding practices against heat stress in poultry were presented.

Keywords: Poultry, heat stress, nutrient requirement

ÇEVRE DOSTU UYGULAMALAR İÇİN ÇÖREK OTU POSASI TAKVİYELİ BİYOKOMPOZİTLERİN GELİŞTİRİLMESİ VE KARAKTERİZASYONU

DEVELOPMENT AND CHARACTERIZATION OF BLACK CUMIN CAKE REINFORCED BIOCOMPOSITES FOR ECO-FRIENDLY APPLICATIONS

Müslüm ALTUN

Dr. Öğr. Üyesi, Adıyaman Üniversitesi, Mühendislik Fakültesi, Çevre Mühendisliği Bölümü, Adıyaman, Türkiye

ORCID ID: 0000-0003-2691-7370

ÖZET

Kompozit malzemeler, olağanüstü mekanik özellikleri, dayanıklılıkları ve hafif yapıları nedeniyle yaygın olarak kullanılmaktadır. Doğal lifler, yenilenebilir yapıları, biyolojik olarak parçalanabilirlikleri ve maliyet etkinlikleri nedeniyle kompozitlerde potansiyel takviyeler olarak büyük ilgi görmüştür. Bu lifler arasında çörek otu posası (ÇOP), etkileyici mukavemeti, sertliği ve termal kararlılığı ile öne çıkmaktadır. Son yıllarda, polietilen (PE), mükemmel mekanik özellikleri, düşük yoğunluğu ve kimyasal direnci sebebiyle kompozitler için önde gelen bir termoplastik polimer olarak ortaya çıkmıştır. Doğal liflerle güçlendirilmiş PE kompozitler, otomotiv parçaları, ambalaj malzemeleri ve inşaat bileşenleri dahil olmak üzere çeşitli uygulamalar için kapsamlı bir şekilde araştırılmıştır. Çeşitli sektörlerde sürdürülebilir malzemelere yönelik artan talep, yenilenebilir kaynaklardan yeni takviyeler keşfetmeye yönelik araştırma çabalarını teşvik etmiştir. Bu bağlamda söz konusu çalışma, iyileştirilmiş mekanik özelliklere sahip çevre dostu kompozitlere olan ihtiyacı karşılamak için ÇOP ile güçlendirilmiş bir PE kompozitinin geliştirilmesine ve karakterizasyonuna odaklanmaktadır. Endüstrinin çeşitli alanlarında kullanılan çörek otu tohumu yağı çıkarma işleminden bol miktarda tarımsal atık ÇOP elde edilmektedir. Bu yeterince kullanılmayan atık malzemenin kullanıldığı çalışmada, çevre kirliliğinin azaltılmasına ve döngüsel ekonomi ilkelerinin desteklenmesine katkıda bulunulmaktadır. Bir eriyik karıştırıcı kullanılarak bir uyumlaştırıcı olarak maleik anhidrit aşılanmış PE (PE-g-MA) ile birlikte düşük yoğunluklu bir polietilen matrisine uygun boyut dağılımına getirilmiş ÇOP eklenmiştir. Takviyenin optimal ağırlık oranını belirlemek için sistematik araştırmalar yapılmış ve bu da mekanik güç ve maliyet etkinliğinin dengeli bir kombinasyonuyla sonuçlanmıştır. ÇOP ile güçlendirilmiş PE kompozitin mekanik özellikleri, çekme, sertlik, morfolojik, diferansiyel taramalı kalorimetri (DSC) ve termogravimetrik analiz (TGA) ölçümlerini kapsayan kapsamlı bir dizi testle değerlendirildi. Sonuçlar, yalın matrise kıyasla bu özelliklerde önemli gelişmeler sergiledi. Bu araştırma, otomotiv bileşenleri, inşaat malzemeleri ve paketleme endüstrileri dahil olmak üzere çeşitli mühendislik uygulamaları için sürdürülebilir bir çözüm sunan ÇOP'u PE kompozitlerde yenilenebilir ve çevre dostu bir takviye olarak kullanmanın yollarını açmaktadır.

Anahtar kelimeler: Çörek otu posası; Polietilen kompozit; Doğal lif takviyesi; sürdürülebilir malzemeler.

ABSTRACT

Composite materials are widely utilized for their exceptional mechanical properties, durability, and lightweight nature. Natural fibers have gained significant attention as potential reinforcements in composites due to their renewable nature, biodegradability, and cost-effectiveness. Among these fibers, black cumin cake (BCC) stands out for its impressive strength, stiffness, and thermal stability. In recent years, polyethylene (PE) has emerged as a prominent thermoplastic polymer for composites, attributed to its excellent mechanical properties, low density, and chemical resistance. PE composites reinforced with natural fibers have been extensively studied for various applications, including automotive parts, packaging materials, and construction components. The escalating demand for sustainable materials across diverse sectors has spurred research efforts toward exploring novel reinforcements from

renewable resources. This study focuses on the development and characterization of a BCC-reinforced PE composite to address the need for eco-friendly composites with enhanced mechanical properties. BCC, an abundant agricultural waste derived from the black cumin seed oil extraction process, possesses unique mechanical properties. By harnessing this underutilized waste material, the study contributes to reducing environmental pollution and promoting circular economy principles. Incorporating black cumin cake particles into a low-density polyethylene matrix, along with maleic anhydride grafted PE (PE-g-MA) as a compatibilizer, was achieved using a melt mixer. Systematic investigations were conducted to determine the optimal weight fraction of the reinforcement, resulting in a balanced combination of mechanical strength and cost-effectiveness. The mechanical properties of the BCC-reinforced PE composite were evaluated through a comprehensive series of tests encompassing tensile, hardness, morphological, differential scanning calorimetry (DSC), and thermogravimetric analysis (TGA) measurements. The results exhibited significant enhancements in these properties compared to the neat matrix. This research opens avenues for utilizing BCC as a renewable and eco-friendly reinforcement in PE composites, offering a sustainable solution for diverse engineering applications, including automotive components, construction materials, and packaging industries.

Keywords: Black cumin cake; Polyethylene composite; Natural fiber reinforcement; Sustainable materials.

ESTIMATION OF BUILDING HEIGHT FROM ICESat-2/ATLAS AND AIRBORNE LiDAR DATA USING MACHINE LEARNING ALGORITHMS

Müge AĞCA

Dr. Öğr. Üyesi, İzmir Kâtip Çelebi Üniversitesi, Mühendislik ve Mimarlık Fakültesi, Harita Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0003-0190-7280

Aslıhan YÜCEL

Harita Mühendisi, İzmir Kâtip Çelebi Üniversitesi, Mühendislik ve Mimarlık Fakültesi, Harita Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-6917-942X

Ali İhsan DALOĞLU

Harita Yüksek Mühendisi, İzmir Kâtip Çelebi Üniversitesi, Mühendislik ve Mimarlık Fakültesi, Harita Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-3274-0156

Efdal KAYA

Harita Mühendisi, İskenderun Teknik Üniversitesi, İskenderun Meslek Yüksekokulu, Harita ve Kadastro, İzmir, Türkiye

ORCID ID: 0000-0002-5553-0143

Mevlüt YETKİN

Prof. Dr, İzmir Kâtip Çelebi Üniversitesi, Mühendislik ve Mimarlık Fakültesi, Harita Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0003-3438-1801

Femin YALÇIN KÜÇÜKBAYRAK

Prof. Dr., İzmir Kâtip Çelebi Üniversitesi, Mühendislik ve Mimarlık Fakültesi, Mühendislik Bilimleri, İzmir, Türkiye

ORCID ID: 0000-0003-0602-9392

ABSTRACT

Urban areas have global implications in today's world, with the growth and development of cities. While the expansion of cities provides favorable conditions for people, it also leads to negative impacts. To create more livable cities, growth and development can be modeled in three dimensions, with building heights playing a key role. The objective of this study is to calculate building heights in urban areas using ICESat-2/ ATLAS and airborne LiDAR data, using different machine learning algorithms. The airborne LiDAR data were subjected to necessary filtering and classification. Digital elevation models (DEMs) and digital surface models (DSMs) with a resolution of one meter were created from the classified data. ICESat-2/ATLAS data, ATL03 and ATL08 were integrated to form a meaningful unified data set based on location and surface information. Horizontal and vertical coordinate differences exist between ICESat-2 and airborne LiDAR data. ATL03 and ATL08 data were overlaid with airborne LiDAR data to determine these differences. Given a reported horizontal positioning error of 6.5 meters from ICESat-2/ ATLAS, all ATL03 and ATL08 photons were shifted by 6.5 meters. ICESat-2/ ATLAS data will be classified using supervised and unsupervised machine learning algorithms, including K-Nearest Neighbors (KNN), Random Forest (RF), Support Vector Machines (SVM), Artificial Neural Networks (ANN), and Random Sample Consensus (RANSAC). Selected models will be used for

classification, distinguishing between ground and above-ground points. Building data will be extracted by excluding areas that overlap with ICESat-2/ ATLAS data. Building classes will be derived from the above-ground points and compared to the ground-based data to establish height relationships. The potential use of the extracted building heights to derive urban geometry will be evaluated.

Keywords: ICESat-2/ATLAS, airborne LiDAR, machine learning algorithm, building height

EXPERIMENTAL STUDY OF BIFACIAL SOLAR PHOTOVOLTAIC SYSTEMS IN SNOWY ENVIRONMENTS

Hasan Hüseyin ÇOBAN

Ardahan Üniversitesi, Elektrik Elektronik Mühendisliği Bölümü, 75002. Ardahan, Türkiye

ORCID ID: 0000-0002-5284-0568

ABSTRACT

In order to maximize the energy produced by a solar farm while occupying the same amount of space, the Photovoltaics (PV) sector has successfully developed and used bifacial solar modules. With the latest generation of bifacial photovoltaic panels, which further make use of the light reflected from the ground to the backside, it is feasible to achieve more energy per unit area. The potential of bifacial photo voltaics for snowy regions is studied from an economic and technical standpoint in this experimental feasibility study. The results demonstrate that the system may generate much more energy than conventional systems in the city of Ardahan, Turkey during a full year from June 2022 to May 2023. The bifacial south-facing systems generated 8.97% more energy than monofacial modules. By installing the modules several meters above the ground, the snow can slide off unhindered and is also exposed to the wind. In contrast to roof systems, the accumulation of snow in the lower area of the module segments can be avoided.

Keywords: Bifacial photovoltaics, Solar PV, Design optimization, Albedo, Snow

THERMAL AND CONCENTRATION STRATIFICATION EFFECTS OF BIOCONVECTIVE WILLIAMSON FLUID FLOW CONSISTING TINY PARTICLES WITH GYROTACTIC MICROORGANISMS

Ephesus O. FATUNMBİ

Department of Mathematics and Statistics, Federal Polytechnic, Ilaro, Nigeria

Olumuyiwa A. AGBOLADE

Department of Mathematics and Statistics, Federal Polytechnic, Ilaro, Nigeria

ABSTRACT

The bioconvective transport phenomenon due to stratification, swimming microorganisms, and tiny nanoparticles is used in many industries and engineering activities. In this context, the current study examines the bioconvection flow of a reactive hydromagnetic Williamson nanofluid configured on an expanded two-dimensional porous device under the influence of Soret and Dufour coupled with an exponentially based heat source. The thermal conductivity is modeled as a linear function of temperature, while thermal and concentration stratification are fixed at the wall boundary. With the help of relevant similarity transformation variables, the transport equations have been reduced from partial to ordinary differential equations and then solved by means of the shooting method alongside the Runge-Kutta Fehlberg integration scheme. Various graphs and tables indicate how the analysis affects the transport fields' non-dimensional quantities. Mixed convection and thermophoresis increase heat transmission, while Brownian motion improves mass transfer. Thermo-migration of small particles decreases motile microorganism density, although thermal stratification increases temperature distribution.

Keywords: Thermal stratification; Concentration stratification; Bioconvective flow; Williamson fluid; Gyrotactic microorganisms

SEZGİSEL BULANIK REGRESYON ANALİZİ İÇİN BİR RASGELE SAYI TÜRETME YAKLAŞIMI

A RANDOM NUMBER GENERATION APPROACH FOR INTUITIONISTIC FUZZY REGRESSION ANALYSIS

Tolga BOZDAĞ

Yüksek Lisans Öğrencisi, Ege Üniversitesi, Fen Fakültesi, İstatistik Bölümü, İzmir, Türkiye

ORCID ID: 0000-0003-4592-4269

Ali MERT

Ph.D., Ege Üniversitesi, Fen Fakültesi, İstatistik Bölümü, İzmir, Türkiye

ORCID ID: 0000-0002-6806-935X

ÖZET

Regresyon Analizi konusu İstatistiksel Modelleme sahasının en önemli ve en çok uygulama alanı olan konularından biridir. Günümüzde veri kaynaklarının çok ve çeşitli olması sebebiyle erişilebilen veri tipleri de farklılaşmıştır. Bunun sonucu olarak; Regresyon Analizinin ihtiyaç duyduğu nümerik verinin yanında nümerik olmayan tipte veriler de toplanmaya devam etmektedir. Elde bulunan nümerik olmayan verilerin kullanıldığı modeller geliştirmek ve bu verilere matematiksel şablonlar oluşturmak için birçok farklı yaklaşım son yıllarda önerilmiştir. Bulanık Mantık ve ardından geliştirilen Sezgisel Bulanık Mantık bu yaklaşımlar arasındadır. Sezgisel Bulanık Mantık ile matematiksel kalıba dökülen veri daha ileri analizlerde kullanılabilir hale gelir. Bu analizlerden bir tanesi de Sezgisel Bulanık Regresyon Analizidir. Birçok farklı bilim insanı bu sahada farklı teknikler geliştirmiştir. Parvathi ve ark.[1], net (crisp) açıklayıcı değişkenler ve yanıt değişkenlerini kullanarak bir sezgisel bulanık doğrusal regresyon modelini formüle etmek için matematiksel bir programlama yaklaşımı önerdiler. Bu modelde net sayıları kendi önerdikleri model yardımıyla önce sezgisel bulanık sayılara dönüştürdüler ve bu dönüştürdükleri sezgisel bulanık sayıları da kullanarak önerdikleri matematiksel modelde kullandılar. Ardından bu öneride öngörülen sezgisel bulanık sonuçları elde ettikten sonra da tahmin edilen sonuçları dahil edebilmek için alt ve üst sınırları belirlediler. Bir diğer sezgisel bulanık sayı çalışması M. Arefi ve S.M. Taheri [2] tarafından yapılmıştır. Bu çalışmada en küçük kareler yöntemine dayalı olarak, kesin olmayan yani bulanık niceliklerin regresyon modellemesi peoblemine ilişkin yeni bir yaklaşım önerilmiştir. Bu yaklaşımda temel olarak hem açıklayıcı değişken(ler)in hem de yanıt değişkeninin ve ayrıca modelin parametrelerinin varolan verilerinin, Atanassov'un sezgisel bulanık sayıları önermesine uygun olduğu varsayılmıştır. Bu çalışmalarında uyum iyiliğini araştırmak için benzerlik ölçüsü ve karesel hatalara dayalı olarak iki endeks önerilmişti. Gerçek bir veri seti kullanarak, önerilen yaklaşımın uygulamasını bazı özelliklerin modellemesinde incelemişlerdir. Dahası; elde ettikleri modelin tahmin yeteneğini çapraz doğrulama yöntemi ile değerlendirmişlerdir. Bir diğer çalışmada Kızılaslan ve arkadaşları [3] sezgisel bulanık küme ve sırt (ridge) regresyon ile bazı modelleme sorunlarını ortadan kaldırmayı hedeflemişlerdir. Önerdikleri yöntem, tip-1 bulanık fonksiyon tabanlı sezgisel bulanık sırt regresyon fonksiyonlarıdır ve üye olma ve üye olmama değerlerini Chaira'nın sezgisel bulanık C-ortalamaları (IFCM) kümeleme algoritması ile elde etmişler ve çoklu doğrusal bağlantı sorununu ortadan kaldırmayı amaçlamışlardır. Geliştirilen teorik tekniklerin performanslarını simülasyon aracılığı ile karşılaştırmak için çokça veri setlerine ihtiyaç vardır. Ancak bu miktarda veri bulmak veya bunları türetmek zahmetli bir süreçtir. Yukarıda kısaca özetlenen bilimsel çalışmalarda kullanılabilecek sentetik verilerin türetilebilmesi bir yaklaşım bu çalışmada önerilmiştir. Ardından bu yaklaşım Python programlama dilinde kodlanmıştır. Bu kod ile farklı dağılım parametre değerleri için türetilmiş verilerin grafikleri çalışmada sunulmuştur.

Anahtar kelimeler: Rasgele Sayı Türetme, Regresyon Analizi, Sezgisel Bulanık Sayı.

ABSTRACT

Regression Analysis is one of the most important and widely applied topics in the field of Statistical Modeling. Nowadays, due to the abundance and variety of data sources, the types of data that can be accessed have also diversified. As a result, in addition to the numerical data required by Regression Analysis, alpha-numerical types of data are continuously collected. Many different approaches have been suggested in recent years to develop models using the available alpha-numerical data and to create mathematical aaproaches that are suitable for these data. Fuzzy Logic and the subsequently developed Intuitionistic Fuzzy Logic are among these approaches. Such data that is molded into mathematical structures by using Intuitionistic Fuzzy Logic becomes available for further complex analysis. One of these analyses is Intuitionistic Fuzzy Regression Analysis. Many different scientists have developed different techniques in the field. Parvathi et al. [1] proposed a mathematical programming approach to formulate an Intuitionistic Fuzzy Linear Regression Model using crisp explanatory variables and response variables. In this model, they first transformed the crisp numbers into intuitionistic fuzzy numbers with the help of their proposed model and used these transformed intuitionistic fuzzy numbers in their proposed mathematical model. Then, after obtaining the intuitionistic fuzzy results predicted in this proposal, they determined the lower and upper bounds to include the predicted results. Another intuitionistic fuzzy number study was done by M. Arefi and S.M. Taheri [2]. In this study, a new approach to the problem of regression modeling of imprecise, i.e. fuzzy, quantities based on the least squares method was proposed. In this approach, it is basically assumed that the existing data of both the explanatory variable(s) and the response variable, as well as the parameters of the model, are supposed to be suitable with Atanassov's intuitionistic fuzzy numbers proposition. In their study, in order to investigate the goodness of fit of the model; two indices were proposed based on similarity measure and squared errors. Using a real data set, they examined the application of the proposed approach in modeling some features, Moreover; they evaluated the predictive ability of the obtained model by cross-validation method. In another study, Kızılaslan et al. [3] aimed to eliminate some modelling problems with intuitionistic fuzzy clustering and ridge regression. Their proposed method is type-1 fuzzy function-based intuitionistic fuzzy ridge regression functions and they obtained the membership and non-membership values with Chaira's intuitionistic fuzzy C-means (IFCM) clustering algorithm and aimed to eliminate the multicollinearity problem. In order to compare the performance of the theoretically developed techniques through simulation, large data sets are required. However, finding or generating this amount of data is a laborious process. In this study, we propose an approach to generate synthetic data that can be used in these scientific studies shortly summarized above. This approach is then coded in Python programming language. With this code, graphs of the generated data for different distribution parameter values are presented in the study.

Keywords: Generating Random Number, Regression Analysis, Intuitionistic Fuzzy Number.

KÜME-DEĞERLİ KRASNOSEL'SKİİ TİPİ DENKLEMLER ÜZERİNE BİR NOT

A NOTE ON SET-VALUED KRASNOSEL'SKII TYPE EQUATIONS

Cesim TEMEL

Prof., Van Yüzüncü Yıl Üniversitesi, Fen Fakültesi, Matematik Bölümü, Van, Türkiye

ORCID ID: 0000-0002-9015-4155

Müberra SELAH

Van Yüzüncü Yıl Üniversitesi, Fen Fakültesi, Matematik Bölümü, Van, Türkiye

ORCID ID: 0000-0001-6218-398X

ÖZET

Bu çalışmada Banach uzaylarında zayıf topoloji için bazı yeni küme-değerli Krasnosel'kii tipi teoremler kurulmuştur. Elde edilen sonuçları ispatlamadaki ana araç zayıf kompakt olmama ölçüsüdür. Özellikle bu çalışma literatürdeki tek-değerli Krasnosel'kii tipi denklemleri zayıf topoloji için küme-değerli formlarına genişletmektedir.

Anahtar kelimeler: Küme-değerli dönüşüm, Krasnosel'kii tipi teorem, zayıf kompakt olmama ölçüsü.

ABSTRACT

In this study, some new set-valued Krasnosel'skii type theorems are established for weak topology in Banach spaces. The main tool in proving the results obtained is the measure of weak noncompactness. In particular, this study extends the Krasnosel'skii type equations in the literature to set-valued forms for weak topology.

Keywords: Set-valued mapping, Krasnosel'kii type theorem, Measure of weak noncompactness.

GENELLEŞTİRİLMİŞ DARALMA KOŞULUNA SAHİP KÜME-DEĞERLİ DÖNÜŞÜMLER İÇİN BAZI VARLIK SONUÇLARI

SOME EXISTENCE RESULTS FOR SET-VALUED MAPPINGS WITH GENERALIZED CONTRACTION CONDITION

Cesim TEMEL

Prof., Van Yüzüncü Yıl Üniversitesi, Fen Fakültesi, Matematik Bölümü, Van, Türkiye

ORCID ID: 0000-0002-9015-4155

Müberra SELAH

Van Yüzüncü Yıl Üniversitesi, Fen Fakültesi, Matematik Bölümü, Van, Türkiye

ORCID ID: 0000-0001-6218-398X

ÖZET

Bu çalışmada genelleştirilmiş daralma koşuluna sahip iki küme-değerli dönüşümün toplamı için yeni sabit nokta teoremleri ispatladık. Daha sonra elde dilen sonuçları açıklayıcı örnekler sunduk. Son kısımda çalışmamızın bir uygulaması olarak integral kapsamlar için bazı varlık sonuçları elde ettik.

Anahtar kelimeler: Küme-değerli dönüşüm, Sabit nokta teoremi, İntegral kapsam.

ABSTRACT

In this work, we proved new fixed point theorems for the sum of two set-valued mappings with generalized contraction conditions. We then presented examples illustrating the results obtained. In the last part, as an application of our work, we get some existence results for integral inclusion.

Keywords: Set-valued mapping, Fixed point theorem, Integral inclusion.

PREDICTION OF BRAIN TUMOR FROM MAGNETIC RESONANCE IMAGES USING CONVOLUTIONAL NEURAL NETWORK

Rukiye UZUN ARSLAN

Zonguldak Bulent Ecevit University, Faculty of Engineering, Department of Electrical-Electronics Engineering, Zonguldak, Türkiye

ORCID ID: 0000-0002-2082-8695

Ceren KAYA

Zonguldak Bulent Ecevit University, Faculty of Engineering, Department of Biomedical Engineering, Zonguldak, Türkiye

ORCID ID: 0000-0002-1970-2833

İrem ŞENYER YAPICI

Zonguldak Bulent Ecevit University, Faculty of Engineering, Department of Computer Engineering, Zonguldak, Türkiye

ORCID ID: 0000-0003-0655-340X

ABSTRACT

According to the report published by the World Health Organization, cancers originating from brain tumors are among the most common types of cancer worldwide. Therefore, an accurate and rapid diagnosis of brain tumors is of great importance in the selection of an appropriate treatment method and thus increasing the survival rate. In clinical environment, specialized doctors or radiologists commonly utilize magnetic resonance imaging technique due to its many advantages for detection of brain tumors. Deep learning approaches lately gained more popularity have been started to use for diagnosing disease using medical images. In this study, classification of brain tumors as glioma, meningioma, pituitary, and normal from magnetic resonance images has been investigated in relation to the impact of batch sizes on DenseNet121 convolutional neural network, one of the deep learning architectures. In this context, different batch sizes (4, 8, and 16), shear (0.1) and zoom (0.1) ranges have been used. According to the experimental findings, average classification accuracy of DenseNet121 model for four classes, when batch size = 16 (99.50%) has exceeded the results obtained from other batch sizes (batch size = 4 (99.43%) and batch size = 8 (99.43%)).

Keywords: Brain Tumor, Magnetic Resonance Images, Classification, Deep Learning, DenseNet121

OPTIMIZERS COMPARISON OF COVID-19 PREDICTION PERFORMANCES USING CHEST X-RAY IMAGES

Ceren KAYA

Zonguldak Bulent Ecevit University, Faculty of Engineering, Department of Biomedical Engineering, Zonguldak, Türkiye

ORCID ID: 0000-0002-1970-2833

Tuğba PALABAŞ

Zonguldak Bulent Ecevit University, Faculty of Engineering, Department of Biomedical Engineering, Zonguldak, Türkiye

ORCID ID: 0000-0002-6985-6494

ABSTRACT

Coronavirus (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that emerged in Wuhan, China, 2019. Performing automatic computer aided design (CAD) of this disease is clinically vital for early detection, as the virus can easily spread among humans and can even cause permanent damage or death. In this study, the effect of optimizers on performance of three deep transfer learning models to detect COVID-19 is analysed using 1200 covid, 1341 non-covid (normal), and 1345 viral pneumonia chest x-ray images in COVID-19 Radiography Database. Accordingly, classification performances of DenseNet169, InceptionResNetV2, and ResNet50 models are compared using Adaptive moment estimation (Adam) and Stochastic gradient descent (SGD) optimizers at 30 epochs and batch size = 64 parameter values separately. When simulation results obtained from two different optimizers are examined, it has been determined that Adam optimizer has mostly higher classification accuracy than SGD optimizer. In SGD optimizer; average classification accuracy of DenseNet169 model (97.42%) is higher than InceptionResNetV2 (95.36%), and ResNet50 (94.68%) models. However, in Adam optimizer; average classification accuracy of DenseNet169 model (97.25%) is higher than InceptionResNetV2 (96.22%), and ResNet50 (95.88%) models. In this context, it is clearly seen that choice of optimizer has an important effect on the classification performance when using deep learning models.

Keywords: COVID-19 Disease, Chest X-rays, Classification, Deep Learning Models

YEŞİL YAPRAKLI SEBZELERDE MİKROBİYAL İNAKTİVASYONA YÖNELİK VURGULU IŞIK(HIPL) VE MORÖTESİ (UV-C) UYGULAMALARI

PULSED LIGHT (HIPL) AND ULTRAVIOLET (UV-C) APPLICATIONS ON GREEN VEGETABLES FOR MICROBIAL DECONTAMINATION

Zeynep SİNANGİL

Ege Üniversitesi, Fen Bilimleri Enstitüsü, Gıda Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-2847-1424

Taner BAYSAL

Prof. Dr., Ege Üniversitesi, Mühendislik Fakültesi, Gıda Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0003-1039-6275

ÖZET

Son yıllarda, tüketicilerin gıda-sağlık ilişkisi konusundaki farkındalıklarının artması meyve sebze tüketimindeki artışı da beraberinde getirmiştir. Düzenli meyve sebze tüketiminin kanser, kalp hastalıkları, sindirim sistemi hastalıkları başta olmak üzere birçok kronik hastalık riskini azalttığı ve bağışıklık sistemini güçlendirdiği birçok çalışma ile kanıtlanmıştır. Dünya Sağlık Örgütü (WHO) günlük meyve sebze tüketimini 400g olarak tavsiye etmektedir. Sebzeler vitamin, mineral ve lif açısından zengin olması sebebiyle insan sağlığı açısından önem teşkil eden bir gruptur. Yüksek klorofil içeriği sayesinde yeşil yapraklı olarak isimlendirilen bu sebzeler sık tüketim grubunda yer almaktadır. Tüketimlerinin artmasıyla beraber gıda güvenliğini ve kalitesini koruyabilmek için yapılan çalışmalarda artmıştır. Hasat sonrası ve depolama süreçlerinde taze sebzelerde sıklıkla mikrobiyel kaynaklı bozulmalar olmaktadır. Amerika Birleşik Devletleri Gıda ve İlaç Dairesi (FDA) ve Amerika Birleşik Devletleri Hastalık Kontrol ve Korunma Merkezleri (CDC) raporları göz önünde bulundurulduğunda özellikle toprak kökenli bakterilerin (*Listeria monocytogenes*, *E. coli* O157:H7, *Salmonella* spp.) yeşil yapraklı sebzelerde insan sağlığına risk oluşturduğu görülmektedir. Gıda ve Yem için Hızlı Alarm Sistemi (RASFF) tarafından sunulan çeşitli ülkelerden elde edilen verilerde *Salmonella*, L*isteria* ve *Bacillus cereus* ve *E.coli* 'nin yeşil sebzelerde üst limitlerin üzerinde kaydedildiği gözlemlenmiştir. Son yıllarda, meyve ve sebzelerin mikrobiyal kaynaklı bozulmaların geciktirilerek raf ömrünün uzatılması ve kalite özelliklerinin korunması amacıyla kullanılan ısıl olmayan işlemler oldukça ilgi çekmektedir. Geleneksel yöntemlerde kullanılan perasetik asit, klor ve klordioksit içeren yıkama uygulamaları sonrasında ürünlerde kalıntı sorunu ortaya çıkmaktadır. Yıkama uygulamalarına alternatif Vurgulu Işık (PL), Ultrases (US), Vurgulu elektrik alan (PEF) ve Ultraviyole ışık (UV-C) gibi yeni teknolojilerin meyve ve sebze alanında kullanım potansiyelinin ortaya çıkarılmasına yönelik araştırmalar artmıştır. Isıl olmayan yenilikçi ışık teknolojilerinden HIPL ve UV-C uygulamaları meyve ve sebzelerde yüzey dekontaminasyonu amacıyla uygulanmakta, bu işleme yöntemleri sayesinde meyve ve sebzeler minimal işlenerek kalite özelliklerini daha iyi koruyabilmektedir. Yenilikçi ışık teknolojilerinden olan HIPL'nin çevreye zararlı etkilerinin bulunmaması, ürünün besin değeri ve kalite özelliklerini koruması gibi avantajları bulunmaktadır. Ultraviyole-C ışık (UV-C) teknolojisi; hızlı ve etkili dekontaminasyon sağlayabilmesi nedeniyle gıda sektöründe gıda ambalajlarının ve suların dezenfeksiyonunda, meyve ve sebzelerin yüzey dekontaminasyonunda kullanılmaktadır. Hazırlanan bu derleme çalışmasında geleneksel yıkama işlemlerine alternatif olarak ortaya çıkan yenilikçi ışık teknolojilerinin yeşil yapraklı sebzelerde mikrobiyal inaktivasyon amacıyla kullanımı incelenmiş ve konu ile ilgili güncel çalışmalar bir araya getirilmiştir.

Anahtar kelimeler: HIPL, UV, yeşil sebze, ısıl olmayan teknolojiler, gıda güvenliği, patojen mikroorganizma, gıda mikrobiyolojisi

ABSTRACT

Recently consumer's awareness for food-health relationship has been increased. Regarding to that, consumption of fruits&vegetables have also been increased. Clinical studies have recorded sufficient consumption of fruits and vegetables decreases the risk of chronical diseases such like; cancer, cardiovasculer and digestion diseases. Clinical studies have also recorded that they boost the immune system. World Health Organisation (WHO) suggests 400g of fruits&vegetables consumption per day. Vegetables are rich in vitamins, minerals and fibers. Thus allows them to be an important group on a nutritious diet and human health. Green vegatables are found in frequent consumption group by their high vitamin&mineral content. Since they are rich in chlorophil they are named as green vegatables. Regarding to their benefits and increased consumption, researchs are increased to ensure food safety and quality. After the harvest and during the storage of fresh vegetables, microorganism sourced food spoilages are usally observed. Center of Disease Control (CDC) and Food and Drug Administration (FDA) reports that soil origned *Listeria monocytogenes, E. coli O157:H7, Salmonella spp* are the main food spoilage microorganisms and poses a danger towards human health. The data collected from several countries and provided by Rapid Alert System for Food and Feed (RASFF) shows that *Salmonella, Listeria, E.coli* and *B.cereus* are commonly found above limits in green vegetables. In these recent years utilization of non thermal food processing technologies have been increased to delay the spoilage of fruits and vegetables, extend shelf life and improve quality properties. Researchs are increased on novel technologies to enhance their utilization in fruits&vegetables area such like; Pulsed Electrical Field (PEF), Ultraviolet light (UV-C), Ultrasound (US) and Pulsed Light (HIPL) which are alternative to traditional washing (peracetic acid, chlor, chlordioxide) applications. HIPL and UV-C are used for surface decontamination on fruits&vegetables, by these applications fruits&vegetables are minimally processed and food quality is preserved. HIPL technology provides a homogen decontamination, it is environmental friendly and has minimum impact on the nutrious and quality properties of the product. UV-C technology is widely used in the food industry by providing an efficient and fast decontamination on food surfaces, water disinfection. Therefore this review highlights recently published research results of UV-C and HIPL Technologies applied on green vegetables to obtain microbial inactivation alternative to washing methods.

Keywords: HIPL, UV-C, novel technologies, food safety, food quality, food microbiology, green vegetables

aPARÇACIK GÖRÜNTÜLEMELİ HIZ ÖLÇÜMÜ YÖNTEMİ İLE DUVAR TİPİ GAZ YAKITLI ISITMA CİHAZINA AİT BRÜLÖR HAVA-YAKIT GİRİŞİNİN DENEYSEL OLARAK İNCELENMESİ

EXPERIMENTAL INVESTIGATION OF BURNER AIR-FUEL INLET OF A WALL-HANG GAS-FIRED HEATING APPLIANCE USING PARTICLE IMAGING VELOCIMETRY

Utku Alp YÜCEKAYA

Araş. Gör., Dokuz Eylül Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği Bölümü, İzmir, Türkiye

ORCID ID: 0000-0003-0934-5593

Dilek KUMLUTAŞ

Prof. Dr., Dokuz Eylül Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği Bölümü, İzmir, Türkiye

ORCID ID: 0000-0002-0778-785X

Özgün ÖZER

Dr., Manchester Üniversitesi, Makina Uzay-Havacılık ve İnşaat Mühendisliği Bölümü, Manchester, Birleşik Krallık

ORCID ID: 0000-0003-4130-2323

Hasan AVCI

Yük. Mak. Müh., Dokuz Eylül Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-3297-1229

ÖZET

Duvar tipi gaz yakıtlı ısıtma cihazları günümüzde yakıtın ulaştığı bölgelerde ortam ısıtması ve sıcak su ihtiyacı için yaygın olarak kullanılmaktadır. Cihazın çalışması sırasında fan yardımı ile emilen yakıt ve hava karıştırılarak brülör içerisine iletilmektedir. Brülör içerisine ulaşan hava-yakıt karışımının çıkış deliklerine homojen bir şekilde iletilmesi yanma karakteristiğini etkilemektedir. Bu durum yanma bölgesinde homojen bir ısı transferi oluşmasına ve emisyon karakteristiğine direk olarak etki etmektedir. Bu etkiler cihazın ısıtma performansında ve emisyon oranlarında değişikliğe sebep olduğu için çevresel etkiler bazında ve tasarım kriterleri için önem arz etmektedir.

Çalışma kapsamında, Stereo Parçacık Görüntülemeli Hız Ölçümü (SPGHÖ) yöntemi kullanılarak santrifüj bir fan yardımı ile iletilen soğuk akışın brülör giriş bölgesi hız dağılımı incelenmiştir. Brülör giriş bölgesi 5 farklı düzlemden incelenmiş ve 2 boyutlu 3 bileşenli hız verileri elde edilmiştir. Deneyler cihazın maksimum kapasitede dolayısıyla maksimum fan dönüş hızında gerçekleştirilmiştir. Yapılan çalışma sonucunda; elde edilen SPGHÖ verileri interpolasyon ile 3 boyutlu hale getirilerek brülör giriş bölgesinin akış karakteristiği deneysel olarak sunulmuştur.

Anahtar kelimeler: Parçacık Görüntülemeli Hız Ölçümü (PGHÖ), Duvar Tipi Isıtma Cihazı, Akış Görüntüleme

ABSTRACT

Wall-hang gas-fired heating appliances are now widely used for both space heating and hot water needs in regions where fuel is available. During the operation of the device, the fuel and air sucked in with the help of the fan are mixed and transmitted into the burner. The combustion characteristics are influenced

by the uniform distribution of the air-fuel mixture from the burner to the outlet holes. This situation directly affects the formation of a homogeneous heat transfer in the combustion zone and emission characteristics. Since these effects cause changes in the heating performance and emission rates of the device, they are essential for both environmental impacts and design criteria.

Within the scope of the study, the burner inlet zone velocity distribution of the cold flow transmitted by a centrifugal fan using the Stereo Particle Image Velocimetry (SPIV) method was investigated. The burner inlet zone was examined from 5 different planes and 2-dimensional 3-component velocity data were obtained. The experiments were carried out at the maximum capacity of the device and, therefore at the maximum fan rpm. As a result of the study, the flow characteristics of the burner inlet zone are presented experimentally by converting the obtained SPGHÖ data into 3D by interpolation.

Keywords: Particle Image Velocimetry (PIV), Wall Hang Heating Appliance, Flow Visualization

DİKDÖRTGEN KESİTLİ KANALLARDA YATAK MALZEMESİ DEĞİŞİMİNİN AKIŞ HIZINA ETKİSİ

EFFECT OF BED MATERIAL CHANGE ON FLOW RATE IN RECTANGULAR CHANNELS

Berna AKSOY

Dr. Öğr. Üyesi, Zonguldak Bülent Ecevit Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, Zonguldak, Türkiye

ORCID ID: 0000-0001-6925-1594

Dilek Cansu BOZACIOĞLU

Arş Gör., Zonguldak Bülent Ecevit Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, Zonguldak, Türkiye

ORCID ID: 0000-0001-7579-6494

ÖZET

Ülkemizde son yıllarda meydana gelen taşkın olayları büyük ölçüde mal ve can kaybına neden olmuştur. Taşkınların birçok oluşma nedeni bulunmaktadır. Bu nedenler arasında; bölgenin topografyası, jeolojik yapısı, yağış miktarının fazla olması, bölgenin iklim şartları, akarsu yataklarının doğasının bozulması, taşkın riski bulunan bölgelerde kontrolsüz kentleşme ve kontrolsüz yapısal faaliyetler, tabii ve beşeri kaynaklı faktörler yer almaktadır. Yağış parametresi taşkın oluşumunu etkileyen önemli bir faktör olmasına rağmen akarsu yataklarının ve havza özelliklerinin tahribatı gibi olaylar da yaşanabilecek taşkınların büyüklüğünü etkilemektedir. Taşkın olasılığını hesaplamak için akışa ait özelliklerin belirlenmesi gerekmektedir. Açık kanallarda akış özelliklerini belirlemek için yapılan hidrolik hesaplamalar, ana kanalın pürüzlülüğünü etkileyen tüm özelliklerin değerlendirilmesini gerektirir. Buna bağlı olarak bu çalışmada, teorik olarak belirlenmiş dikdörtgen kesitli bir kanal içerisindeki yatak malzemesinin özelliklerini değiştirerek (örn. dane boyutu dağılımı) akış hızı hesaplanmıştır. Akış hızı hesaplarında hızı etkileyen diğer tüm parametreler (örn. kanal kesit geometrisi, kanal eğimi, akış yüksekliği vb.) sabit tutulup yalnızca yatak malzemesine ait özellikler değiştirilmiştir. Yatak malzemelerine ait özellikler Zonguldak Bülent Ecevit Üniversitesi İnşaat Mühendisliği Araştırma Laboratuvarları bünyesinde bulunan Zemin Mekaniği Laboratuvarı'nda gerçekleştirilen elek analizi deneyleri ile belirlenmiştir. Akış hızları hesaplandıktan sonra kanal içindeki debi hesaplanarak taşkın oluşum durumu incelenmiştir. Buradan elde edilen sonuçlar ile bir akarsuyun membadan mansapa değişen yatak mazlemesi ile taşkın oluşumu arasındaki ilişki ortaya koyulmaya çalışılmıştır.

Anahtar kelimeler: Yatak malzemesi, akış hızı, debi, taşkın.

ABSTRACT

The flood events that have occurred in our country in recent years have caused a great deal of loss of life and property. There are many causes of floods. Among these reasons; The topography of the region, its geological structure, the high amount of precipitation, the climatic conditions of the region, the deterioration of the nature of the river beds, uncontrolled urbanization and uncontrolled structural activities in areas with flood risk, natural and human origin factors. While the precipitation parameter is an important factor affecting the flood, events such as faulty land use, destruction of stream beds and basin features also affect the magnitude of floods. In order to calculate the flood probability, it is necessary to determine the characteristics of the flow. Hydraulic calculations to determine flow characteristics in open channels require the evaluation of all properties that affect the roughness of the main channel. Accordingly, in this study, the flow rate was calculated by changing the properties of the bed material (eg, grain size distribution) in a theoretically determined rectangular channel. All other

parameters affecting the velocity (eg channel section geometry, channel slope, flow height, etc.) were kept constant in flow velocity calculations and only the properties of the bed material were changed. The properties of the bedding materials were determined by the sieve analysis experiments carried out in the Soil Mechanics Laboratory of Zonguldak Bülent Ecevit University Civil Engineering Research Laboratories. After calculating the flow rates, the flow rate in the channel was calculated and the flood formation situation was examined. With the results obtained here, the relationship between the changing bed material of a stream from upstream to downstream and flood formation was tried to be revealed.

Keywords: Bed material, flow velocity, flow rate, flood.

DÜŞÜK PLASTİSİTELİ İNCE DANELİ ZEMİNLERİN OTURMA DAVRANIŞLARININ İNCELENMESİ – ZONGULDAK ÖRNEĞİ

INVESTIGATION OF SETTLEMENT BEHAVIORS OF LOW PLASTICITY FINE GRAINED SOILS – ZONGULDAK EXAMPLE

Dilek Cansu BOZACIOĞLU

Arş. Gör., Zonguldak Bülent Ecevit Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, Zonguldak, Türkiye

ORCID ID: 0000-0001- 7579-6494

Emrah DAĞLI

Arş. Gör. Dr., Zonguldak Bülent Ecevit Üniversitesi, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, Zonguldak, Türkiye

ORCID ID: 0000-0002-5744-8151

ÖZET

Bir yapının inşasından önce, yapı temelinin stabilitesini kontrol ederken yapı temelinden zemine aktarılan taban basıncının zeminin taşıma gücü değerini aşmamasına ve yapıya büyük ölçüde zarar verecek boyutta oturmaya neden olmamasına dikkat edilir. Bu nedenle yapı temellerinin taşıma gücü hesapları yapılırken izin verilebilir oturma değerleri ile sınırlandırılmaları gerekmektedir. Yapılan araştırmalar, temel zemininde oluşan oturmaların üç ayrı grupta toplandığını belirtmektedir. Bunlar; ani oturma, birincil konsolidasyon oturması ve ikincil konsolidasyon oturmasıdır. Kaba daneli zeminlerde genellikle ani oturmalar meydana gelirken, ince daneli zeminlerde çoğunlukla konsolidasyon oturmaları meydana gelmektedir. Konsolidasyon oturması; suya doygun ince daneli zeminlerin boşluklarındaki suyun yavaşça dışarı çıkmasıyla gerçekleştiği için bu oturma zamana bağlı olarak gerçekleşmektedir. Konsolidasyon oturmasının miktarının ve süresinin hesaplanabilmesi için gerekli olan parametreler araziden alınan örselenmemiş numuneler üzerinde gerçekleştirilen 1 boyutlu ödometre deneyi ile elde edilir. Bununla beraber bu parametreler zemin indeks özelliklerini belirlemek için yapılan tanımlama deneyleri ile de elde edilebilir. Bu çalışmada; düşük plastisiteli killi zeminlerin laboratuvarda 1 boyutlu ödometre deneyi yapılmadan indeks özellikler ile konsolidasyon parametreleri belirlenmiştir. Her bir zemin grubu dikdörtgen kesitli aynı yapı temeli altında meydana gelen oturma miktarları ve oturma zaman ilişkileri incelenmiştir. Konsolidasyon analizleri yapılırken yapının inşaat süresi 1 yıl olarak tanımlanmıştır. Bu zeminlerin indeks özellikleri, farklı zemin etüt firmalarınca yapılan Zonguldak ili Merkez ve Çaycuma ilçelerinde bulunan farklı bölgelere ait zemin etüt raporlarından temin edilmiştir. Oturma analizlerinin sonucunda, en düşük oturma değeri 59,12 cm ve en yüksek oturma değeri 125,46 cm olarak elde edilmiştir. Ayrıca yapı inşası tamamlandıktan sonra %99 konsolidasyonun tamamlanması için geçen en az süre 2 yıl 9 ay iken en fazla süre ise 53 yıl olarak tespit edilmiştir.

Anahtar kelimeler: İnce Daneli Zemin, Oturma, Konsolidasyon, Oturma Süresi

ABSTRACT

Before the construction of a building, while controlling the stability of the foundation of the building, care should be taken into account that the base pressure transferred from the foundation of the building to the soil should not exceed the bearing capacity of the soil and should not cause settlement that would damage the structure. For this reason, when calculating the bearing capacity of the building foundations, they should be limited to the allowable settlement values. Studies show that the settlements occured on the foundation soil are collected in three different groups. These are the immediate settlement, the primary consolidation settlement and the secondary consolidation settlement. While immediate settlements usually occur in coarse-grained soils, consolidation settlements mostly occur in fine-grained

soils. Consolidation settlement takes place depending on time, as the water in the water-saturated fine-grained soils slowly comes out of the voids. The parameters required to calculate the amount and duration of consolidation settlement are obtained by a 1-dimensional oedometer test performed on undisturbed samples taken from the field. However, these parameters can also be obtained by identification experiments to determine soil index properties. In this study; index properties and consolidation parameters of low plasticity clayey soils were determined without performing a 1-dimensional oedometer test in the laboratory. The amount of settlement and settlement time relations under the same rectangular cross-sectional building foundation for each soil group were examined. During the consolidation analysis, the construction period of the building was defined as 1 year. The index properties of these soils were obtained from the soil survey reports of different regions in the Central and Çaycuma districts of Zonguldak province, which were made by different soil survey companies. As a result of the settlement analysis, the lowest settlement value was 59.12 cm and the highest settlement value was 125.46 cm. In addition, the minimum time requirement for the completion of the 99% consolidation after the construction was determined as 2 years and 9 months while the maximum time requirement was 53 years.

Keywords: Fine Grained Soil, Settlement, Consolidation, Settlement Time

INVESTIGATION OF STIFFNESS ON THE RESPONSE OF HIGH MODULUS COLUMNS UNDER LATERAL LOADING CONDITIONS

Abduhadi Nafea MHMOOD

Yildiz Technical University, Civil Engineering, Istanbul, Türkiye

ORCID ID: 0000-0002-4146-4501

Pelin TOHUMCU ÖZENER

Yildiz Technical University, Civil Engineering, Istanbul, Türkiye

ORCID ID: 0000-0002-9407-286X

ABSTRACT

Different modulus columns are often used to provide support and stability for a variety of structures, including buildings, bridges, and other types of infrastructure. These columns are well known for their high level of stiffness and strength, which makes them a good option for resisting lateral loads. In this research study, the finite element program (PLAXIS^{3D}) was used to determine the influence of the stiffness ratio (r), between the soil and the columns, on the response of different types of columns. Embedded beam elements were used to simulate the columns. The constitutive model for the columns is linear elastic. A hardening soil model was used to simulate the behavior of the sand. First of all, the model was validated based on a study from the literature Wang et al. (2022). A very good match was founded between the outcomes of the program and the results of the study. After that, the lateral deflection, the shear forces, and the bending moment of different columns (i.e. steel piles, concrete columns, and low-modulus of columns) were calculated based on 36 different analyses. The results showed that the lateral deflection was decreased as the stiffness ratio increased. Furthermore, it was found that increasing the diameter of the column had a positive influence on the behavior of the column, the deflection was decreased while the shear and the bending moment was increased.

Keywords: Stiffness ratio, High modulus columns, Lateral loading, Column stiffness, Column response.

ALGORITHM FOR SOLVING THE MOTION'S TYPE OF THE BOLTED BEAM

CHEKIROU Fatine

Université des Sciences et de la technologie Houari Boumediene, Faculty of Mechanical Engineering and Process Engineering, Mechanical And Production Construction Departement, Algiers, Algeria

BRAHIMI Khaled

Université des Sciences et de la technologie Houari Boumediene, Faculty of Mechanical Engineering and Process Engineering, Mechanical And Production Construction Departement, Algiers, Algeria

ABSTRACT

This work describes the algorithm for solving the motion's type of the bolted beam problem. This structure consists of two beams connected by bolts which allow the appearance of a frictional force at the contact interface. This frictional force leads to a non-linear kinematics of the stick-slip type. Consequently, three regimes of motion will appear: the pure slip regime for zero clamping force, the pure stick regime for maximum clamping force and the combined regime for intermediate clamping forces. In the last regime, the motion is of the stick-slip type for the first cycles and of the stick type for the last cycles. The amplitudes of motion deciding the transition between each phase are: the extremum amplitude estimated at each half cycle of vibration, the critical amplitude which corresponds to the transition from the stick-slip motion to the pure stick motion and the amplitude of transition of the motion from the sticking sub-phase to the slip sub-phase in the first cycles of the combined regime.

Keywords: *Non-linear vibrations,stick slip phenomenon, structural damping,bolted beam.*

ARABİNOZ KUMARİN VE SHİFF BAZI TÜREVLERİNİN SENTEZLERİ VE KARAKTERİZASYONLARI

SYNTHESIS AND CAHARACTERIZATION OF ARABINOSE COUMARIN AND THEIR SCHIFF BASE DERIVATIVES

Fatma ÇETİN TELLİ

Doç.Dr., Ege Üniversitesi Fen Fakültesi Kimya Bölümü, 35100 Bornova/İzmir, TÜRKİYE

Assoc.Prof.Dr., Ege University, Faculty of Science, Department of Chemistry, 35100, Bornova, İzmir, Türkiye

ORCID ID: 0000-0003-2302-6409

Ebru SARIOĞLU

YL, Ege Üniversitesi Fen Fakültesi Kimya Bölümü, 35100 Bornova/İzmir, Türkiye

Ege University, Faculty of Science, Department of Chemistry, 35100, Bornova, İzmir, Türkiye

ORCID ID: 0000-0002-0373-8831

Yeşim SALMAN

Prof.Dr., Ege Üniversitesi Fen Fakültesi Kimya Bölümü, 35100 Bornova, İzmir, Türkiye

Prof.Dr., Ege University, Faculty of Science, Department of Chemistry, 35100, Bornova, İzmir, Türkiye

ORCID ID: 0000-0003-2731-6497

ÖZET

Kumarin türevleri, güçlü farmakolojik aktiviteye, düşük toksisiteye ve yan etkilere, daha az ilaç direncine, yüksek biyoyararlanıma, geniş spektruma, daha iyi iyileştirici ve benzeri etkilere sahip olduğundan ilaç tasarımı için tıbbi aday olarak aktif olarak araştırılmıştır [1]. Kumarinler ve Schiff bazları, antiviral, antimikrobiyal, antidiyabetik, antikanser, antioksidan, antikoagülan, enzim aktivitesi ve antiinflamatuar gibi birçok biyolojik aktiviteye sahiptir [2-3]. Ayrıca Schiff bazı komplekslerinin antifungal, antibakteriyel, antioksidan, antiproliferatif ve antiviral özelliklere sahip olduğu gösterilmiştir [4]. Fareler üzerinde yapılan *in vivo* çalışmalar, Schiff bazlarının ve metal komplekslerinin antikanser aktivitelerinin oldukça yüksek olduğunu göstermiştir [5]. Bu çalışmanın temel amacı biyolojik uygulamalarda, özellikle antikanser aktivite çalışmalarında etkili olduğu bilinen kumarinin arabinoz türevlerini incelemektir. Bu çalışmada, tetra asetil arabinozdan kumarin arabinoz ve Schiff bazı türevleri sentezlendi. Sentezlenen arabinoz kumarin ve bunların Schiff bazı türevlerinin yapısı ve saflığı, ^{1}H ve ^{13}C NMR, IR, UV, elementel analiz, erime noktası ve optik dönüş açısı analiz yöntemleri ile doğrulandı. Ayrıca sentezlenen arabinoz kumarin ve bunların Schiff bazı türevlerinin antikanser aktiviteleri yaygın olarak kullanılan meme kanseri MCF-7 hücre hattı kullanılarak incelenecektir.

Anahtar kelimeler: Arabinoz, Kumarin, Schiff Bazı, Antikanser Aktivite, Meme Kanseri.

TEŞEKKÜR

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ABSTRACT

Coumarin derivatives have strong pharmacological activity, low toxicity and side effects, less drug resistance, high bioavailability, wide spectrum, better curative and the like many coumarin compounds with effects are being actively studied as medical candidates for drugs [1]. Coumarins and their schiff bases have many biological activities, such as antiviral, antimicrobial, antidiabetic, anticancer, antioxidant, anticoagulant, enzyme activity and anti-inflammatory [2-3]. Moreover, Schiff-base complexes have been shown to have antifungal, antibacterial, antioxidant, antiproliferative, and antiviral properties [4]. *In vivo* studies on mice have shown that the anticancer activities of Schiff bases and their metal complex are quite high [5]. The main purpose of this study is to arabinose coumarin derivatives, which are known to be effective in biological applications, especially in anticancer activity studies. In this study, arabinose coumarin and their Schiff base derivatives are synthesized from tetra acetyl arabinose. The structure and purity of arabinose coumarin and their Schiff base derivatives synthesized were verified by ^{1}H and ^{13}C NMR, IR, UV, elemental analysis, melting point and optical rotation angle analysis methods. In addition, the anticancer activities of synthesized arabinose coumarin and their Schiff base derivatives will be examined using the widely used breast cancer cell line MCF-7 cell proliferation method.

Keywords: Arabinose, Coumarin, Schiff Base, Anticancer Activity, Breast Cancer.

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DUVAR TİPİ YOĞUŞMALI ISITMA CİHAZLARINDA İÇTEN KANALLI KANATLI BORU TİPİ ISI DEĞİŞTİRİCİSİ ISIL PERFORMANSININ SAYISAL OLARAK İNCELENMESİ

NUMERICAL INVESTIGATION OF THERMAL PERFORMANCE OF THE INTERNAL CHANNELS TYPE OF THE FINNED TUBE HEAT EXCHANGER IN CONDENSING WALL HANG HEATING APPLIANCE

Hasan AVCI

Yük. Mak. Müh., Dokuz Eylül Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-3297-1229

Dilek KUMLUTAŞ

Prof. Dr., Dokuz Eylül Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-0778-785X

Özgün ÖZER

Dr., Manchester Üniversitesi, Makina Uzay-Havacılık ve İnşaat Mühendisliği Bölümü, Manchester, Birleşik Krallık

ORCID ID: 0000-0003-4130-2323

Utku Alp YÜCEKAYA

Araş. Gör., Dokuz Eylül Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0003-0934-5593

ÖZET

ERP (Energy Related Products) yönetmeliği ile Türkiye'de sezonsal verimliliği %91'in altında kalan duvar tipi ısıtma cihazların satışı yasaklanmıştır. Paslanmaz çelik serpantin borulu tip ısı değiştiricileri genellikle geleneksel yoğuşmalı duvar tipi ısıtma cihazları için kullanılır. Yoğuşmalı duvar tipi ısıtma cihazına olan talebin artması nedeniyle ERP yönetmeliğinin sezonsal verimliliğini karşılayan ve uygun maliyetli ürünler için yeni tip ısı değiştiricisi tasarımlarının geliştirilmesi gereklidir.

Bu çalışmada, yoğuşmalı duvar tipi ısıtma cihazlarında kullanılabilecek içten kanallı kanatlı boru tipi ısı değiştirici modellenmiştir. Çeşitli kanal sayılarına sahip kanatlı borulu içten kanallı tip ısı değiştirici tasarımlarının ısıl performansı üzerindeki etkileri sayısal yöntem kullanılarak incelenmiştir. İç kanal sayısının suya aktarılan toplam ısı miktarı (W) ve ısı değiştiricisi hacmi başına düşen toplam ısı miktarı (W/dm^3) üzerindeki etkileri belirlenmiştir. İnceleme sonucunda sekiz kanallı modelin prototipi yapılmış olup deneysel çalışmalar ile sonuçlar tek kanallı modelle karşılaştırılmıştır. Sonuç olarak, aynı yanma ünitesi hacmi içerisine tasarlanan sekiz kanallı ısı değiştiricisi ile sezonsal verimlilik %92,4 ve %63 daha fazla çıkış gücü elde edilmiştir.

Anahtar kelimeler: Isı Değiştiricisi, Duvar Tipi Isıtma Cihazı, Hesaplamalı Akışkanlar Dinamiği (HAD)

ABSTRACT

The sale of wall-hang heating appliances with seasonal efficiency below 91% has been forbidden in Turkey according to the ERP (Energy Related Products) regulations. The stainless steel coil tube type heat exchangers are generally used for the conventional condensing wall hang heating appliance. New designs for heat exchangers needed to be developed for seasonal efficiency of ERP regulations and cost-efficient products due to the demand growth for the condensing wall hang heating appliance.

In this study, the finned tube with internal channels type heat exchangers, which could be used for condensing wall hang heating appliances are modelled. The effects of the finned tube internally channels type heat exchanger's designs with various channel numbers on the thermal performance are investigated using the numerical method. The effects of internal channel number are determined by the total amount of heat transferred to the water (W) and the total amount of heat per the heat exchanger's volume (W/dm3). The eight channels model was prototyped and compared real results with the base single-channel model. As a result, 63% more output power and 92,4% seasonal efficiency were gained with the same heat engine volume used with numerical simulations.

Keywords: Heat Exchanger, Wall Hang Heating Appliance, Computational Fluid Dynamics (CFD)

KAYNAK ROBOTLARINDA EKSENEL TEKRARLANABİLİRLİK TESTLERİ VE GEÇERLİ KILMA ÇALIŞMALARI

WELDING ROBOT AXIAL REPEATABILITY TESTS AND VALIDATION STUDIES

Halil Tolga AYVALI

Erciyes University, Faculty of Engineering, Department of Mechanical Engineering, Kayseri, Türkiye

ORCID ID: 0000-0001-6466-1156

Hamdi TAPLAK

Assoc. Prof., Erciyes University, Faculty of Engineering, Department of Mechanical Engineering, Kayseri, Türkiye

ORCID ID: 0000-0003-3387-2692

ÖZET

Bu tez çalışması, kaynak robotunun tekrarlanabilirlik test edilmesine odaklanıyor. Kaynak robotu, üretim sürecinde kullanılan bir cihazdır ve tekrarlanabilirliği etkileyen birçok parametreye sahiptir. Deney tasarımı, robotun hareket kabiliyeti dahilinde ele alınacak bir noktadan başlayarak, X, Y ve Z eksenleri için 3 farklı komparatör monte edilir. İstatistiksel olarak belirlenen tekrar sayısı kadar sıfır noktasına makinanın hareket ettirilerek her hareketin sonunda komparatörlerdeki değerler okunup kaydedilir. Bu deney ile robotun tekrarlanabilirlik değeri ölçülür.

Kritik parametreler test edilebilmesi için numune sayısı tercihleri belirtilmiştir. Yeterliliği görebilmek için pek çok farklı yöntem olabilir ancak tezde kullanılan istatiksel analiz yöntemi Cpk analizidir.

Bakım süreçleri, robot kaynak makinesinde elektriksel mekaniksel bakımlarını gerçekleştirir. Bakım bölümü, İmalat Mühendisliği ile belirlenmiş olan kritik parametrelerle ilgili kontrollerini her arızi bakımdan veya planlı bakımdan sonra gerçekleştirerek, bu parametrelere karşılık makinanın veya ekipmanın validasyon raporunda değişiklik olup olmadığını kayıt altına alır. Bu gibi bakım süreçleri, kaynak robotunun tekrarlanabilirliği etkileyen faktörler arasındadır.

Bu çalışma, kaynak robotu gibi önemli bir cihazın üretim sürecinde ekonomik ömrünü maksimum seviyede tutabilmek ve bu seviyeyi ölçebilmek adına doğrulama ve geçerli kılma faaliyetleri ele alınmıştır. Regülasyonel gerekliliklerle birlikte standartlara uyum sağlamak amacıyla işletmelerin kalite kontrol süreçlerinin geliştirilmesi için önemli bir adımdır. Sonuç olarak, bu tez çalışması, kaynak üretim sürecindeki kritik parametrelerden biri olan robotunun tekrarlanabilirliğinin test edilmesi için kapsamlı bir çalışma sunmaktadır.

Anahtar kelimeler: Kaynak Robotu, Tekrarlanabilirlik, Kritik Parametreler, Yeterlilik, Cpk Analizi, Bakım Süreçleri, Geçerli Kılma, Doğrulama, Yasal Gereklilikler, Üretim Süreci

ABSTRACT

This thesis work focuses on testing the repeatability of a welding robot, a device utilized in the manufacturing process with numerous parameters affecting its repeatability. The experiment design commences from a point within the robot's mobility while mounting 3 different comparators for the X, Y, and Z axes. The machine is moved to the zero point for a statistically determined number of repetitions, and values on the comparators are read and recorded at the end of each movement. This experiment enables measurement of the robot's repeatability value.

Critical parameters are tested based on sample number preferences. While there are various methods to assess adequacy, the thesis employs Cpk analysis in statistical analysis.

Maintenance processes perform electrical and mechanical maintenance on the robot welding machine. The maintenance department checks critical parameters determined by Manufacturing Engineering after each breakdown or planned maintenance and records whether there is a change in the validation report of the machine or equipment against these parameters. These maintenance processes are among the factors that affect the repeatability of the welding robot.

This study discusses verification and validation activities to maximize and measure the economic life of a welding robot in the production process, which is essential to improving the quality control processes of enterprises and comply with regulatory requirements and standards. In conclusion, this thesis presents a comprehensive study for testing the repeatability of the robot, one of the critical parameters in the welding production process

Keywords: Welding Robot, Repeatability, Critical Parameters, Qualification, Cpk Analysis, Maintenance Processes, Validation, Verification, Regulatory Requirements, Production Process

STUDY OF THE MECHANICAL PROPERTIES AND THE BOND STRENGTH OF SISAL FIBER-REINFORCED SELF-COMPACTING REPAIR MORTAR BASED IN DUNE-LIMESTONE SAND

Krobba BENHARZALLAH

Univerity Amar Telidji of Laghouat, Faculty of Civil engineering and Architecure, Structure Rehabilitation and materials Laboratory, Laghouat, Algeria

ORCID ID: 0000-0002-7519-7210

Djamed ANFAL

Univerity Amar Telidji of Laghouat, Faculty of Civil engineering and Architecure, Departemen of Civil engineering, Laghouat Algeria

ORCID ID: 0009-0003-3927-3110

ABSTRACT

Reinforced concrete is the most widely used material in the world, but it is designed with a specific lifespan and deteriorates over time due to exposure to environmental conditions. In order to increase the life of concrete structures, they can sometimes be rehabilitated and repaired using repair materials. However, problems can develop between the repair material and the old concrete due to the differential deformation between them. The compatibility of repair products with ancient concrete must be established due to the availability of a wide range of repair materials in the construction sector with a large range of physical and mechanical qualities. Good adhesion between the repair materials and the substrate is a key factor in the performance of the concrete repair. The main objective of this article is to study the effect of sisal fiber length on the mechanical behavior of self-compacting repair mortars based on dune sand and calcareous sand and to evaluate the bond strength between the repair mortar and the concrete substrate. An investigation was carried out through the splitting tensile test. In this study, the repair mortar mixtures consisted of cement, sand, water, superplasticizer, and sisal fibers of different lengths (5, 10, and 20 mm). The obtained results show that, compared to the mortar without fiber, an enhancement of the flexural strength of mortars is obtained when sisal fibers are added. Excellent bond strength was also observed for MR5 (with a sisal fiber length of 5 mm).

Keywords: repair mortar, calcareous sand, dune sand, sisal fiber, mechanical properties, bond strength.

SAVUNMA SANAYİ PROJESİ ÜRETİMİNDE PROJE DEĞERLENDİRME VE GÖZDEN GEÇİRME TEKNİĞİ (PERT) UYGULAMASI

PROJECT EVALUATION AND REVIEW TECHNIQUE (PERT) APPLICATION IN DEFENSE INDUSTRY PROJECT PRODUCTION

Cevriye TEMEL GENCER

Prof Dr, Gazi Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Ankara, Türkiye

ORCID ID: 0000-0000-0000-0000

Mahide Begüm ÇİÇEK ASLAN

Gazi Üniversitesi, Fen Bilimleri Enstitüsü, Endüstri Mühendisliği, Ankara, Türkiye

ORCID ID: 0000-0003-4647-3244

ÖZET

Savunma sanayi projeleri, ülkelerin savunması ile ilgili olduğu için oldukça yüksek önem arz etmektedir. Bu projelerin hedeflerine ve hedeflenen noktalara ulaşabilmesi için projelerin etkin bir şekilde planlanması, yönetilmesi ve izlenmesi gerekmektedir. Savunma sanayi sektöründe proje yönetiminin önceliği, müşteri beklenti ve hedeflerini karşılayan gelişmiş askeri sistem ve teknolojilerin zamanında ve en verimli şekilde teslim edilmesini sağlamaktır. Bu çalışmada savunma sanayinde hizmet veren TUSAŞ firmasının karmaşık bir yapıya sahip olan bir savunma sanayi projesinin takviminde iyileştirme çalışmaları yapılmıştır. Bu çalışmada problem çözmede proje yönetimi tekniklerinden tekniklerinden Program Değerlendirme ve Gözden Geçirme Tekniği (PERT), Gantt Şeması, Delphi Tekniği ve hedef programlama kullanılmıştır. TUSAŞ'ta gerçekleştirilen bu çalışmada firmanın hali hazırda üretmekte olduğu bir ürün için her aşamada proje yönetimi basamakları uygulanmıştır. Söz konusu süreçlerde faaliyetlerin öncül ve ardılları tanımlanarak proje termin süresinin iyileştirme planı hazırlanmış ve devreye alınmıştır. Firmanın proje başlangıç tarihi ve termin tarihi göz önünde bulundurulduğunda verimliliğin anlamlı şekilde arttığı gözlenmiştir. Yapılan detaylı planlama ile proje izlem süreçleri sağlıklı bir şekilde yürütülebilmiş, proje ile ilgili darboğazlara hızlı müdahale olanağı sağlamıştır. Yapılan iyileştirmelerin devamlılığını sağlamak için; geliştirilen sistemde, öngörülen faaliyet süreleri ve gerçekleşmeler veritabanında tutularak yeni projelerde gerçekleşen sapmaların takibini otomatik hale getirmiştir.Bu ve bunun gibi metotların uygulanması ve geliştirilmesi ile termin süreleri ve kaynak kısıtları oldukça önem arz eden Savunma Sanayi Proje takvimlerinin optimize edilmesini sağlayacaktır.

Anahtar kelimeler: PERT, Gantt Şeması, Delphi Tekniği, Hedef Programlama

ABSTRACT

Defense industry projects are of high importance as they are related to the defense of countries. In order for these projects to reach their goals and targeted points, the projects must be planned, managed and monitored effectively. The priority of project management in the defense industry sector is to ensure that advanced military systems and technologies that meet customer expectations and targets are delivered on time and in the most efficient way. In this study, improvement studies were carried out in the calendar of a defense industry project, which has a complex structure, of TAI, which provides services in the defense industry. In this study, the Program Evaluation and Review Technique (PERT), Gantt Chart, Delphi Technique and goal programming from project management techniques were used in problem solving. In this study carried out in TAI, project management steps were applied at every stage for a product that the company is currently producing. In these processes, the antecedents and successors of the activities were defined, and the improvement plan for the project deadline was prepared and put into use. Considering the company's project start date and deadline, it was observed that

productivity increased significantly. With the detailed planning, the project monitoring processes could be carried out in a healthy way, and it provided the opportunity to quickly intervene in the bottlenecks related to the project. To ensure the continuity of the improvements made; In the developed system, projected activity periods and realizations are kept in the database, automating the follow-up of deviations in new projects. The implementation and development of these and similar methods will optimize the Defense Industry Project calendars, which are very important due to deadlines and resource constraints.

Keywords: PERT, Gantt Chart, Delphi Technique, Goal Programming

GÖRÜNTÜ İŞLEME YÖNTEMİ İLE DOĞAL GAZ REGÜLATÖR MONTAJLARINDA VERİMLİLİĞİN ARTTIRILMASI

INCREASING EFFICIENCY IN NATURAL GAS REGULATOR INSTALLATIONS WITH IMAGE PROCESSING METHOD

Duygu ALEMDAR

Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye, Sakarya, Türkiye

ORCID ID: 0009-0000-9727-1584

Hüseyin PEHLİVAN

Prof. Dr. Sakarya Üniversitesi, Mühendislik Fakültesi Makine Müh. Bölümü, Sakarya, Türkiye

ORCID ID: 0000-0003-3048-8986

Ruveyda TOSYA

Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye, Sakarya, Türkiye

ORCID ID: 0009-0000-8113-8995

ÖZET

Bu çalışma; doğalgaz regülatör üretimi yapılan bir firmada, montaj süreçlerinde kullanılan parçaların kamera tespiti ile montaj adımlarını belirlemek üzere yapılmış ve çalışmada görüntü işleme ve derin öğrenmeye dayalı nesne tespiti yöntemlerinden yararlanılmıştır. Teknolojinin gelişimiyle; nesne algılama, ölçüm, renk ayrımı yapmak gibi birçok görüntü işleme özelliğini içerisinde barındıran özel amaçlı kameralar üretilmiştir. Bu kameraların içerisinde yer alan modüller kullanılarak görüntü işleme yapmak ve sistemlere adapte etmek oldukça kolaylaşmaktadır. Bu çalışmada hem özellikleri açısından hem de hız açısından uygulanabilirliği de kolay olan RICOH SC-10A kamera kullanılmıştır. Parçanın düzgün montaj edilmesi, parçaların doku ve rengindeki uygunsuzluklar henüz üretim aşamasında tespit edilip bu sayede üretim sürecinde oluşabilecek hatalar minimize edilecektir. Uygulanan yeni sistem neticesinde birim parça açısından %75-%84 oranında zamandan avantaj, personel oryantasyonun süresinin kısalması, iç kalite oranında artış, ilgili personel sayısında azalma gibi avantajlar sağlanarak üretim verimliliğinin arttırılması sağlanmıştır.

Anahtar kelimeler: Görüntü işleme, montaj, hata tespit.

ABSTRACT

This work; In a company that produces natural gas regulators, it was made to determine the camera detection and assembly steps of the parts used in the assembly processes, and object detection methods based on image processing and deep learning were used in the study. With the development of technology; Special-purpose cameras have been produced, which include many image processing features such as object detection, measurement, color discrimination. By using the modules in these cameras, it becomes very easy to process images and adapt them to the systems. In this study, the RICOH SC-10A camera, which is easy to implement both in terms of its features and speed, was used. Proper assembly of the part, inconsistencies in the texture and color of the parts will be detected during the production phase and thus, the errors that may occur in the production process will be minimized.

As a result of the new system implemented, advantages such as 75%-84% time advantage in terms of unit parts, shortening of staff orientation, increase in internal quality ratio, and reduction in the number of relevant personnel, increased production efficiency.

Keywords: Image processing, assembly, error detection.

DOĞALGAZ HATLARINDA KULLANILACAK YENİ NESİL EMNİYET KAPATMA VANASININ GELİŞTİRİLMESİ

DEVELOPMENT OF NEW GENERATION SAFETY SHUTOFF VALVE TO BE USED IN NATURAL GAS LINES

Atıl ERİM

Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye, Sakarya, Türkiye

ORCID ID: https://orcid.org/0009-0009-6232-8224

Hüseyin PEHLİVAN

Prof. Dr. Sakarya Üniversitesi, Mühendislik Fakültesi Makine Müh. Bölümü, Sakarya, Türkiye

ORCID ID: 0000-0003-3048-8986

ÖZET

Bu çalışma kapsamında 20 Bar Anma Basınçlı Doğalgaz Hatlarında Görev Yapacak Emniyet Kapatma Vanasının Yapısal, Mekanik, Operasyonel ve Ömür Kriterleri Çerçevesinde tasarımı ve prototip ürün imalatı gerçekleştirilmiştir. Muadil ürünlerde kullanılmayan Krameyer Dişli Grubu, Bileşke Yay Grubu, Slider-Cranck Mekanizma ve Kombine Tetikleyici gibi bileşenler yeni üründe kullanılmıştır. Doğalgaz iletim ve dağıtım hatlarında giriş basıncı 100 Bar'a kadar olan gaz basınç ayarlama istasyonlarında kullanılan gaz basınç regülatörleri EN 334 ve EN 14382 standartlarına tabidir. Bu standartlar çerçevesinde belirtilen fonksiyon testleri gerçekleştirilmiştir. Geliştirilen yeni ürünle, Emniyet Kapatma Basıncı Toleransının ±%5 Olması, Tepki Süresinin 1,5 saniyeye düşürülmesi, Basınç Artışına ve düşüşüne olanak sağlaması, Emniyet Kapatma Vana Çalışma Sıcaklık Aralığının -30°C ile 60°C aralığına genişletilmesi, Emniyet Kapatma Vana Ömrünün 200.000 çevrime ulaşması sağlanmıştır.

Anahtar kelimeler: Emniyet Kapatma vanası, Krameyer Dişli, Slider-Crank.

ABSTRACT

Within the scope of this study, the design and prototype product production of the Safety Shutoff Valve to serve in 20 Bar Nominal Pressure Natural Gas Lines was carried out within the framework of Structural, Mechanical, Operational and Life Criteria. Components that are not used in equivalent products such as Rack Gear Group, Composition Spring Group, Slider-Cranck Mechanism and Combined Trigger are used in the new product. Gas pressure regulators used in gas pressure adjustment stations with inlet pressure up to 100 Bar in natural gas transmission and distribution lines are subject to EN 334 and EN 14382 standards. Function tests specified within the framework of these standards were carried out. With the new product developed, Safety Closing Pressure Tolerance is ±5%, Response Time is reduced to 1.5 seconds, Pressure Increase and Decrease is allowed, Safety Shutoff Valve Working Temperature Range is extended to -30°C to 60°C, Safety Shutdown Valve Life is 200,000 cycle has been achieved.

Keywords: Safety Shutoff valve, Rack Gear, Slider-Crank.

DOĞALGAZ REGÜLATÖRLERİNDE KULLANILAN MEMBRANLARDA YAPILAN İYİLEŞTİRME ÇALIŞMASI

IMPROVEMENT WORK ON MEMBRANES USED IN NATURAL GAS REGULATORS

Ruveyda TOSYA

Eska Valve Ar-Ge Merkezi, Sakarya 1. OSB Arifiye, Sakarya, Türkiye

ORCID ID: 0000-0000-0000-0000

Hüseyin PEHLİVAN

Prof. Dr., Sakarya Üniversite, Mühendislik Fakülte, Makine Bölüm, Sakarya, Türkiye

ORCID ID: 0000-0003-3048-8986

ÖZET

Doğalgaz regülatörlerinde kullanılan membranların ticari ürünleri süresince ön görülen çalışma şartlarında verimli bir şekilde çalışmaları öngörülür. Fakat süreç içerisinde dayanım ve performans düşüşünün artışı sonucunda hurda oluşmaya başlar. Buda maliyet, süreç ve işçilik açısından işletmelerin üstesinden gelmesi gereken bir sonuç haline gelir. Bu çalışma kapsamında membran imalatında kullanılan bileşen değiştirilerek uygulanan basınç ve su testlerinde daha uygun olması ve EN549 Kauçuk standartına dayanarak belirlenen kalite ve performans testlerinde başarılı olacak membran geliştirilmesi amaçlanmıştır. Çalışma kapsamında EN549 Standardı gereğince yapılan testler neticesinde geliştirilen üründe 152 N'luk max kuvvete karşılık gelen 387 mm uzama miktarı, 150 MPa'lık kopma kuvveti değerleri elde edilmiştir. Yapılan bu çalışma ile geliştirilen yeni membranın muadiline göre dayanımında %22'lik artışı elde edilmiştir.

Anahtar kelimeler: Regülatör, membran, sızdırmazlık elamanı.

ABSTRACT

Membranes used in natural gas regulators are expected to operate efficiently under the anticipated operating conditions during their commercial products. However, as a result of the increase in strength and performance decrease in the process, scrap begins to form. This becomes a result that businesses have to deal with in terms of cost, process and labor. Within the scope of this study, it is aimed to develop a membrane that will be more suitable in pressure and water tests applied by changing the component used in membrane manufacturing and that will be successful in the quality and performance tests determined based on the EN549 Rubber standard. Scope of work, as a result of the tests carried out in accordance with the EN549 Standard, 387 mm elongation amount corresponding to the maximum force of 152 N and breaking force values of 150 MPa were obtained in the product developed. With this study, a 22% increase in strength was obtained compared to the equivalent of the new membrane developed.

Keywords: Regulator, membrane, sealing element.

HİBRİT HÜCRELERE SAHİP KAFES YAPILARIN EKLEMELİ İMALAT İLE ÜRETİLEBİLİRLİĞİNİN ARAŞTIRILMASI

INVESTIGATION OF ADDITIVE MANUFACTURING OF LATTICE STRUCTURES WITH HYBRID UNIT CELL

Hüseyin KIRATLI

Gazi Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği, Ankara, Türkiye

ORCID ID: 0000-0002-3591-9469

Elmas SALAMCI

Doç. Dr., Doçent, Gazi Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Ankara, Türkiye

ORCID ID: 0000-0003-2856-9402

ÖZET

Eklemeli imalat 3 boyutlu (3B) modellerden nihai ürün elde edilmesinde kullanılan nispeten yeni bir teknoloji olarak karşımıza çıkmaktadır. Eklemeli imalat metodu üretim esnasındaki atıkları azaltarak iyi geometrik hassasiyette parçaların üretimine olanak sağlamaktadır. Süper alaşımlar, alüminyum ve titanyum alaşımları gibi alaşımların kullanıldığı metal eklemeli imalat metodu ise nihai ürün elde edilene kadar metal tozlarının katman katman işlenmesi prensibine dayanmaktadır. Bu metod biyomedikal ve havacılık gibi birçok sektörde yaygın olarak kullanılmaktadır. Az miktarda atık çıkarması ve karmaşık geometrilerin üretimine imkan tanıması gibi avantajlarından dolayı tercih edilmektedir. Metal eklemeli imalat metodları bu tür karmaşık geometrilerden olan kafes yapıların üretimine de olanak sağlamaktadır. Kafes yapılar geometrilerinin yanısıra hafif olmaları ve daha hızlı üretilebilmeleri gibi yönleriyle öne çıkmaktadır. Bu yapılar dikmelerin veya plakaların biraraya gelmesiyle oluşan birim hücrelerin belli bir düzende bir araya gelmesiyle elde edilmektedir. Kafes yapılar morfolojisine göre dikme tabanlı ve yüzey tabanlı olarak ikiye ayrılmaktadır. Bu çalışma kapsamında dikme tabanlı olan hacim merkezli kübik (HMK), yüzey merkezli kübik (YMK) ve bu iki hücrenin birleşiminden meydana gelen hibrit hacim yüzey merkezli kübik (HYMK) birim hücre yapılarından meydana kafes yapılar kullanılmıştır. 3 farklı birim hücre ardından bu birim hücrelerin oluşturduğu kafes yapılar Solidworks yazılımı kullanılarak 3B olarak tasarlanmıştır. Tasarlanan modellerden elektron ışını ile ergitme yöntemiyle Ti6Al4V tozu kullanılarak numuneler üretilmiştir. Numunelerin üretim sonrası geometrilerinin tasarımla olan farklılıklarının ortaya konulması için Arşimet yöntemiyle numunelerin hacimsel boşluk oranları ölçülmüştür. Ayrıca tüm numuneler stereo mikroskopta incelenerek üretim sonrası kolonlardaki kalınlaşmalar ve ergimemiş tozların varlığı incelenmiştir. Arşimet yöntemiyle elde edilen sonuçlara göre tasarım ile üretim hacimsel boşluk oranlarındaki sapmanın en fazla HYMK hibrit birim hücre yapısında, sonrasında YMK ve en az ise HMK birim hücre yapısında meydana geldiği görülmüştür. Hücrelerin hacimsel doluluk oranı arttıkça tasarım ile üretim arasındaki hacimsel boşluk oranlarındaki sapmanın da arttığı görülmüştür. Stereo mikroskop incelemeleri sonucunda birim hücreleri oluşturan dikmelerde kalınlaşmalar oluştuğu ve numunelerin içerisinde sinterlenmiş fakat ergimemiş tozların mevcut olduğu görülmüştür. Bu durumun numunelerin üretim sonrası hacimsel boşluk oranının tasarıma oranla az olmasının temel sebepleri olduğu görülmüştür. Ayrıca numunelerdeki dikme sayısı arttıkça kolonlardaki kalınlaşma ve ergimemiş tozların varlıuğına bağlı olarak tasarım ile üretim sonrası hacimsel boşluk oranları arasındaki sapmanın daha da arttığı sonucuna varılmıştır. Bu çalışmanın, hibrit hücrelere sahip kafes yapıların tek tip hücre içeren kafes yapılara göre üretim sonrası geometrik davranış farklılıklarının inceleneceği çalışmalar için iyi bir kaynak oluşturacağı düşünülmektedir.

Anahtar kelimeler: Eklemeli İmalat, Elektron Işını ile Ergitme, Kafes Yapı, Hibrit Birim Hücre, Ti6Al4V.

ABSTRACT

Additive manufacturing is a relatively new technology used to manufacture final products from 3 dimensional (3D) models. The additive manufacturing method allows the manufacturing of parts with better geometric precision with reduced waste during manufacturing. Metal additive manufacturing method that use alloys such as super alloys, aluminum and titanium alloys is based on the principle of processing metal powders layer by layer until the final product is obtained. This method is widely used in many sectors such as biomedical and aviation. It is preferred because of its advantages such as creating a small amount of waste and allowing the manufacturing of complex geometries. Metal additive manufacturing methods also allow the manufacturing of lattice structures from such complex geometries. Lattice structures stand out with their geometry as well as their light weight structure and faster manufacturing capability. Lattice structures are obtained by combining the unit cells, which are formed by the combination of struts or plates, in a certain pattern. These structures are divided into two as strut-based and surface-based according to their morphology. In the scope of this study, lattice structures consisting of strut-based body-centered cubic (BCC), face-centered cubic (FCC) and hybrid body face-centered cubic (HYMK) unit cell structures formed by the combination of these two cells were used. 3 different type of unit cells and lattice structures were designed as 3D models using Solidworks software. The samples were manufactured by electron beam melting method using Ti6Al4V powder from designed models. In order to reveal the differences between the manufactured sample geometries and design, the porosity of the samples were measured by the Archimedes method. In addition, all samples were examined under a stereo microscope and the thickenings in the columns after manufacturing and the presence of unmelted powders were examined. According to the results obtained by the Archimedes method, it was observed that the deviation in the design and manufacturing highest porosity occurred in the BFCC hybrid unit cell structure, followed by the FCC unit cell structure and the least in the BCC unit cell structure. It was observed that as the occupancy rate of the unit cells increased, the deviation in the porosity between design and production also increased. As a result of stereo microscope examinations, it was observed that thickenings occurred in the struts forming the unit cells and there were sintered but unmelted powders in the samples. It has been observed that this is the reason why the porosities of the samples after manufacturing is less than design. In addition, it was concluded that as the number of struts in the samples increased, the thickening and unmelted powders in the struts further increased the deviation in the porosities between design and manufactured samples. This study will be a good source for studies that will examine the post-production geometric behaviour differences of lattice structures with hybrid unit cells compared to containing single-type cells.

Keywords: Additive Manufacturing, Electron Beam Melting, Lattice Structure, Hybrid Unit Cell, Ti6Al4V.

KAOTİK SAVAŞ STRATEJİSİ OPTİMİZASYON ALGORİTMASI

CHAOTIC WAR STRATEGY OPTIMIZATION ALGORITHM

Muhammed Talha ÇİĞDEM

Fırat Üniversitesi, Fen Bilimleri Enstitüsü, Elazığ, Türkiye

ORCID ID: 0000-0003-2646-392X

Sinem AKYOL

Dr. Öğr. Üyesi, Fırat Üniversitesi, Mühendislik Fakültesi, Elazığ, Türkiye

ORCID ID: 0000-0001-9308-3500

Fatih ÖZYURT

Doç. Dr., Fırat Üniversitesi, Mühendislik Fakültesi, Elazığ, Türkiye

ORCID ID: 0000-0002-8154-6691

ÖZET

Meta-sezgisel algoritmalar, bilgisayar bilimleri ve mühendislik alanlarında, birçok karmaşık optimizasyon probleminin çözümü için kullanılan algoritmaların bir sınıfını temsil ederler. Kaba kuvvet yöntemleri gibi çözümlemeleri daha kısa sürede elde etmek için tasarlanmıştır. Kullanılan temel optimizasyon algoritmalarının performansını artırmak ve değişik optimizasyon teknikleri arasında geçiş yaparak veya bu teknikleri birleştirerek daha iyi sonuçlar elde etmek için kullanılırlar. Bu makalede, kaotik haritaların kullanıldığı bir optimizasyon algoritması olan Kaotik Savaş Stratejisi Optimizasyon Algoritması (Chaotic War Strategy Optimization) (CWSO) önerilmektedir. CWSO, Savaş Stratejisi Optimizasyon Algoritmasının (War Strategy Optimization Algorithm) (WSO) özelliklerini korurken, kaotik haritaların özelliklerini kullanarak algoritmanın performansını artırmayı amaçlar. CWSO, standart WSO'nun temel işleyişini korur: her askerin dinamik olarak savaş alanına doğru hareket ettiği bir optimizasyon süreci olarak modellenen bu algoritmada her asker, bir hedef fonksiyonu optimize etmek için askerlerin davranışına dayalı olarak güncellenir. Ancak CWSO'da, askerlerin hareketleri kaotik haritalar kullanılarak değiştirilir. Bu, askerlerin daha rastgele bir şekilde keşif yapabilmesine olanak tanır ve daha iyi sonuçlar elde edilmesini sağlar. Makalede; CWSO'nun standart WSO, Grey Wolf Optimizer (GWO), Particle Swarm Optimization (PSO) ve Whale Optimization Algorithm (WOA) gibi diğer optimizasyon algoritmalarıyla karşılaştırılmıştır. Sonuçlar, CWSO'nun diğer algoritmalarla karşılaştırıldığında daha yüksek bir optimizasyon başarısı oranı sağladığını gösterir.

Anahtar kelimeler: Optimizasyon Algoritmaları, Kaotik Haritalar, Lojistik Kaotik Harita, Savaş Stratejisi Optimizasyon Algoritması, Kaotik Optimizasyon Algoritması

ABSTRACT

Metaheuristic algorithms represent a class of algorithms used in computer science and engineering for solving many complex optimization problems. It is designed to achieve resolutions in less time, such as brute force methods. They are used to increase the performance of the basic optimization algorithms used and to obtain better results by switching between or combining different optimization techniques. In this article, Chaotic War Strategy Optimization (CWSO), an optimization algorithm using chaotic maps, is proposed. CWSO aims to increase the performance of the algorithm by using the features of chaotic maps while preserving the features of the War Strategy Optimization Algorithm (WSO). CWSO retains the basic operation of standard WSO: modeled as an optimization process where each soldier dynamically moves towards the battlefield, each soldier is updated based on the soldiers' behavior to optimize a target function. But in CWSO, the movements of soldiers are changed using chaotic maps. This allows soldiers to scout more randomly, resulting in better results. In the article; CWSO's standard

WSO has been compared to other optimization algorithms such as Gray Wolf Optimizer (GWO), Particle Swarm Optimization (PSO) and Whale Optimization Algorithm (WOA). The results show that CWSO provides a higher optimization success rate compared to other algorithms.

Keywords: Optimization Algorithms, Chaotic Maps, Logistic Chaotic Map, War Strategy Optimization Algorithm, Chaotic Optimization Algorithm

ANALYTICAL OPTIMAL DESIGN OF NON-CONVENTIONAL TUNED MASS DAMPER WITH NEGATIVE STIFFNESS FOR IMPROVED EFFICIENCY OF STRUCTURAL VIBRATION CONTROL

Okba ABID CHAREF

Ecole Nationale Polytechnique de Constantine, Department of Mechanical Engineering, Constantine, Algeria

ORCID ID: 0000-0003-3070-9451

Mayada BOUAOUN

University of CONSTANTINE3 SALAH BOUBNIDER, Faculty of Process Engineering, Pharmaceutical Engineering, Constantine, Algeria

ABSTRACT

This paper presents a novel approach for mitigating structural vibrations under harmonic excitation by developing a Non-Conventional Tuned Mass Damper with Negative Stiffness (NCNS-TMD). The absorber mass, damping device and stiffness elements of the NCNS-TMD are directly connected to the rigid body to improve the TMD's performance. The mathematical model of the dynamical system is obtained using the compliance method. The H∞ optimal parameters are derived using the Fixed-Points theory to optimize the frequency response function, tuning frequency, damping ratio, and negative stiffness coefficient. The optimum negative stiffness parameter is chosen to ensure the stability of the structure in line with the principle of preload elastic device properties. The proposed optimal design TMD is then compared with the conventional one, and the results demonstrate that the non-conventional TMD with negative stiffness provides the best control performance across the entire frequency range by significantly attenuating resonance vibration amplitudes in primary structures.

Keywords: Non-Conventional Tuned Mass Damper, negative stiffness, H∞ optimization, vibration control performance, mitigation of the resonant vibration amplitude.

HİJYENİK DAVRANIŞ YÖNÜNDEN SELEKTE EDİLMİŞ KAFKAS, KARADENİZ VE KAFKAS X KARADENİZ MELEZİ BAL ARISI POPÜLASYONLARININ GENETİK ÇEŞİTLİLİK DURUMLARININ MİKROSATELLİT MARKÖRLER İLE BELİRLENMESİ

DETERMINATION OF THE GENETIC DIVERSITY STATUS OF CAUCASIAN, BLACK SEA AND CAUCASIAN X BLACK SEA HYBRID HONEY BEE POPULATIONS WHICH ARE BRED FOR HYGIENIC BEHAVIOR USING MICROSATELLITE MARKERS

Fatih BİLGİ

Araştırma Görevlisi, Ondokuz Mayıs Üniversitesi, Ziraat Fakültesi, Tarımsal Biyoteknoloji Bölümü, Samsun, Türkiye

ORCID ID: 0000-0002-8239-2217

Levent MERCAN

Doçent Doktor, Ondokuz Mayıs Üniversitesi, Ziraat Fakültesi, Tarımsal Biyoteknoloji Bölümü, Samsun, Türkiye

ORCID ID: 0000-0002-6790-1458

ÖZET

Bu çalışmada 2021 yılında Ondokuz Mayıs Üniversitesi Ziraat Fakültesi Arıcılık Araştırma ve Uygulama Ünitesi'nde yetiştiriciliği yapılan hijyenik davranış bakımından selekte edilmiş Kafkas arısı, Karadeniz arısı ve bunların melezlenmesi ile elde edilen Kafkas x Karadeniz Melez popülasyonlarının genetik çeşitlilik durumlarının ortaya çıkarılması amaçlanmıştır. Bu popülasyonların genetik çeşitlilik durumu mikrosatelit PCR yöntemi ile FAO tarafından önerilen 30 mikrosatelit lokusu kullanılarak tespit edilmiştir. Elde edilen veriler GenAlEx ve Structure istatistiki analiz yazılımları yardımıyla analiz edilmiştir. Kafkas-Karadeniz, Kafkas-Kafkas x Karadeniz melezi ve Karadeniz-Kafkas x Karadeniz melezi popülasyonları arasındaki genetik mesafe sırasıyla; 0.154, 0.083 ve 0.164 olarak bulunmuştur. Popülasyonlara ait fiksasyon indeksi verileri Kafkas arısı, Karadeniz arısı ve Kafkas x Karadeniz melezi popülasyonları için sırasıyla 0.961, 0.959 ve 0.957 olarak hesaplanmıştır. Analizler sonucunda tüm lokusların ortalama F_{IS}, F_{IT}, F_{ST} ve N_m değerleri sırasıyla 0.959, 0.960, 0.045 ve 12,855 olarak tespit edilmiştir. Çalışmada elde edilen veriler sonucunda Kafkas arısı, Karadeniz arısı ve Kafkas x Karadeniz melezi popülasyonları arasında genetik çeşitliliğin düşük olduğu, popülasyon içinde ve bireyler arasında genetik çeşitliliğin ise yüksek olduğu tespit edilmiştir. GenAlEx yazılımı kullanılarak yapılan Temel koordinatlar analizi ve Structure yazılımı kullanılarak yapılan kümeleme analizi verileri de elde edilen sonuçları doğrulamaktadır. Elde edilen veriler soncunda genetik farklılaşmanın genetik sürüklenmeden değil gen akışından kaynaklı olduğu tespit edilmiştir. Bir popülasyona ait bireylerin sağlıklı bir şekilde yaşamlarını sürdürmelerinde önemli bir etkisi olan genetik çeşitliliğin, kaybedilmemesi önemli görülmektedir. Bu sebeple Türkiye'deki yerli bal arısı genotiplerinin korunması ve sahip oldukları genetik çeşitliliğin sürdürülmesinde, bu genotiplere ait popülasyonların genetik çeşitlilik durumlarının tespit edilmesi önem arz etmektedir.

Anahtar kelimeler: Bal arısı, genetik mesafe, hijyenik davranış, mikrosatelitler.

ABSTRACT

In this study, the genetic diversity of Caucasian honey bees, Black Sea honey bees and their hybrids obtained through the crossbreeding of Caucasian and Black Sea honey bees which were reared and selectively bred for hygienic behaviour at the Apiculture Research and Application Unit of the Faculty of Agriculture at Ondokuz Mayıs University in 2021. The genetic diversity status of these populations was determined using the microsatellite PCR method with 30 microsatellite loci which the FAO recommends. The obtained data were analysed using GenAlEx and Structure software. The genetic

distances between the Caucasian-Black Sea, Caucasian-Caucasian x Black Sea hybrid, and Black Sea-Caucasian x Black Sea hybrid populations were found to be 0.154, 0.083, and 0.164, respectively. The fixation index values for the Caucasian honey bee, Black Sea honey bee, and Caucasian x Black Sea hybrid populations were calculated as 0.961, 0.959, and 0.957, respectively. The average F_{IS}, F_{IT}, F_{ST}, and N_m values for all loci were determined as 0.959, 0.960, 0.045, and 12.855, respectively. The analysis results indicated low genetic diversity among the Caucasian bee, Black Sea bee, and Caucasian x Black Sea hybrid populations. In contrast, high genetic diversity was observed within populations and among individuals. Principal Coordinate Analysis conducted using the GenAlEx software and cluster analysis conducted using the Structure software confirmed the results. The data revealed that genetic differentiation was due to gene flow rather than genetic drift. Preserving genetic diversity, which significantly impacts the healthy survival of individuals within a population, is crucial. Therefore, it is essential to determine the genetic diversity status of populations belonging to indigenous honeybee genotypes in Türkiye to ensure the preservation of these genotypes and their genetic diversity.

Keywords: Genetic distance, honey bee, hygienic behaviour, microsatellites.

BAL ARISINDA (*Apis mellifera* L.) HASTALIK VE PARAZİTLERE KARŞI HİJYENİK DAVRANIŞIN MOLEKÜLER KONTROLÜ

MOLECULAR CONTROL OF HYGIENIC BEHAVIOR AGAINST DISEASES AND PARASITES IN HONEY BEES (*Apis mellifera* L.)

Fatih BİLGİ

Araştırma Görevlisi, Ondokuz Mayıs Üniversitesi, Ziraat Fakültesi, Tarımsal Biyoteknoloji Bölümü, Samsun, Türkiye

ORCID ID: 0000-0002-8239-2217

Levent MERCAN

Doçent Doktor, Ondokuz Mayıs Üniversitesi, Ziraat Fakültesi, Tarımsal Biyoteknoloji Bölümü, Samsun, Türkiye

ORCID ID: 0000-0002-6790-1458

ÖZET

Dünya genelinde, en yaygın üretimi yapılan yüz on beş bitki türünün yaklaşık %70'i bal arıları tarafından tozlaştırılmaktadır. Bitkilerin doğal tozlaşmasına yardımcı olan polinatör sayısındaki azalmanın besin güvenliği ve dolaylı olarak da ekonomi üzerinde önemli etkisi bulunmaktadır. Bu azalmanı; tarım sektöründe verim, ürün kayıpları ve kalite düşüklüğü gibi ekonomik sorunlara neden olabileceği ve biyolojik çeşitlilik kaybına da yol açarak ekolojik dengeyi bozabileceği ön görülmektedir. Polinasyon sürecinde kritik bir öneme sahip olan bal arısı kolonileri; parazitler, toksinler, kötü beslenme ve soğuk havanın etkisi ile strese girebilmektedir. Bu stres koloniyi geri dönülemez ve kolonin çökmesiyle sonuçlanabilecek bir duruma sokabilmektedir. Dünya genelinde bal arısı kolonilerinde en önemli istilacı parazitlerin başında *Varroa destructor* gelmektedir. *Varroa*, hali hazırda koloni kayıplarındaki en önemli etkenlerden biridir. *Varroa* akarı tarafından istila edilmiş koloniler *Varroa*'dan arındırılmaz iseler, bu durum kolonilerin çökmesine yol açabilmektedir. Daha da önemlisi bu durumda parazitin yaşam döngüsüne mücadele edilmediğinden, parazit dolaylı olarak desteklenerek arılıktaki ve hatta aynı bölgedeki diğer kolonilerin risk altına girmesine neden olmaktadır. Bal arıları; bakteri, fungus ve parazitlerin etkisini "hijyenik davranış" ile baskılamaktadır. Bal arılarının *Varroa* parazitine karşı mücadelesinde etkin bir araç olan hijyenik davranışın kalıtımı ve genetik kontrol mekanizmaları henüz tam olarak ortaya çıkarılamamıştır. Daha önceki çalışmalarda, kolonilerde hijyenik davranışın kimyasal olarak yönlendirildiği ve bal arılarının bağışıklık sistemleri tarafından değiştirilebilen kutikular hidrokarbon profillerinin sağlıklı ve hasta bireylerin ayrılmasında kullanıldığı ortaya çıkarılmıştır. Ayrıca, kapağı kapatılmış ölü veya hasta yavruların tespitinin, göz kapağına nüfuz eden uçucu koku sinyallerine dayandığı bildirilmektedir. Hijyenik davranışın kontrolünde etkili olan önemli biyomoleküllerden biri de "Oktopamin" dir. Oktopamin arılarda koku hafızasının oluşumunda ve gelişiminde rol oynayan, hijyenik davranış gibi karmaşık mekanizmaları dolaylı yoldan etkileyen önemli bir nöromodülatördür. Çeşitli çalışmalarda bal arılarında hijyenik davranıştan sorumlu olan genlerin iki ila yedi farklı lokusta bulunduğu bildirilmektedir. Tam olarak etkili bir kimyasal veya fiziksel mücadele yöntemi geliştirilemeyen *Varroa*'ya karşı yüksek düzeyde hijyenik davranış gösteren genotiplerin üretilebilmesi, genomik seleksiyon çalışmaları için uygun moleküler markör setlerinin geliştirilmesini gerektirmektedir. Bu markör setlerinin geliştirilebilmesi için hijyenik davranışı etkileyen genlerin ve moleküler mekanizmalarının ortaya çıkarılması önem arz etmektedir. Bu bildiride bal arısında hijyenik davranışın moleküler mekanizması irdelenmiştir.

Anahtar kelimeler: Bal arısı, genomik seleksiyon, oktopamin, polinasyon, *Varroa destructor*.

ABSTRACT

Approximately 70% of the 115 most commonly cultivated plant species worldwide are pollinated by honey bees, which highlights the significant impact of decreasing pollinator numbers on food security and indirectly on the economy. This decline is predicted to cause economic problems such as reduced agricultural productivity, crop losses, and decreased quality, leading to biodiversity loss and disrupting ecological balance. Honey bee colonies, which play a critical role in pollination, can experience stress due to parasites, toxins, poor nutrition, and cold weather. This stress can push the colony into an irreversible state, ultimately collapsing. *Varroa destructor* is the most significant invasive parasite affecting honey bee colonies worldwide. Varroa is already one of the major factors contributing to colony losses. If colonies infested with Varroa mites are not treated, it can lead to the collapse of the colonies. Moreover, in this situation, by not combating the parasite's life cycle, the parasite is indirectly supported, posing a risk to other colonies within the apiary and even in the same region. Honey bees suppress the effects of bacteria, fungi, and parasites through "hygienic behaviour". The inheritance and genetic control mechanisms of hygienic behaviour, an effective tool in honey bees' fight against Varroa parasites, have not been fully elucidated. Previous studies have revealed that hygienic behaviour in colonies is chemically directed and that cuticular hydrocarbon profiles, which honey bee immune systems can alter, are used to separate healthy individuals from diseased ones. Furthermore, it has been reported that dead or diseased capped brood detection relies on volatile odour signals to penetrate the brood cell capping. Octopamine is one of the critical biomolecules that effectively control hygienic behaviour. Octopamine is a significant neuromodulator that indirectly affects complex mechanisms such as the formation and development of olfactory memory and hygienic behaviour in bees. Various studies have reported that honey bees' genes responsible for hygienic behaviour are found in two to seven different loci. Developing genotypes that exhibit a high level of hygienic behaviour against Varroa, for which an effective chemical or physical control method has not been fully developed, requires the development of suitable molecular marker sets for genomic selection studies. It is crucial to elucidate the genes and molecular mechanisms influencing hygienic behaviour to develop these marker sets. This paper examines the molecular mechanism of hygienic behaviour in honey bees.

Keywords: Genomic selection, honey bee, octopamine, pollination, *Varroa destructor*.

MİKROPLASTİKLERİN BİYODEGRADASYONUNUN ARAŞTIRILMASI VE EKSTRAKSİYON SÜREÇLERİNİN DEĞERLENDİRİLMESİ

THE INVESTIGATION OF BIODEGRADATION OF MICROPLASTICS AND EVALUATION OF THEIR EXTRACTION PROCESSES

Habibe Elif GÜLŞEN AKBAY

Doktor, Mersin Üniversitesi, Mühendislik Fakültesi, Çevre Mühendisliği Bölümü, Mersin, Türkiye

ORCID ID: 0000-0003-1144-9279

Ceyhun AKARSU

Doktor, İstanbul Üniversitesi-Cerrahpaşa, Mühendislik Fakültesi, Çevre Mühendisliği Bölümü, İstanbul, Türkiye

ORCID ID: 0000-0002-0168-9941

ÖZET

Mikroplastiklerin biyodegradasyonu ve ekstraksiyon süreçlerinin değerlendirilmesi, günümüzün en endişe verici çevresel felaketlerinden biri olarak kabul edilmektedir. Bu sorunun çözümü için yapılan yoğun araştırmalar, mikroplastik kirliliğiyle mücadelede sürdürülebilir biyodegradasyon uygulamalarının benimsenmesinin büyük önem taşıdığını ortaya koymaktadır.

Bu derleme çalışması, mikroplastiklerin biyolojik olarak parçalanabilirlik özelliklerini değerlendirmeyi amaçlayarak farklı araştırmalardan elde edilen bulguları bir araya getirmektedir. Mikroplastiklerin doğal ortamlarda biyodegradasyon potansiyelleri, çeşitli çevresel koşullarda laboratuvar deneyleri ve saha çalışmalarıyla incelenmiştir. Bu çalışmalarda, mikroplastiklerin doğal çevre koşullarında nasıl bozunduğu, mikroorganizmaların etkisi ve çevresel faktörlerin rolü araştırılmıştır. Mikroorganizmaların mikroplastikler üzerinde biyolojik aktiviteleri, bu sürecin başarıyla gerçekleşmesinde önemli bir faktör olarak kabul edilmektedir.

Biyodegradasyon çalışmalarının yanı sıra, mikroplastiklerin çevreden etkin bir şekilde izole edilmesi ve analiz için uygun hale getirilmesi de büyük önem taşımaktadır. Çünkü mikroplastiklerin uygun bir şekilde izole edilmesi, yüksek ekstraksiyon verimliliği, partiküllerin korunması ve doğru veri eldesi için kritik bir adımdır. Bununla birlikte, belirtilen bu yöntemlerin uygulanabilirliği üst düzey ve yüksek maliyetli prosedürleri de içerebildiğinden her laboratuvarda uygulanmaya elverişli olmayabilir. Benzer şekilde, günümüzde mikroplastik tespitine dair literatür araştırmaları genişlemeye devam ettikçe, mikroplastik izolasyonuna dair yeni yaklaşımların ortaya çıkması ve cihazların örnek tanımlama kapasitelerinin artması muhtemeldir. Bu nedenle mikroplastik izolasyonunun şu an için geliştirilemeyecek şekilde standardize edilmesi neredeyse mümkün değildir. Bu nedenle belirli bir matristeki mikroplastiğin izolasyonu için yöntem tasarlanırken, numune toplama, analizlerin gerçekleştirilmesi, tekrarlı analizlerin güvenilir sonuç vermesi ve bunların yorumlamasına kadar gerekli tüm adımlar ele alınmalıdırBu noktada uygulanması gereken ekstraksiyon türü mikroplastiklerin bulunduğu matrise özgü olduğundan ve ayrıca ekstraksiyon yöntemi mikroplastik türleri arasında değişiklik gösterebileceğinden yöntem seçimi daha karmaşık ve zor hale gelmektedir. Bu çalışma kapsamında, mikroplastiklerin degradasyon çalışması sonrası ortamdan etkin bir şekilde toplanması ve analiz için uygun hale getirilmesi amacıyla kullanılan izolasyon ve ekstraksiyon yöntemleri de ele alınmıştır. Farklı ekstraksiyon yöntemleri, mikroplastiklerin doğru bir şekilde tespit edilmesi ve sayılması için kritik bir adım olarak değerlendirilmektedir. Bu çalışmalarda, farklı ortamlarından mikroplastiklerin ayrıştırılması için filtreleme, eleme, santrifüjleme, basınç farkından yararlanma, kimyasal ekstraksiyon ve yoğunluk gradyanı yöntemleri gibi tekniklerin etkinliği ve verimliliği incelenmiştir.

Bu derleme çalışması, mikroplastiklerin çevresel etkilerini anlama ve çevre sağlığı açısından potansiyel risklerini değerlendirme çabalarına katkı sağlamaktadır. Ayrıca, gelecekteki araştırmaların ve yöntem

geliştirmelerinin yönünü belirleyebilecek temel bir kaynak olarak hizmet etmektedir. Mikroplastiklerin biyodegradasyonu ve ekstraksiyon süreçlerinin daha da ilerletilmesi, mikroplastik kirliliğinin azaltılması ve sürdürülebilir bir çevre için önemli bir adım olacaktır.

Anahtar kelimeler: Plastik Kirliliği, Mikroplastik, Biyodegredasyon, Ekstraksiyon Süreçleri, Çevresel Etkiler.

ABSTRACT

The assessment of microplastic biodegradation and extraction processes is considered one of today's most concerning environmental disasters. Intensive research efforts have shown the importance of using sustainable biodegradation processes to combat microplastic pollution.

This review aims to assess the biodegradability properties of microplastics by bringing together findings from different studies. The biodegradation potential of microplastics in the natural environment has been investigated in laboratory experiments and field studies under different environmental conditions. These studies investigate how microplastics degrade under natural conditions, the influence of microorganisms and the role of environmental factors. The biological activities of microorganisms on microplastics are recognized as important factors in the success of this process.

In addition to studies on biodegradation, effective isolation and preparation of microplastics are also important for analysis. Proper isolation of microplastics is critical for high extraction efficiency, particle preservation and obtaining accurate data. However, the applicability of the above methods can involve complex and costly procedures, so they cannot be used in every laboratory. As the literature review on microplastic detection continues to grow, it is likely that new approaches to isolating microplastics will be developed and the capabilities of sample characterization devices will increase. Therefore, it is almost impossible to standardise the isolation of microplastics to the point where it cannot be further developed. Therefore, when developing a method for isolating microplastics from a given matrix, all the necessary steps should be considered, including taking samples, performing analyses, ensuring reliable results from repeated analyses and interpreting them.

This study also discussed the isolation and extraction methods that can effectively collect microplastics from the environment and prepare them for analysis. Various extraction techniques such as filtration, sieving, centrifugation, pressure difference based methods, chemical extraction and density gradient methods were evaluated for their effectiveness and efficiency in separating microplastics from different environments. In addition, microscopic and spectroscopic techniques were used to determine the type and size of the microplastic.

This review helps to understand the impact of microplastics on the environment and assess their potential risks to environmental health. It also serves as a basic resource that can guide future research and method development. Promoting the biodegradation and extraction of microplastics is a crucial step towards reducing microplastic pollution and creating a sustainable environment.

Keywords: Plastic Pollution, Microplastics, Biodegradation, Extraction Processes, Environmental Impacts

SU AYAK İZİ VE SÜRDÜRÜLEBİLİR KALKINMA HEDEFLERİ İLE ENDÜSTRİYEL SU YÖNETİMİ: SOĞUK HADDELEME ve GALVANİZ ENDÜSTRİSİ ÜZERİNE BİR ARAŞTIRMA

WATER FOOTPRINT AND INDUSTRIAL WATER CONSERVATION WITH SUSTAINABLE DEVELOPMENT GOALS: A RESEARCH ON THE COLD MILLING - GALVANIZING INDUSTRY

Tamer ÇANKAYA

Yüksek Mühendis, İstanbul Teknik Üniversitesi, İnşaat Fakültesi, Çevre Mühendisliği Bölümü, İstanbul, Türkiye

Çevre ve Yardımcı Tesisler Birim Yöneticisi, Borçelik, Bursa, Türkiye

Ceyhun AKARSU

Doktor, İstanbul Teknik Üniversitesi, İnşaat Fakültesi, Çevre Mühendisliği Bölümü, İstanbul, Türkiye

ORCID ID: 0000-0002-0168-9941

Tuğba ÖLMEZ-HANCI

Profesör Doktor, İstanbul Teknik Üniversitesi, İnşaat Fakültesi, Çevre Mühendisliği Bölümü, İstanbul, Türkiye

ORCID ID: 0000-0001-9200-5420

ÖZET

İnsanlar, içme suyu, tarımsal sulama, endüstriyel üretim ve enerji üretimi gibi farklı amaçlarla suya ihtiyaç duymaktadır. Dünya nüfusunun hızla arttığını göz önünde bulundurduğumuzda böylesi bir talep, su kaynaklarının sınırlı olduğu gerçeğiyle karşı karşıya olduğumuzu göstermektedir. Ayrıca, iklim değişikliği su kaynaklarını da etkilemekte, kuraklık, sel, buzulların erimesi gibi iklim değişikliklerine bağlı olaylar su kaynaklarının miktarını ve kalitesini etkilemektedir. Bu durum su stresinin daha da artmasına neden olmaktadır.

Su ayak izi, sürdürülebilir kalkınma hedefleri bağlamında önemli bir gösterge olarak değerlendirilmektedir. Su ayak izi hesaplamaları, su tüketiminin ve kullanımının etkilerini ölçerek su yönetimi stratejilerinin belirlenmesine yardımcı olmaktadır. Bu hesaplamalar, su kaynaklarının sürdürülebilir bir şekilde kullanılmasını teşvik ederken, su tasarrufu önlemlerinin geliştirilmesine ve uygulanmasına katkıda bulunur.

Atıksu arıtma tesislerinin su ayak izi hesaplamaları, arıtma sürecinde kullanılan su miktarının azaltılması ve geri kazanılması, su kaynaklarının daha etkin bir şekilde kullanılmasını sağlamaktadır. Bu da su tüketiminin azalmasına ve su kaynaklarının daha sürdürülebilir bir şekilde yönetilmesine olanak tanımaktadır.

Soğuk haddeleme ve galvaniz endüstrisi, atıksu arıtma tesislerinin su ayak izinin belirlenmesi açısından özel bir öneme sahiptir. Soğuk haddeleme çeliğin baskı ve gergiyle istenilen kalınlığa indirilmesi işlemidir. Galvanizleme işlemi ise, metallerin korozyona karşı korunması amacıyla kullanılan bir yüzey kaplama yöntemidir. Bu işlem sırasında ortaya çıkan atıksular, çeşitli kimyasal ve organik bileşikler içerebilir ve su kaynaklarına potansiyel olarak zarar verebilir. Dolayısıyla bu çalışma kapsamında, atık su arıtma tesislerinde su ayak izi için uygulanabilir bir yöntem önermek, göstergeler üretmek ve uygulama örneğini sunmak amacıyla haddeleme galvaniz endüstrisi atıksu arıtma tesisi (HGEAAT) incelenmiştir. Ayrıca diğer çalışmalardan farklı olarak yeşil su ayak izi de değerlendirilmeye dahil edilmiştir.

Çalışma sonucunda, HGEAAT'nin su ayak izinin yaklaşık %70'ini WF_{Gri}, yaklaşık %30'unu ise WF_{Mavi} oluşturmaktadır. $WF_{Yeşil}$, HGEAAT WF'sine sadece %0,3'lük bir katkıda bulunmaktadır. WF_{Gri}'nin

%97'si HGEAAT'den deşarj edilen kirleticilerden kaynaklanmakta, kalan kısmı ise atıksuyun arıtılması için kullanılan kimyasallardan ve arıtma çamurlarının bertarafından kaynaklanmaktadır. Toplam WF_{Mavi} kaynaklarına göre değerlendirildiğinde, %37'si kayıp, %33'ü arıtma tesisi işletmesi için kullanılan temiz su ve %26'sı elektrik tüketimi olup, toplam WF_{Mavi}'nin %96'sını oluşturmaktadır. HGEAAT çıkışında, bakiye kirleticilerin içinde en yüksek WF değerine sahip parametre olarak toplam azot tespit edilmiştir.

Atık su arıtma tesisleri yapıları gereği özellikle gri su ayak izini azaltmalar nedeniyle su ayak izi çalışmalarında önemli bir role sahiptir. Bu nedenle, atık su arıtma tesisleri için daha fazla su ayak izi çalışması yapılması gerektiği düşünülmektedir. Çalışma sayısının artmasıyla değerlendirme yönteminin standartlaşacağı ve veri kaynaklarının çoğalacağı öngörülmektedir. Bu durum, ileride yapılan çalışmaların tutarlılığı ve kıyaslanabilirliği açısından son derece önemlidir.

Anahtar kelimeler: Su Ayak İzi, Soğuk Haddeleme, Galvaniz Endüstrisi, Atıksu Arıtma Tesisi, Sürdürülebilir Su Yönetimi, İklim Değişikliği ve Su, Gri Su Ayak İzi

ABSTRACT

People need water for various purposes such as drinking, agricultural irrigation, industrial production and energy generation. Considering the rapidly increasing global population, this demand highlights the fact that we are faced the limited water resources. Additionally, climate change is affecting water resources, with events such as droughts, floods and melting glaciers are affecting the quantity and quality of water sources. Consequently, this situation further intensifies water stress.

The concept of Water Footprint is considered a significant indicator within the context of the Sustainable Development Goals. Water footprint calculations aid in measuring the impact of water consumption and usege, and assist in the formulation of water management strategies. These calculations promote the sustainable use of water resources while contributing to the development and implementation of water-saving measures.

The calculation of water footprints for wastewater treatment plants facilitate the reduction and recovery of water used in the treatment process, thereby enabling more efficient use of water resources. This, in turn, leads to a decrease in water consumption and promotes the sustainable management of water resources.

The Cold Rolling and Galvanizing industries hold particular importance in determining the water footprint of wastewater treatment plants. Cold rolling involves the process of reducing the thickness of steel through pressure and tension, while galvanizing is a surface coating method used to protect metals from corrosion. The effluents generated during these processes may contain various chemical and organic compounds that have the potential to negatively impact water sources. Therefore, this study focused on the Hadronic Galvanizing Wastewater Treatment Plant (HGEAAT) to propose an applicable methodology, develop indicators and present a case study for the water footprint in wastewater treatment plants. Additionally, unlike previous studies, the assessment also included the evaluation of the green water footprint.

The study revelaed that approximately 70% of HGEAAT's water footprint is attributed to WF_{Grey}, while about 30% is accounted for WF_{Blue}. The contribution of WF_{Green} to HGEAAT's water footprint is only 0.3%. Among WF_{Grey}, 97% is determined to orginate from pollutants discharged by HGEAAT, while the remaining share is resulting from chemicals used in wastewater treatment and sludge disposal. Evaluation based on total WF_{Blue} Sources indicates that 37% is attributed to losses, 33% to clean water consumption for plant operation, and 26% to electricity consumption, collectively constituting 96% of the total WF_{Blue}. Total nitrogen has been identified as the parameter with the highest WF value among the residual pollutants at the outlet of HGEAAT.

Wastewater treatment plants play a crucial role in reducing the grey water footprint due to their inherent structures. Consequently, they hold significance in water footprint studies. Therefore, it is recommended to conduct more research on the water footprint of wastewater treatment plants. With an increased number of studies, it is anticipated that the assessment methodology will become standardized and the

availability of data sources will expand. This standardization and data availability are vital for ensuring consistency and comparability in future studies.

Keywords: Water Footprint, Cold Rolling, Galvanizing Industry, Wastewater Treatment Plant, Sustainable Water Management, Climate Change and Water, Grey Water Footprint

ENERJİ VERİMLİ RTOS TASARIMLARI VE GÜÇ YÖNETİMİ STRATEJİLERİ

ENERGY-EFFICIENT RTOS DESIGNS AND POWER MANAGEMENT STRATEGIES

Hüseyin Cem KOÇ

Ege Üniversitesi, Fen Bilimleri Enstitüsü, Mekatronik Mühendisliği, İzmir, Türkiye

ORCID ID: 0000-0002-1090-3348

Mustafa ENGİN

Dr. Öğr. Üyesi, Ege Üniversitesi, Ege Meslek Yüksekokulu, Elektronik ve Otomasyon Bölümü, İzmir, Türkiye

ORCID ID: https://orcid.org/0000-0001-7247-4545

ÖZET

Bu bildiri, enerji verimli gerçek zamanlı işletim sistemleri (RTOS) tasarımları ve güç yönetimi stratejileri konusunu ele almaktadır. Enerji verimliliği günümüzde büyük önem taşımaktadır, çünkü taşınabilir cihazlar, akıllı sensörler ve diğer gömülü sistemler gibi birçok elektronik cihaz pil gücüyle çalışmaktadır.

RTOS tasarımları, sistemlerin enerji tüketimini optimize etmek için kullanılan birçok teknik içermektedir. İşlemcilerin enerji verimliliğini artıran düşük güç modları, görevlerin dinamik önceliklendirilmesi ve zamanlama stratejileri gibi yöntemler bu tasarımların temel unsurlarıdır. Ayrıca, uyku modu ve işlemci frekansının dinamik olarak ayarlanması gibi teknikler de enerji tüketimini optimize etmeye yardımcı olmaktadır.

Güç yönetimi stratejileri, cihazların enerji tasarrufu yapmasını ve verimli bir şekilde çalışmasını sağlamak için kullanılan yöntemlerdir. Bu stratejiler, dinamik voltaj ve frekans ölçeklendirme (DVFS), işlemci çekirdeklerinin uyku moduna geçirilmesi, bellek yönetimi ve görev zamanlaması optimizasyonu gibi çeşitli teknikler içerebilir.

Bu bildiri, enerji verimli RTOS tasarımları ve güç yönetimi stratejileri konusunda bir derleme sunmaktadır. Enerji tasarrufu için kullanılan çeşitli tekniklerin avantajları ve dezavantajları tartışılmaktadır. Örneğin, düşük güç modları, işlemcinin enerji tüketimini azaltarak pil ömrünü uzatmada etkili olabilir, ancak bazı durumlarda işlemci performansını sınırlayabilir.

Ayrıca, bu tasarımların gerçek zamanlı sistem performansı üzerindeki etkileri ve enerji tüketimi ile performans arasındaki dengeyi sağlamak için yapılan optimizasyonların önemi vurgulanmaktadır. Sonuç olarak, bu çalışma, enerji verimli RTOS tasarımları ve güç yönetimi stratejilerinin, elektronik sistemlerin enerji tüketimini azaltmada ve pil ömrünü uzatmada önemli bir rol oynadığını ortaya koymaktadır. Enerji verimli RTOS tasarımları ve güç yönetimi stratejileri, gömülü sistemlerin daha uzun pil ömrüne sahip olmasını sağlayarak, enerji maliyetlerini azaltmaya ve çevresel etkiyi en aza indirmeye yardımcı olmaktadır. Bu alanda yapılan ilerlemeler, gelecekte daha verimli ve sürdürülebilir elektronik cihazlar için büyük bir potansiyel sunmaktadır.

Anahtar kelimeler: enerji verimli RTOS, güç yönetimi stratejileri, gömülü sistem

ABSTRACT

This paper discusses energy-efficient real-time operating system (RTOS) designs and power management strategies. Energy efficiency is of great importance today as many electronic devices such as portable devices, smart sensors and other embedded systems operate on battery power.

RTOS designs encompass various techniques used to optimize the energy consumption of systems. Methods such as low power modes that enhance the energy efficiency of processors, dynamic

prioritization of tasks and timing strategies are fundamental aspects of these designs. Additionally, techniques such as sleep mode and dynamic adjustment of processor frequency help optimize energy consumption.

Power management strategies are the methods used to enable devices to save energy and operate efficiently. These strategies may involve various techniques such as dynamic voltage and frequency scaling (DVFS), putting processor cores into sleep mode, memory management and task scheduling optimization.

This paper provides a compilation of energy-efficient RTOS designs and power management strategies. The advantages and disadvantages of various techniques used for energy conservation are discussed. For example, low power modes can be effective in extending battery life by reducing the power consumption of the processor but may limit processor performance in some cases.

Furthermore, the impact of these designs on real-time system performance and the significance of optimizations to strike a balance between energy consumption and performance are emphasized. Ultimately, this work highlights the crucial role of energy-efficient RTOS designs and power management strategies in reducing energy consumption in electronic systems and extending battery life. Energy-efficient RTOS designs and power management strategies help embedded systems to have longer battery life, reduce energy costs and minimize environmental impact. Advances in this area offer great potential for more efficient and sustainable electronic devices in the future.

Keywords: energy-efficient RTOS, power management strategies, embedded system

PATATES GÜVESİ'NİN BİYOLOJİK MÜCADELESİNDE ETKİLİ PARAZİTOİTİN SEÇİMİ

SELECTION OF EFFECTIVE PARASITOIDS FOR THE BIOLOGICAL CONTROL OF POTATO TUBER MOTH

Emine KAYA

Ankara University, Faculty of Agriculture, Department of Plant Protection, Ankara, Türkiye

ORCID ID: 0000-0002-3453-9552

Hatice Kübra ÖZMEN

Ankara University, Faculty of Agriculture, Department of Plant Protection, Ankara, Türkiye

ORCID ID: 0000-0003-3470-384X

Cem ÖZKAN

Prof.Dr. Ankara University, Faculty of Agriculture, Department of Plant Protection, Ankara, Türkiye

ORCID ID: 0000-0002-2795-167X

ÖZET

Dünya genelinde patates üretimi; zararlılar, hastalıklar ve yabancı otların neden olduğu önemli zorluklarla karşı karşıyadır. Patates Güvesi **[**(*Phthorimaea operculella*) (Zeller) (Lepidoptera: Gelechiidae)**]**, patates üretiminde önemli derecede hasarlara neden olan zararlılardan biridir. Patates Güvesi ile mücadelede genel olarak kimyasal mücadele kullanılmaktadır. Kimyasal mücadelenin yoğun ve bilinçsiz olarak kullanımı ise biyolojik çeşitlilik ve gıda güvenliği konularında endişelere yol açmaktadır. Alternatif olarak biyolojik mücadele uygulamaları, sürdürülebilir ve çevre dostu bir yaklaşımlar sunmaktadır. Bu çalışmada, Patates Güvesi'nin doğal düşmanlarından üç parazitoit türünün (*Trichogramma evanescens*, *Bracon hebetor* ve *Chelenus oculator*) etkinliği biyolojik mücadele açısından değerlendirilmiştir. Denemeler 25±1°C sıcaklık , %60-70 nispi nem ve 16:8 saat aydınlık: karanlık koşulların sağlandığı iklim odalarında gerçekleştirilmiştir. Denemelerde *T. evanescens* ve *C. oculator* için konukçu olarak Patates Güvesi'nin 0-24 saat yaşlı yumurtaları kullanılmıştır. *B. hebetor* için ise Patates Güvesi'nin olgun dönem larvaları kullanılmıştır. Gerçekleştirilen konukçu uygunluğu denemelerinde kriter olarak parazitoitlerin gelişme süresi, çıkış oranı ve fertilite durumlarını ele alınmıştır. *T. evanescens, B. hebetor* ve *C. oculator*'un Patates Güvesi üzerinde gelişme süresi sırasıyla 9, 16 ve 58 gün bulunmuştur. Parazitlenen Patates Güvesi üzerinde *T. evanescens, B. hebetor* ve *C. oculator*'un çıkış oranları sırasıyla % 88,50, 77.50 ve 15 olarak bulunmuştur. Çıkış yapan *T. evanescens, B. hebetor* ve *C. oculator*'un çiftleştikleri ve yeni döller oluşturdukları belirlenmiştir. Sonuçlar her üç parazitoit türünün de Patates Güvesi'ni başarılı bir şekilde parazitleyerek sağlıklı ergin bireyler oluşturduğu ve bu bireylerin de fertil oldukları belirlenmiştir. Bu sonuçlar her üç parazitoitin de Patates Güvesi'nin biyolojik mücadelesinde kullanma potansiyeli olduğunu göstermektedir. Ancak biyolojik mücadele programlarında bu üç parazitoitten hangisinin öncelikle kullanılacağının belirlenmesi için daha detaylı çalışmalar gerekmektedir.

Anahtar kelimeler: Patates Güvesi, biyolojik mücadele, *Trichogramma evanescens, Bracon hebetor, Chelonus oculator*, konukçu-parazitoit ilişkileri

ABSTRACT

Potato production worldwide; faces significant challenges caused by pests, diseases and weeds. Potato Moth [(*Phthorimaea operculella*) (Zeller) (Lepidoptera: Gelechiidae)] is one of the pests that cause significant damage to potato production. Chemical control has generally used to control the Moth. Intensive and unconscious use of chemical control causes concerns about biodiversity and food safety.

As an alternative, biological control applications offer a sustainable and environmentally friendly approach. In this study, the effectiveness of three parasitoid species (*Trichogramma evanescens*, *Bracon hebetor* and *Chelenus oculator*), which are natural enemies of the Potato Moth, was evaluated in terms of biological control. The experiments were carried out in climate rooms with 25±1°C temperature, 60-70% relative humidity and 16:8 hours light: dark conditions. In the experiments, 0-24 hour old eggs of Potato Moth were used as hosts for *T. evanescens* and *C. oculator*. As hosts, mature larvae of Potato Moth were used for *B. hebetor*. Development time, emergence rate and fertility status of parasitoids were considered as criteria in the host suitability trials. The development time of *T. evanescens*, *B. hebetor* and *C. oculator* on Potato Moth was 9, 16 and 58 days, respectively. The emergence rates of *T. evanescens*, *B. hebetor* and *C. oculator* on the parasitized Potato Moth were 88.50, 77.50 and 15%, respectively. It was determined that the departing *T. evanescens*, *B. hebetor* and *C. oculator* mated and formed new offspring. The results showed that all three parasitoid species successfully parasitized the Potato Moth and formed healthy adult individuals and these individuals were also fertile. These results show that all three parasitoids have the potential to be used in the biological control of Potato Moth. However, more detailed studies are needed to determine which of the three parasitoids will be used primarily in biological control programs.

Keywords: Potato Moth, biological control, *Trichogramma evanescens*, *Bracon hebetor*, *Chelonus oculator*, host-parasitoid relationships

BLOCKCHAIN TECHNOLOGY IN HEALTHCARE AND REAL ESTATE

Arijan MUSLIJEVIC

AAB College, Computer Science, Cyber Security, Prishtine, Kosova

Muzafer MOLLAZEQIRI

AAB College, Computer Science, Cyber Security, Prishtine, Kosova

Erjon COBA

AAB College, Computer Science, Cyber Security, Prishtine, Kosova

Ersan HAMDIU

AAB College, Computer Science, Cyber Security, Prishtine, Kosova

ORCID ID: 0009-0003-8938-0096

Abstract

Blockchain technology, introduced in 2009, has experienced a continuous surge in interest and intrigue. Its exceptional attributes, including heightened security, data integrity, and anonymity, without the need for intermediaries, have captured the attention of individuals and industries alike. Financial institutions were among the first to recognize its potential as a novel payment system, but the influence of blockchain extends far beyond financial transactions. The allure lies in its vast potential across multiple domains, sparking curiosity and driving exploration in various industries. Numerous use cases have already been discovered as a result of the adaptability and disruptive potential of blockchain technology. The future seems promising, and it is hoped that even more creative applications will be found. This study paper's goal is to assess the blockchain technology's potential future applications by outlining its key ideas, highlighting their importance, and proving their importance. It also illuminates the difficulties in maximizing blockchain's potential. It also clarifies the difficulties in fully employing blockchain technology. The article provides convincing examples that highlight the practical use cases of this technology by exploring prospective areas where blockchain can have a significant influence. Understanding the impact and implications of adopting blockchain technology is crucial for stakeholders seeking to capitalize on its benefits. We can create the conditions for a future that is more decentralized and effective by exploring its promise and tackling the challenges it presents. Blockchain technology has the potential to change how we do business and interact with digital systems, as well as alter many existing sectors. This is where its transformational power rests. And last, the advancement of blockchain technology offers a glimpse into a world where online transactions depend heavily on transparency and trust. By comprehending the fundamental ideas behind blockchain technology, identifying workable applications, and acknowledging its difficulties, we can shape a future in which decentralized systems play a crucial role in promoting creativity and revolutionizing industries.

Keywords: blockchain, importance, future, challenges

DEĞER AKIŞ HARİTALAMA İLE İŞ MAKİNELERİ PARÇA ÜRETİMİNDE YALIN ÜRETİM UYGULAMASI

Erkan Sami KÖKTEN

Doktor Öğretim Üyesi, Karabük Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Karabük, Türkiye

ORCID ID: 0000-0003-3428-4534

Beyza KOÇ

Karabük Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Karabük, Türkiye

ORCID ID: 0009-0003-9291-305X

ÖZET

Üretim yapan işletmeler, faaliyetlerini daha verimli hale getirerek ve sınırlı kaynaklarını en uygun şekilde kullanarak maksimum fayda sağlamayı hedeflerler. Yalın üretim tekniği, işletmelerin israfını minimize ederek finansal açıdan ekonomik ve kalite standartlarına uygun ürünler elde etmelerini sağlar. Yalın üretimde başarı için öncelikle israfın tam olarak anlaşılması gerekmektedir. Yalın üretim yöntemlerinden biri olan değer akış haritalama, müşteri talebinden, hammadde tedariği ve ürün teslimine kadar olan süreçte malzeme ve bilgi akışını aynı anda görsel olarak sunmaktadır. Değer akış haritaları hammaddenin tedariğinden çıktısına kadar geçen süreç boyunca bir mamul üzerinde değer katan ve katmayan tüm sürecin tamamını oluşturmaktadır. Değer akış haritalama tek bir ürüne yönelik olarak yapılmaktadır ve öncelikle ürün ailesinin belirlenmesi gerekmektedir. Bu çalışmada, ürün ailesi olarak iş makineleri parçaları üreten bir firmanın yakıt ve hidrolik depoları üretim süreci seçilmiştir. İlgili süreçte sırasıyla lazer kesim, büküm, kaynaklı imalat, temizlik, sızdırmazlık testi, kalite kontrol, boya, iç temizlik ve paketleme işlemleri uygulanmaktadır. Her bir sürece ilişkin işlem süreleri, hazırlık zamanı, çalışma süresi, takt zamanı, işçi ve makine sayısı, envanter, sevkiyat ve tedarik bilgileri belirlenerek mevcut durum değer akış haritası hazırlanmıştır. Mevcut durum analizi sonucunda lazer kesimi ve büküm işlemi tamamlanan parçaların ara stok bekleme alanında karmaşıklığa neden olduğu ve parça takibini güçleştirdiği belirlenmiştir. Sorgulama neticesinde süreç genelinde parça takibinin düzenli bir şekilde yapılamadığı ve bunun üretimde zaman, işçilik ve malzeme gibi kayıplara ve kalite problemlerine neden olduğu gözlemlenmiştir. Süreçte 5S ve Kaizen gibi yalın üretim araçlarının kullanımının kayıpları kayda değer oranda azaltacağı sonucuna ulaşılmıştır.

Anahtar kelimeler: Yalın Üretim, Değer Akış Haritalama, İsraf, 5S, Kaizen, Metal Sanayi.

ABSTRACT

Manufacturing companies aim to achieve maximum benefit through more efficient operations and optimal utilization of limited resources. Lean production enables companies to minimize waste and obtain economically viable products that meet quality standards. In lean production, it is essential to define waste to achieve success. Value stream mapping, one of the lean production methods, visually presents the flow of materials and information from customer demand to raw material supply and product delivery. Value stream maps encompass the entire process, including value-adding and non-value-adding activities, from raw material supply to product delivery. Value stream mapping is conducted for a specific product family, and it requires initial identification of the product family. In this study, the production process of fuel and hydraulic tanks of a company that produces machine parts was chosen as the product family. The relevant process involves laser cutting, bending, welding, cleaning, leak testing, quality control, painting, internal cleaning, and packaging operations. By determining the processing time, setup time, cycle time, number of workers and machines, inventory, shipment, and supply information for each operation, the current state value stream map was prepared. Based on the current state analysis, it has been determined that the stock area is complex after the laser

cutting and bending operations, which makes part tracking challenging. The analysis also revealed that part tracking was not being conducted consistently throughout the process, resulting in losses of time, labor, materials, and quality issues. The utilization of lean production tools such as 5S and Kaizen in the process was found to reduce these losses significantly.

Keywords: Lean Production, Value Stream Mapping, Waste, 5S, Kaizen, Metal Industry.

SMED METODOLİJİSİ ve TAGUCHI DENEY TASARIMI: PLASTİK SEKTÖRÜNDE BİR UYGULAMA

Erkan Sami KÖKTEN

Doktor Öğretim Üyesi, Karabük Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Karabük, Türkiye

ORCID ID: 0000-0003-3428-4534

Nida TOPUZ

Karabük Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Karabük, Türkiye

ORCID ID: 0009-0008-6589-7337

Zeyneb Beyza KILIÇ

Karabük Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Karabük, Türkiye

ORCID ID: 0009-0000-9833-8533

ÖZET

Günümüzde işletmeler ağır rekabet şartlarında çalışmaktadır. Bu rekabet ortamı işletmelerin kendilerini geliştirmesini ve iyileştirmesini gerektirmektedir. Geçmişten günümüze işletmeler çeşitli yöntemler ile amaca yönelik iyileştirme çalışmalarını sürdürerek tercih edilir hâle gelmeye çalışmışlardır. Yalın üretim işletmelerin minimum kaynakla, kısa sürede, hatasız, kaliteli ve standart iş adımlarıyla en uygun üretime veya hizmete ulaşabilmeleri için yol göstericidir. Yalın üretim çeşitli alt disiplinlere sahiptir ve farklı yöntemlerle birlikte iyileştirme çalışmalarında kullanılabilmektedir. Zaman kayıplarını azaltmak için kullanılan yöntemlerden birisi olan SMED (Single-Minute Exchange of Die) işletmeler tarafından artan bir ilgi görmektedir. SMED metodu tekli dakikalarda kalıp değişimi anlamına gelmektedir ve temel amacı, kurulum süresini 10 dakikadan daha az bir süreye indirmektir. Bu metot seri üretimde, daha az zaman kaybederek üretim hızını ve verimliliği arttırmada önem arz etmektedir. Süreçlerde oluşan zaman kayıpları birçok nedenden kaynaklanabilmektedir. Makine kalıp değişiminde kaybedilen süre bu konuda önemli bir yere sahiptir. Deney tasarım yöntemlerinden birisi olan Taguchi metodu ürün veya süreç kalitesini arttırmada etkili bir yöntemdir. Kalıp değişimini etkileyen faktörlerin istatistiksel olarak analiz edilmesinde Taguchi metoduna başvurulabilmektedir. Bu çalışmada plastik sektöründe yalın üretim araçlarından biri olan SMED metodu ele alınmıştır. Kalıp değişimini etkileyen faktörleri analiz etmek amacıyla SMED çalışması ile Taguchi metodundan yararlanılmıştır. Yapılan iyileştirmeler sonucunda 28 dakikalık bir kazanç elde edilmiştir. Yapılan bu çalışma SMED uygulamasında faktör etkilerinin dikkate alınmasının önemini vurgulamaktadır ve plastik sektörü için önemli bir örnek teşkil etmektedir.

Anahtar kelimeler: SMED, Taguchi Yöntemi, SMED-Taguchi, Plastik Sektörü.

ABSTRACT

In today's business environment, companies operate under intense competitive conditions. The competition requires the development and improvement of businesses. Until today, businesses have tried to sustain their existence by utilizing various methods and conducting improvement efforts. Lean production helps businesses achieve the most efficient production or service with minimum resources and correct, qualified, standardized work steps. Lean production has various sub-disciplines and can be used in improvement efforts. SMED (Single-Minute Exchange of Die), one of the methods used to reduce time losses, has been attracting increasing interest from businesses. The SMED method refers to the single-digit minute changeover of tools or dies, and its primary objective is to reduce setup time to less than 10 minutes. This method is essential for enhancing production speed and efficiency by reducing

time losses in mass production. Many reasons can cause time losses in processes. The time lost during equipment changeovers is of significant importance. Taguchi method, one of the experimental design methods, is a practical approach to improving product or process quality. Taguchi method can be utilized for statistically analyzing the factors influencing equipment changeovers. This study considers the SMED method, one of the lean production tools, in the plastic industry. The SMED method was used with the Taguchi method to analyze the factors affecting equipment changeovers. As a result of the improvements, a gain of 28 minutes has been achieved. This study highlights the importance of considering factor effects in SMED implementation and is an important example for the plastic industry.

Keywords: SMED, Taguchi Method, SMED-Taguchi, Plastic Industry.

INVESTIGATING THE EFFECTIVENESS OF CRUMB RUBBER AND RICE HUSK ASH IN SUBGRADE SOIL STABILIZATION

Sikander KHAN

University of Wah, Wah Engineering College, Civil Engineering Department, Taxila, Pakistan

ORCID ID: 0009-0002-7214-7426

Amir Nawaz KHAN

University of Engineering and Technology Taxila, Faculty of Civil Engineering, Transporation Engineering Department, Taxila, Pakistan

ORCID ID: 0000-0001-5625-6943

ABSTRACT

In this study, rice husk ash and discarded tire crumb rubber, readily accessible waste materials are investigated as a sustainable and cost-effective way to stabilize subgrade soil. Various proportions of rubber crumbs and rice husk ash were added to the virgin soil by weight separately: 5%, 10%, and 15%. In terms of performance parameters, CBR & FSI were evaluated using a CBR testing machine & FSI apparatus respectively. Compaction tests for OMC & MDD were conducted using standard proctor apparatus. Samples were prepared and tested for liquid limit and plastic limit using Casagrande's apparatus. The study concluded that the CBR & FSI increased and decreased respectively at different proportions of stabilizers. In addition, the liquid limit and plastic limit of the soil decrease as the concentration increases up to 10% and then increases onward. The decrease in liquid limit and plastic limit can be attributed to removing the fine particles. With the addition of 15% rice husk ash (RHA), the soil's CBR value increased from 3.56% to 7.08%, significantly higher than that of virgin soil. A decrease in the swelling characteristics of soil was observed with an increase in rice husk ash (RHA) and crumb rubber (CRP) concentration. The maximum reduction in soil swelling was observed at 15% for both RHA and CRP. Notably, the swelling was significantly reduced from 52% to 34.69%, specifically when 15% RHA was added to the soil. The significant reduction in soil swelling and the improved bearing capacity observed with the incorporation of RHA and CRP indicate that this approach can be considered a favorable option for effectively stabilizing the subgrade soil.

Keywords: Rice Hus Ash, Crumb Rubber, Subgrade, CBR, Stabilization, Soil

AKILLI BAĞLANTILI ARAÇLAR İÇİN YEŞİL IŞIK OPTİMUM HIZ DANIŞMANLIĞI (GLOSA) SİSTEMİ

GREEN LIGHT OPTIMAL SPEED ADVISORY (GLOSA) SYSTEM FOR INTELLIGENT CONNECTED VEHICLES

Şahap Okan KISA

Süleyman Demirel Üniversitesi, Mühendislik Fakültesi, Elektrik Elektronik Mühendisliği Bölümü, Isparta, Türkiye

ORCID ID: 0000-0003-3828-606X

Esin YAVUZ

Dr. Öğr. Üyesi, Süleyman Demirel Üniversitesi, Mühendislik Fakültesi, Elektrik Elektronik Mühendisliği Bölümü, Isparta, Türkiye

ORCID ID: 0000-0002-8077-5353

ÖZET

Sinyalizasyon sistemleri; yakıt tüketimini, gaz emisyonlarını ve seyahat süresini etkilemede önemli bir rol oynamaktadır. Akıllı Ulaşım Sistemleri (Intelligent Transport Systems), trafik yoğunluğunun her geçen gün daha da arttığı günümüzde, bu faktörlerin çevre ve sürücülerin konforu üzerindeki etkisini azaltmak için önerilmektedir. Kooperatif Akıllı Ulaşım Sistemleri (Cooperative Intelligent Transport Systems), iki veya daha fazla akıllı ulaşım sistemine ait alt bileşenlerin (yaya, araç, yol kenarı ve merkezi) arasındaki iş birliğini daha iyi kalitede ve daha gelişmiş bir hizmet seviyesi ile sunan akıllı ulaşım sistemleri hizmetlerini mümkün kılar. Araçların trafikte sürücüden bağımsız bir şekilde veri toplayıp, bu verileri analiz etmesi, bu kapsamda yapılan çalışmaların temelini oluşturmaktadır. Araçtan araca (V2V) ve araçtan altyapıya (V2I) iletişim, yalnızca otonom araçlara doğru ilerlemeyi hızlandırma potansiyeline sahip olmakla kalmaz, aynı zamanda daha uygun sürücü davranış kalıplarının elde edilmesini kolaylaştırma ve böylece trafiği daha verimli ve çevresel hale getirme potansiyeline sahiptir. Bu çalışma, trafik koşullarını iyileştirmek için trafik ortamlarında bir Araçların İnterneti (IOV) çözümü olarak uygulanabilecek Yeşil Işık Optimum Hız Danışmanlığı (GLOSA) sisteminin kullanımına dayanan ve trafik akış özellikleri üzerindeki etkisini değerlendiren, trafik ışıklarına yaklaşan araçlar için bir sürüş tavsiye sistemi sunar. GLOSA; yakıt tüketimini, kavşaklardan geçerken bekleme süresini, havaya salınan karbonmonoksit gazını ve kavşaklarda meydana gelen kaza sayısını azaltabilen trafik verimliliği hizmetlerinden biridir. Trafik ışığı ile araç arasında haberleşmenin kurulduğu bu sistemde, trafik ışığının yeşil yandığı süre aralığında kavşağa ulaşmak için sürücüye tavsiye edilen bir optimum hız konusunda araçlar bilgilendirilir. Bu optimum hızla araçlar, istikametinde bulunan trafik ışıklarındaki yeşil ışığın yandığı zaman diliminde durmadan kavşaktan geçebilir. Çalışmada, sistem performansının değerlendirilmesi için güncel veriler ışığında trafik simülasyonları incelenmiştir. Trafik simülasyonları için açık kaynak kodlu SUMO (Simulation of Urban Mobility) yazılımı kullanılmıştır.

Anahtar kelimeler: Yeşil Işık Optimum Hız Danışmanlığı, GLOSA, Akıllı Ulaşım Sistemleri, Sinyalizasyon.

ABSTRACT

Signaling systems play an important role in influencing fuel consumption, gas emissions and travel time. Intelligent Transportation Systems (ITS) are recommended to reduce the impact of these factors on the environment and the comfort of drivers, as the traffic density is increasing day by day. Cooperative Intelligent Transport Systems (C-ITS) enable intelligent transportation systems services that present cooperation between two or more intelligent transportation systems sub-components (pedestrian, vehicle, roadside and central) with better quality and a more advanced service level. The fact that

vehicles collect and analyze data independently of the driver in traffic forms the basis of the studies carried out in this context. Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication not only has the potential to accelerate progress towards autonomous vehicles, but also has potential to facilitate the acquisition of more appropriate driver behavior patterns and thereby making traffic more efficient and environmental. This study presents a driving advisory system for vehicles approaching traffic lights, based on the use of a Green Light Optimum Speed Advisor (GLOSA) system that can be implemented as an Internet of Vehicles (IOV) solution in traffic environments to improve traffic conditions and evaluate its impact on traffic flow characteristics. GLOSA is one of the traffic efficiency services that can reduce fuel consumption, waiting time when passing through intersections, carbon monoxide gas released into the air and the number of accidents that occur at intersections. In this system, where communication is established between the traffic light and the vehicle, vehicles are informed about a recommended optimum speed to reach the intersection during the period when the traffic light is green. With this optimum speed, vehicles pass through the intersection without stopping during the time when the green light on the traffic lights in their direction is on. In the study, traffic simulations were examined in the light of current data to evaluate the system performance. Open source software SUMO (Simulation of Urban Mobility) was used for traffic simulations.

Keywords: Green Light Optimum Speed Advisor, GLOSA, Intelligent Transportation Systems, Signalization.

DİNAMİK ORTAMDA ÇALIŞAN ÇOKLU MOBİL ROBOTLAR İÇİN GÖRÜNTÜ İŞLEME TABANLI GEZİNME VE KONUMLANDIRMA

IMAGE-BASED NAVIGATION AND LOCALIZATION FOR MOBILE MULTI-ROBOTS IN DYNAMIC ENVIRONMENT

Serkan PINAR

Instructor, Ege University, Ege Higher Vocational School, Department of Electronics and Automation, İzmir, Türkiye

ORCID ID: 0000-0001-8601-3248

Dilşad ENGİN

Asst.Prof. Dr., Ege University, Ege Higher Vocational School, Department of Electronics and Automation, İzmir, Türkiye

ORCID ID: 0000-0003-0159-275X

ÖZET

Otonom mobil robotlar depolar, hastaneler ve dış ortamlar gibi koşulların sürekli değiştiği dinamik ortamlarda giderek daha fazla kullanılmaktadır. Bu koşullarda etkin çalışabilmek için robotların algılama, konum belirleme, planlama ve karar verme gibi çeşitli yeteneklerle donatılması gerekmektedir. Dinamik ortamlar için otonom mobil robotların geliştirilmesindeki en önemli zorluklardan biri lokalizasyon ve sağlam algılama yetenekleri sağlamaktır. Lokalizasyon, mobil otonom robotlar özelinde planlama, navigasyon ve görevlerin yürütülmesi için önemli bir konudur. Bu ortamlarda robotların çevrelerindeki engeller, dinamik nesneler ve yapılandırılmamış ortamlar gibi değişikliklerle başa çıkmaları gerekir. Bu çalışmada, iki adet FESTO firmasının Robotino mobil robotu, durağan ve dinamik ortamlarda kendi aralarındaki iş yoğunluğunu koordine ederek iş istasyonlarında verilen görevleri yapabilmesi için geliştirilen algoritma ile programlanmış, otonom mobil robot uygulamaları simülasyon ve deney ortamında yapılmıştır. Robotino üzerindeki sekiz adet kızılötesi sensörlerden alınan analog sinyal bilgisi ile cisme ne kadar yaklaştığı belirlenmiştir. Enkoderden gelen tekerlerin dönüş bilgileri odometri bloğu ile ölçülmüştür. İvmeölçerler, robotun hızını ve ivmesini ölçerken jiroskoplar, robotun dönme hareketlerini algılar. Bu sensörler, robotun konumunu ve hareketini belirlemesine yardımcı olur. Hat izleme için, Robotino robotta mevcut olan çizgi izleme sensörleri ve kızılötesi sensörler kullanılmıştır. Çok sayıdaki iş istasyonu arasındaki gezinmede robot yerleştirmesi için hedefler renkli etiketler ile etiketlenmiş ve iş istasyonlarının konumları robot üzerindeki RGB kamera ile Robotino View program arayüzündeki renk aralığı bulucu bloğu kullanılarak renk tabanlı görüntü işleme sağlanmıştır. İki Robotino arasındaki haberleşme de ESP32 mikrodenetleyicinin dahili Wi-Fi modülü ile gerçeklenerek atanan görevlerin sistemin başarımını artıracak şekilde sağlanmıştır. Önceki çalışmalar incelendiğinde odometriden alınan konum bilgilerinin lokalizasyonda problemlere neden olduğu görülmüş, bu problemi ortadan kaldırmak için çeşitli yöntemler kullanılmıştır. Laboratuvar ortamında, Robotino mobil robotun ileri ve geri hareketleri 500mm ve 1000mm mesafelerinde sadece ileri geri hareketleri gözlemlenirken x, y konumları ve phi (°) açısındaki değişimleri incelenmiştir. Robotino mobil robot için geliştirilen algoritma Robotino View simülasyon ortamında sorunsuz çalışmıştır. Ancak deneysel çalışmalar sonucunda mobil robotun tanımlanan koordinatlara gidip geri döndüğü noktalarda kaçıklık değerleri ölçülmüştür. Odometri bloğu pozisyon bilgisi kullanılarak 500mm mesafelerde x ekseninde en fazla ±%0.3, 1000mm mesafelerde en fazla ±%0.2 kaçıklık hatası oluştuğu belirlenmiştir. Kaçıklık değerleri y ekseninde, sırasıyla ±1.8mm ve ±0.2mm olmuştur. Bu sorunu ortadan kaldırmak için Robotino üzerindeki sensörlerden ve odometriden alınan verileri kullanarak Kalman filtresi ile veriler optimize edilecektir. Kaçıklık oranları en aza indirilerek Robotino robotun istenilen noktaya gitmesinin sağlanması için görüntü işleme veya hat izleme ile gidilen koordinatı sürekli iyileştirmek çalışmanın ilerideki hedefidir.

Anahtar kelimeler: mobil robot, navigasyon, konumlandırma, görüntü işleme, çoklu otonom robotlar, dinamik ortamda navigasyon ve konumlandırma

ABSTRACT

Autonomous mobile robots are increasingly used in dynamic environments where conditions are constantly changing, such as warehouses, hospitals and outdoor environments. In order to work effectively in these conditions, robots must be equipped with various abilities such as sensing, localization, planning and decision making. One of the major challenges in the development of autonomous mobile robots for dynamic environments is to provide localization and robust sensing capabilities. Localization is an important issue for planning, navigation and execution of tasks in mobile autonomous robots. In these environments, robots have to cope with changes in their environment such as obstacles, dynamic objects, and unstructured environments. In this study, autonomous mobile robot application of two FESTO Robotino, programmed with the algorithm developed to coordinate the workload among themselves in static and dynamic environments and to perform the tasks given at the workstations, were carried out in simulation and experimental environment. With the analog signal information received from the eight embedded infrared sensors on the Robotino, it was determined how close it was to the object. The rotation information of the wheels coming from the encoder was measured with the odometry block. Accelerometers measure the robot's speed and acceleration, while gyroscopes detect the robot's rotational movements. These sensors help the robot determine its position and movement. For line tracking, line tracking sensors and infrared sensors available in the Robotino robot were used. In navigation between multiple workstations, targets are labeled with colored labels for robot placement, and the positions of workstations are provided with color-based image processing using the RGB camera on the robot and the color range finder block in the Robotino View program interface. The communication between the two Robotinos is also provided by the internal Wi-Fi module of the ESP32 microcontroller, increasing the performance of the assigned tasks. When previous studies were examined, it was seen that the location information obtained from odometry caused problems in localization, and various methods were used to eliminate this problem. In the laboratory environment, forward and backward movements of the Robotino mobile robot were observed at 500mm and 1000mm distances, while the changes in x, y positions and phi (°) angle were examined. The algorithm developed for the Robotino mobile robot worked smoothly in the Robotino View simulation environment. However, as a result of experimental studies, misalignment values were measured at the points where the mobile robot went to the defined coordinates and returned. Using the position information of the odometry block, it was determined that at 500mm distances, maximum ±0.3% offset error occurred in the x-axis, and at 1000mm distances, ±0.2% misalignment error occurred at most. The offset values in the y-axis were ±1.8mm and ±0.2mm, respectively. To eliminate this problem, the data will be optimized with the Kalman filter using data from sensors and odometry on the Robotino. The future goal of the study is to continuously improve the coordinates reached by image processing or line tracking in order to ensure that the Robotino robot goes to the desired point by minimizing the misalignment.

Keywords: mobile robot, navigation, localization, image processing, multiple autonomous robots, navigation and localization in dynamic environment

CONTENT ANALYSIS OF E-MENTORING APPLICATIONS IN HIGHER EDUCATION

Deniz GÜNAY

Res. Assist. Dr., Ege U., Faculty of Fisheries, Dep. Of Aquaculture, İzmir, Türkiye

ORCID ID: 0000-0003-0069-4703

Huriye GÖNCÜOĞLU BODUR

Lect. Dr., Ege U., Faculty of Fisheries, Dep.of Fishing Tech. and Seafood Process.Tech., İzmir, Türkiye

ORCID ID: 0000-0001-7068-037X

ABSTRACT

In the new century, where humanist values and digitalization have gained more importance, one of the biggest goals of e-mentoring is to raise people with higher awareness and more respect for the environment and living things. Through e-mentoring, a technology-based application, it's possible to achieve several goals such as higher number of students, decreased costs, equal social status and less demographical stress and interactions can be recorded. Through use of information and communication technologies, the classical understanding of mentoring has changed and the concept of electronic mentoring (e-mentoring) has emerged. The purpose of this study is to examine the scientific publications in national and international literature on e-monitoring research in higher education, focusing on the applicability of e-mentoring to the education of fisheries engineering. The study employs content analysis which is an in-depth analyses of related academic publications according to certain criteria; throgh which the data are examined in detail and the publications are summarised to contribute to the literature. In this study, a total of 25 national and international articles in the related databases of Google Academics and Web of Science between 2013 and 2023 were scanned and the methods, publication dates, sample distributions and results thereof were presented. The application of technology based e-mentoring applications in the programs of the fisheries faculties will contribute to the academic and vocational development of students. Furthermore, the findings will support the usability and utility of the e-mentoring intervention based on a conceptual framework that characterized an electronic support process for fisheries faculty students.

Keywords: Higher education, e-mentoring, fisheries, technology-based education.

TWİTTER VERİLERİ İLE DOĞAL DİL İŞLEME: BERT İLE DUYGU ANALİZİ

NATURAL LANGUAGE PROCESSİNG VIA TWITTER DATA: SENTIMENT ANALYSIS WITH BERT

Taner SEKMEN

Ege Üniversitesi, Fen fakültesi, İstatistik Bölümü, İzmir, Türkiye

ORCID ID: 0009-0001-0044-3325

Atakan BARIŞ

Ege Üniversitesi, Fen fakültesi, İstatistik Bölümü, İzmir, Türkiye

ORCID ID: 0000-0000-0000-0000

Büşra SAYIN

Ege Üniversitesi, Fen fakültesi, İstatistik Bölümü, İzmir, Türkiye

ORCID ID: 0009-0008-8899-3524

Elif KOZAN

Ege Üniversitesi, Fen fakültesi, İstatistik Bölümü, İzmir, Türkiye

ORCID ID: 0000-0002-8267-074X

ÖZET

Doğal Dil İşleme (Natural Language Processing-NLP), son yıllarda hızla gelişerek birçok alanda kullanılmaya başlamıştır. NLP, insan dilinin bilgisayar tarafından anlaşılması ve işlenmesi ile ilgili bir disiplindir. İnsanların iletişim kurmak için kullandığı dilin, karmaşık ve çok katmanlı bir yapıya sahip olması, bu dilin otomatik olarak işlenmesini oldukça zorlaştırmaktadır. NLP, dil işleme konusunda ortaya çıkan bu zorluklara çözüm arayan ve insan dilinin anlaşılması, işlenmesi ve kullanımı için bilgisayar sistemleri geliştiren bir alandır. Doğal dil işlemenin alanlarından biri olan duygu analizi insanların belli olaylar, kişiler, markalar gibi durumlara sosyal medyada yaptıkları yorumların analizinde kullanılabilmektedir. Sosyal medya platformlarında birçok olay hakkında kullanıcılar fikirlerini özgürce ifade edebilmektedir. Bu olaylar hakkında toplumun fikrini alma açısıdan verilerin incelenmesi önemlidir. Bundan dolayı günümüzde duygu analizi çalışmaları önem kazanmaktadır. Yapılan yorumları duygu analizi kullanarak pozitif (olumlu), nötr (tarafsız) ve negatif (olumsuz) olarak sınıflandırmak mümkündür. Bu çalışmada, üniversitelerin online /uzaktan eğitime geçmesiyle Twitter üzerinde yapılan yorumlar duygu analizi kullanılarak incelenecektir. Çalışmamızda metinlerin sayısal verilere dönüşümü kullanılarak insanların belli bir konuda negatif mi pozitif mi düşündükleri üzerine modelleme yapılmıştır. Twitter API'ı üzerinden toplanan tweetler Python programlama dili kullanılarak doğal dil işleme yöntemleri yardımıyla skorlanmıştır. Skorlama sonucu ilgili tweetin Negatif (-1) ve Pozitif (1) düşünce içerdiğine bağlı olarak etiketlenmiştir. Online eğitimin avantaj ve dezavantajlarını analiz etmek amacıyla yapılmış pek çok makine öğrenmesi çalışması bulunmaktadır (Remali vd., 2022; Yurtsever vd., 2021; Özyurt ve Kısa, 2021) Bu çalışmalarda duygu analizi için birçok farklı yöntem ve model kullanıldığı görülmektedir. Bizim çalışmamızda, duygu analizi için nöral ağ temeline dayanan BERT modeli kullanılmıştır. BERT modeli ile ilgili çalışma Türkçe dilinde oldukça azdır. BERT (Bidirectional Encoder Representations from Transformers) modelleri yapısal olarak kullanılan kelimeler arasında çift taraflı model eğitimine imkân sağlanan derin öğrenme modelleridir. Çalışmanın sonucunda Tweetlerin hangi duygu ağırlıkta olduğunu belirlemek için yapılan BERT temelli duygu analizinde modelin doğruluk oranı ölçülmüştür. Online eğitime ilişkin yapılan yorumlara dair kurmuş olduğumuz modelde, metine dair; olumlu tweetlerin olumlu olarak tahminlenmesine ilişkin f1 skoru 0.73, olumsuz tweetlerin olumsuz olarak tahminlenmesi f1 skoru 0.87 olarak ölçülmüştür.

Anahtar kelimeler: Doğal dil işleme, Makine öğrenmesi, Duygu analizi, BERT, Derin öğrenme, Twitter.

ABSTRACT

Natural Language Processing (NLP) has rapidly developed in recent years and has been widely used in various fields. NLP is a discipline that deals with the understanding and processing of human language by computers. The complex and multi-layered structure of the language used by humans makes it challenging to automatically process it. NLP is an area that seeks solutions to the difficulties encountered in language processing and develops computer systems for understanding, processing, and utilizing human language. Sentiment analysis, which is one of the areas of NLP, can be used to analyze user comments on social media regarding specific events, individuals, brands, and other situations. Social media platforms allow users to freely express their opinions about various events. Analyzing the data related to these events is important for capturing public sentiment. Therefore, sentiment analysis studies have gained importance in today's world. It is possible to classify comments made by individuals as positive, neutral, or negative using sentiment analysis. In this study, we will analyze the comments made on Twitter regarding the transition of universities to online education using sentiment analysis. NLP methods convert texts into mathematical data and enable various analyses. Modeling was done based on whether people think negatively or positively about a particular subject using this data transformation. Tweets collected via the Twitter API were scored using natural language processing methods in Python. Based on the scoring results, tweets were labeled as Negative (-1) or Positive (1) depending on the thoughts expressed. There are many machine learning studies conducted to analyze the advantages and disadvantages of online education (Remali et al., 2022; Yurtsever et al., 2021; Özyurt and Kısa, 2021). These studies use various methods and models for sentiment analysis. In our study, we used the BERT model, which is based on neural networks, for sentiment analysis. There are very few studies on BERT model in the Turkish language. BERT (Bidirectional Encoder Representations from Transformers) models are deep learning models that allow bidirectional model training among the used words structurally. In the model we developed for comments related to online education, the f1 score for correctly predicting positive tweets as positive was measured as 0.73, and the f1 score for correctly predicting negative tweets as negative was measured as 0.87.

Keywords: Natural language processing, Machine learning, Sentiment analysis, BERT, Deep learning, Twitter.

BULUD TEXNOLOGİYALARINDA TƏHLÜKƏSİZLİK MƏSƏLƏLƏRİ

SECURITY ISSUES IN CLOUD TECHNOLOGIES

Raqsana HAMİDOVA

Baku Engineering University

ÖZET

Bulud texnologiyaları günümüzdə böyük müəssisələrdən tutmuş kiçik müəssisələrə qədər tətbiq edilməyə başlamışdır.Bulud texnologiyaları məlumatların müəssisə daxilində sərt disklərdə saxlanılmasından daha təhlükəsizdir.Təbiət hadisəsi,oğurluq və s kimi bir çox hallarda məlumat itkisi baş verə bilər.Ancaq bulud texnologiyasının tətbiqi bu kimi problemlərin bir çoxunu həll etdir.Bulud texnologiyalarının bir çox üstünlüyü olsa da , onların da bir çox təhlükəsizlik məsələləri vardır.Bulud texnologiyaları günümüzdə də istər istifadəçi interfeysi,istər təhlükəsliyi cəhətdən inkişaf etdirilir.Bulud texnologiyalarının təhlükəsizliyini təmin etmək üçün bir çox təhlükəsizlik qrupları müəssisənin həcminə əsasən ayrılıqda və ya bircə işləyit.Bu qruplar böyük müəssisələrdə ayrıca qruplar kimi işləyir.Çünki hər bir təhlükəsizlik məsələsi ayrıca böyük məsələdir.Bulud texnologiyaları gün keçdikcə daha çox inkişaf edir və bununla bərabər ondan istifadə edən müəssisələrin də böyüməsinə şərait yaradır.

Açar sözlər: bulud texnologiyası, kompüter, informasiya, təhlükəsizlik, proqram, şəbəkə, standart.

ABSTRACT

Today, cloud technologies have started to be applied from large enterprises to small enterprises. Cloud technologies are more secure than storing data on hard drives inside the enterprise. Data loss can occur in many cases such as natural events, theft, etc. However, the application of cloud technology can solve many of these problems. Although cloud technologies have many advantages, they also have many security issues. Cloud technologies are being developed today, both in terms of user interface and security. In order to ensure the security of cloud technologies, many security groups work separately or in one place depending on the size of the enterprise. .These groups work as separate groups in large enterprises. Because each security issue is a separate big issue. Cloud technologies are developing day by day, and at the same time, they are enabling the growth of businesses that use it.

Keywords: cloud technology, computer, information, security, software, network, standard.

SPATIO-TEMPORAL ANALYSIS OF LANDSCAPE DYNAMICS: THE CASE OF SELCUK, IZMIR, TURKIYE

Kübra KURTŞAN

PhD Candidate, Ege University, Natural and Applied Sciences, Division of Landscape Architecture, Izmir, Türkiye

ORCID ID: 0000-0003-1212-3369

Can SAYGINER

Asst. Prof., Izmir Democracy University, Faculty of Economics and Administrative Sciences, Department of Management Information Systems, Izmir, Türkiye

ORCID ID: 0000-0002-1680-392X

Diba ŞENAY

Res. Asst., Ege University, Faculty of Agriculture, Department of Landscape Architecture, Izmir, Türkiye

ORCID ID: 0000-0003-3008-9408

Engin NURLU

Prof. Dr., Ege University, Faculty of Agriculture, Department of Landscape Architecture, Izmir, Türkiye

ORCID ID: 0000-0001-5458-7749

ABSTRACT

The change in land use/land cover (LU/LC) serves as a significant indicator in detecting and undertanding landscape transformations due to its influence on the complex and dynamic processes within natural and social systems at a global scale. Consequently, there is a need to describe and quantify landscape characteristics in order to effectively analyze landscape dynamics. In this context, the aim of this study is to spatio-temporal analysis of landscape dynamics between the years of 1990-2020 in Izmir province of Selcuk district using landscape metrics. The study used Landsat 5 TM of 1990 and Landsat 8 OLI of 2020 satellite images for the delineation of land use/land cover (LU/LC) maps. LU/LC maps, including six LU/LC types- *forest land, cropland, grassland, wetlands, settlements and other land*, were created using pixel-based classification and screen digitization methods. In order to analyze spatio-temporal changes in landscape dynamics, *"landscapemetrics"*, R package was used to calculate landscape metrics for categorical landscape patterns of the study area. A total of eight landscape metrics; Class Area (CA), Percentage of Landscape (PLAND), Number of Patches (NP), Mean Patch Area (AREA_MN), Edge Density (ED), Largest patch index (LPI), Effective Mesh Size (MESH), and Mean Euclidean Nearest Neighbor Distance (ENN_MN) were used. It is observed that the changes predominantly occur in natural and semi-natural areas and has been found that these changes are primarily influenced by increased agricultural activities, leading to transitions towards croplands. The study contributes to future land management and planning efforts by providing insights into the dynamics of land use/land cover changes in the Selcuk district of Izmir province by informing sustainable land use practices and conservation strategies for the region in the coming years.

Keywords: Landscape metrics, land use/land cover, spatio-temporal analysis, *landscapemetrics package*, R software

EFFECT OF CLAY CONCENTRATION ON MORPHOLOGY AND PROPERTIES OF POLY (VINYL ALCOHOL) FILMS

Imane ABBOU

Laboratoire de Recherche Toxicomed, Université Abou Baker Belkaid, BP119, 13000 Tlemcen, Algérie

Abdelmajid BELKHODJA

Laboratoire de Recherche Toxicomed, Université Abou Baker Belkaid, BP119, 13000 Tlemcen, Algérie

Souhila GUENDOUZ

Laboratoire de Recherche Toxicomed, Université Abou Baker Belkaid, BP119, 13000 Tlemcen, Algérie

Amal BENKHALED

Laboratoire de Recherche Toxicomed, Université Abou Baker Belkaid, BP119, 13000 Tlemcen, Algérie

Fatima El BERRICHI

Laboratoire de Recherche Toxicomed, Université Abou Baker Belkaid, BP119, 13000 Tlemcen, Algérie

Esma CHOUKCHOU-BRAHAM

Laboratoire de Chimie Physique, Université de 8mai45, BP 401, Guelma, Algérie

ABSTRACT

The aim of this work is to investigate the role of Djebel Debagh Guelma kaolin clay (DD3) as a filler for designing new films polyvinyl alcohol (PVA/DD3).The films, containing different ratios of DD3 (1, 2 and 3 wt.%), were prepared using the solvent casting method. Interactions between PVA polymer and DD3 clay were determined by Fourier transform infrared spectroscopy, and the surface morphology of the films was examined by optical microscopy. A dynamic mechanical analyzer was used to measure the thermal and dynamic mechanical properties of the PVA/DD3 blend films. All materials analyzed show a typical decrease in loss modulus, which is attributed to the glass transition of the polymer matrix. The results showed that chemical and physical interactions between the polymer matrix and functional groups on the DD3 surface have a considerable impact on the final properties of the materials.

Keywords: DD3; Poly (vinyl alcohol); Films; Dynamic mechanical properties.

OBTAINING USER-SPECIFIC INFORMATION FROM THE INTERNET VIA TEXT MINING AND MOBILE BASED SYSTEM

Imran GUL

Suleyman Demirel University Computer Engineering Department, Isparta, Türkiye

Kafkas University, Faculty of Economics and Administrative Sciences, Kars, Türkiye

ORCID ID: 0000-0003-3873-8708

Ferdi SARAC

Suleyman Demirel University Computer Engineering Department, Isparta, Türkiye

ORCID ID: 0000-0002-7080-1634

ABSTRACT

Recently, the Internet has been used as a primary source of information thanks to ever-growing data. Even though huge amount of data is available online, gathering required information from the Internet is quite difficult. The data on the Internet is very large and complex; therefore, the information requested from this large data must be parsed and transformed to the end users. In order to achieve this, a novel text mining and mobile-based system is developed to allow the end users to access the information they needed. By exploiting data collection tools, the data is continuously gathered over the Internet and transferred to our own unique database. Next, the data is constantly updated and preprocessed before its transmitted to the end user. Then, through the developed mobile application, user-specific data is transmitted to the end user. The proposed system enables end users to access user-specific information of the products. Via the mobile application, users are provided with usable and user-specific information from many different perspectives such as health and economy. This proposed system is unique because to the best of our knowledge there is no such tool that provides user-specific information to the end users. We hope that the proposed system will be useful for end users to reach the accurate and user-required information that is not provided on the products.

Keywords: Text Mining, Statistical Pattern Recognition, Text Processing.

LANTHANUM-MODIFIED BIOCHAR EFFICIENCY TOWARD PHOSPHORUS

Nail AMARA

Research Laboratory in Subterranean and Surface Hydraulics, University of Biskra, PO Box 145, Biskra, 07000, Algeria

Abdelkader OUAKOUAK

Hydraulic and Civil Engineering Department, University of El Oued, PO Box 789, El Oued, 39000, Algeria

Asma NOUIOUA

Research Laboratory in Subterranean and Surface Hydraulics, University of Biskra, PO Box 145, Biskra, 07000, Algeria

Dhirar Ben SALEM

Research Laboratory in Subterranean and Surface Hydraulics, University of Biskra, PO Box 145, Biskra, 07000, Algeria

ABSTRACT

Recently, eutrophication has become one of the major environmental concerns over the world; this is why the minimization and the elimination of phosphate from water resources has become a critical challenge.

Over the many methods for removing P from waters, adsorption is considered as a feasible, inexpensive, fast removal rate and efficient one. This is we it is considered as an attractive approach due to those advantages.

In our study, we were prepared date palm biochar (DPB) and modified it with lanthanum. Then, batch sorption experiments were conducted in order to determine its sorption efficiency toward phosphorus. The DPB was preapared by a single-step pyrolysis process at 700°C.

We had studied a primary test with initial P concentration of 5 to 100 mg/l, also a stirring time effect test (0 to 240min), and result were discussed herein.

Results showed that the non-modified biochar (DPB) had poor adsorption efficiency toward P, which is not the case for the Lanthanum modified biochar (L-DPB) who had excellent adsorption efficiency. Added to that, we found that there is a correlation relationship between qe and the stirring time. So, while this later was increasing, the efficiency of P was gradually increasing too.

Keywords: Biochar, Lanthanum, Phosphorous, Stirring time.

SU ÜRÜNLERİ YETİŞTİRİCİLİĞİNDE FİTOJENİKLERİN KULLANIM POTANSİYELİ

THE POTENTIAL FOR USING PHYTOGENICS IN AQUACULTURE

Ebru YILMAZ

Doç. Dr., Aydın Adnan Menderes Üniversitesi, Ziraat Fakültesi, Su Ürünleri Mühendisliği Bölümü, Aydın, Türkiye

ORCID ID: 0000-0003-1905-1265

ÖZET

Su ürünleri sektörü Birleşmiş Milletler Gıda ve Tarım Örgütü (FAO) tarafından tüm gıda sektörleri içerisinde hızlı gelişen ve sürekli büyüyen bir sektör olarak lanse edilmektedir. Türkiye'de de benzer bir durum söz konusudur. Dünya Sağlık Örgütü, hayvan yemlerinde büyüme destekleyici olarak her türlü hormon ve hormon benzeri maddeler ile antibiyotiklerin kullanımını yasaklamıştır. Bu nedenle araştırıcılar, son yıllarda büyüme destekleyici olarak kullanılabilecek doğal ve güvenli maddeleri araştırmaya başlamışlardır. Fitojenikler, enzimler, probiyotikler, prebiyotikler, mineraller, organik asitler, anti-mikrobiyal peptidler ve vitaminler büyüme performansı artırıcı özellikleri ile ön plana çıkmaktadır. Fitojenik yem katkı maddeleri, bitki kaynaklı materyallere dayanmaktadır. Fitojenik yem katkı maddelerinin aktif madde içeriği, kullanılan bitki ve bitkinin botanik bölümüne (tohumlar, yaprak, kök veya kabuk), hasat zamanına ve coğrafik orijinine bağlı olarak çok değişken olabilmektedir. Fitojenik yem katkı maddeleri arasında otlar, baharatlar, uçucu yağlar ve oleoresinler bulunur. Fitojenik yem katkı maddelerinin, antimikrobiyal, antiviral, antioksidatif ve antienflamasyon etkileri ile yemin lezzetini artıran ve bağırsak sağlığını geliştiren çeşitli işlevlere sahip olduğu bilinmektedir. Ayrıca, fitojenik yem katkı maddelerinin, yem tüketimi ve endojen salgılamayı uyardığı ve üretimi artırdığı da bildirilmiştir. Bununla beraber, fitojenik yem katkı maddeleri çevre için bir tehdit oluşturmazlar. Bu derlemede, fitojeniklerin su ürünlerinde kullanım potansiyeli ortaya konmuştur.

Anahtar kelimeler: büyüme performansı, fitojenik, su ürünleri

ABSTRACT

The aquaculture sector is introduced by the Food and Agriculture Organization of the United Nations (FAO) as a rapidly developing and constantly growing sector among all food sectors. There is a similar situation in Turkey, too. The World Health Organization prohibits the use of all kinds of hormones, substances and antibiotics as growth promoters in animal feeds. For this reason, researchers have started to search for natural and safe substances that can be used as growth promoters in recent years. Phytogenics, enzymes, probiotics, prebiotics, minerals, organic acids, anti-microbial peptides and vitamins come to the fore with their characteristics that enhance growth performance. Phytogenic feed additives are based on plant-derived materials. The active ingredient content of phytogenic feed additives can be very variable depending on the plant used and the botanical part of the plant (seeds, leaf, root or bark), harvest time and geographical origin. Phytogenic feed additives include herbs, spices, essential oils and oleoresins. It is known that phytogenic feed additives have various functions that increase the flavor of the feed and improve intestinal health with their antimicrobial, antiviral, antioxidative and anti-inflammatory effects. It is also reported that phytogenic feed additives stimulate feed consumption and endogenous secretion as well as increase production. At the same time, phytogenic feed additives are not a threat to the environment. In this review, the potential for use of phytogenics in aquaculture is analysed.

Keywords: growth performance, phytogenic, aquaculture

HİZMET DÜZEYİ SÖZLEŞMELERİNİN YÖNETİMİNDE MAKİNE ÖĞRENMESİ VE DERİN ÖĞRENME İLE ÇALIŞAN TAHMİNLEME VE ÖNERİ PLATFORMU

PREDICTION AND RECOMMENDATION PLATFORM BASED ON MACHINE LEARNING AND DEEP LEARNING FOR MANAGEMENT OF SERVICE LEVEL AGREEMENTS (SLA)

Yavuz ŞAHİN

Experilabs (SahaBT Yazılım), İstanbul, Türkiye

ORCID ID: 0009-0000-1913-8737

Mehmet Hakkı ERSOY

Experilabs (SahaBT Yazılım), İstanbul, Türkiye

Senem ŞAHAN VAHAPLAR

Experilabs (SahaBT Yazılım), İstanbul, Türkiye

ORCID ID: 0000-0002-8419-971X

Ahmet FEYZİOĞLU

Dr. Öğr. Üyesi, Marmara Üniv., Teknoloji Fakültesi, Makine Mühendisliği Bölümü, İstanbul, Türkiye

ORCID ID: 0000-0003-0296-106X

ÖZET

Bir hizmet sağlayıcısı ile müşteri arasında; hizmetin kalitesi, kullanılabilirliği, devamlılığı, sorumlulukları gibi yönleri konusunda yapılan anlaşmalar olan hizmet seviyesi sözleşmeleri (Service Level Agreement - SLA), anlaşma kapsamında verilen hizmet ve alınan hizmetin, sözleşmede belirlenen anahtar performans göstergeleri (Key Performance Indicator - KPI) ile ne derece karşılandığını incelemektedir. Bu kapsamda hizmet talepleri; belirlenen metrikler, sorumluluklar ve beklentiler üzerinden, hizmeti sağlayan ve talep eden tarafların mutabık kaldığı şekilde yönetilmekte ve hizmetin kapsamı hakkında oluşabilecek düşünce ayrılıkları engellenmektedir.

Hizmet seviyesi sözleşmeleri ölçmesi zor olan, sürekli gelişen iş öncelikleriyle uyumlu olmayan ve istisnaları hesaba katmayan maddeler içerebilmektedirler. Bunun yanında, zamanla değişen koşullara bağlı olarak sözleşme içerisindeki yükümlülükler; operasyon maliyetini ve kapsamını değiştirmekte ve kurumların ilerleyen süreçlerde yapacakları faaliyetler konusunda karar alma süreçlerini öngörülemez şekilde etkilemektedirler. Sözleşmelerde yer alan metriklerin ölçülmesi, raporlanması ve karşılanması kritik süreçlerini doğru yönetilmek gerekmektedir. Bu çalışmanın amacı; şirketlerin takip ettikleri hizmet düzeyi sözleşmeleri sebebiyle uğrayabilecekleri zararları öngören, karlılığı arttırmayı hedefleyen, derin öğrenme ve makine öğrenmesi tabanlı tahminlemeler ve öneriler içeren bir platform geliştirmektir. Bu platform sayesinde, sözleşmelerdeki metrikler kullanılarak, şirketin kaynaklarını doğru kullanması, olası SLA ihlallerine karşı alacağı önlemleri öngörmesi, süreci yöneten veya çözüm üreten kişilerin proje içerisinde doğru şekilde değerlendirilmesi, kaybedilen zamanın nedenlerinin saptanıp zamanın daha etkin yönetilmesi konularında çözümler üretilecektir.

Anahtar kelimeler: Hizmet seviyesi sözleşmesi (Service Level Agreement - SLA), yönetim, anahtar performans göstergeleri (Key Performance Indicator - KPI), makine öğrenmesi, derin öğrenme.

ABSTRACT

Service Level AgreementS (SLA) between a service provider and a customer are agreements made on aspects of the service such as quality, availability, continuity and responsibilities, and examine the extent

to which the service provided and the service received are met with the key performance indicators (Key Performance Indicator - KPI) determined in the contract. In this context, service requests are managed through the determined metrics, responsibilities and expectations, in a way agreed by the parties providing and requesting the service, and differences of opinion that may arise about the scope of the services are prevented.

Service level agreements may contain clauses that are difficult to measure, inconsistent with ever-evolving business priorities, and do not take exceptions into account. In addition, the obligations in the contract can change the cost and scope of operations and affect the decision-making processes of institutions in the future in an unpredictable way, depending on the changing conditions over time. It is necessary to manage the critical processes of measuring, reporting and meeting the metrics in the contracts correctly. So the aim of this study is to develop a machine learning and deep learning based platform that predicts the losses that companies may suffer due to the service level agreements they follow, and aims to increase profitability. Through this platform, by using the metrics in the contracts, solutions will be produced for the company to use its resources correctly, to anticipate the measures to be taken against possible SLA violations, to correctly evaluate the people who manage the process or produce solutions within the project, to determine the causes of lost time and to manage time more effectively.

Keywords: Service level agreement (SLA), management, key performance indicator (KPI), machine learning, deep learning.

SAVUNMA SANAYİ PROJESİ ÜRETİMİNDE PROJE DEĞERLENDİRME VE GÖZDEN GEÇİRME TEKNİĞİ (PERT) UYGULAMASI

PROJECT EVALUATION AND REVIEW TECHNIQUE (PERT) APPLICATION IN DEFENSE INDUSTRY PROJECT PRODUCTION

Cevriye TEMEL GENCER

Prof. Dr, Gazi Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği, Ankara, Türkiye

ORCID ID: 0000-0000-0000-0000

Mahide Begüm ÇİÇEK ASLAN

Gazi Üniversitesi, Fen Bilimleri Enstitüsü, Endüstri Mühendisliği, Ankara, Türkiye

ORCID ID: 0000-0003-4647-3244

ÖZET

Savunma sanayi projeleri, ülkelerin savunması ile ilgili olduğu için oldukça yüksek önem arz etmektedir. Bu projelerin hedeflerine ve hedeflenen noktalara ulaşabilmesi için projelerin etkin bir şekilde planlanması, yönetilmesi ve izlenmesi gerekmektedir. Savunma sanayi sektöründe proje yönetiminin önceliği, müşteri beklenti ve hedeflerini karşılayan gelişmiş askeri sistem ve teknolojilerin zamanında ve en verimli şekilde teslim edilmesini sağlamaktır. Bu çalışmada savunma sanayinde hizmet veren TUSAŞ firmasının karmaşık bir yapıya sahip olan bir savunma sanayi projesinin takviminde iyileştirme çalışmaları yapılmıştır. Bu çalışmada problem çözmede proje yönetimi tekniklerinden tekniklerinden Program Değerlendirme ve Gözden Geçirme Tekniği (PERT), Gantt Şeması, Delphi Tekniği ve hedef programlama kullanılmıştır. TUSAŞ'ta gerçekleştirilen bu çalışmada firmanın hali hazırda üretmekte olduğu bir ürün için her aşamada proje yönetimi basamakları uygulanmıştır. Söz konusu süreçlerde faaliyetlerin öncül ve ardılları tanımlanarak proje termin süresinin iyileştirme planı hazırlanmış ve devreye alınmıştır. Firmanın proje başlangıç tarihi ve termin tarihi göz önünde bulundurulduğunda verimliliğin anlamlı şekilde arttığı gözlenmiştir. Yapılan detaylı planlama ile proje izlem süreçleri sağlıklı bir şekilde yürütülebilmiş, proje ile ilgili darboğazlara hızlı müdahale olanağı sağlamıştır. Yapılan iyileştirmelerin devamlılığını sağlamak için; geliştirilen sistemde, öngörülen faaliyet süreleri ve gerçekleşmeler veritabanında tutularak yeni projelerde gerçekleşen sapmaların takibini otomatik hale getirmiştir.Bu ve bunun gibi metotların uygulanması ve geliştirilmesi ile termin süreleri ve kaynak kısıtları oldukça önem arz eden Savunma Sanayi Proje takvimlerinin optimize edilmesini sağlayacaktır.

Anahtar kelimeler: PERT, Gantt Şeması, Delphi Tekniği, Hedef Programlama

ABSTRACT

Defense industry projects are of high importance as they are related to the defense of countries. In order for these projects to reach their goals and targeted points, the projects must be planned, managed and monitored effectively. The priority of project management in the defense industry sector is to ensure that advanced military systems and technologies that meet customer expectations and targets are delivered on time and in the most efficient way. In this study, improvement studies were carried out in the calendar of a defense industry project, which has a complex structure, of TAI, which provides services in the defense industry. In this study, the Program Evaluation and Review Technique (PERT), Gantt Chart, Delphi Technique and goal programming from project management techniques were used in problem solving. In this study carried out in TAI, project management steps were applied at every stage for a product that the company is currently producing. In these processes, the antecedents and successors of the activities were defined, and the improvement plan for the project deadline was prepared and put into use. Considering the company's project start date and deadline, it was observed that

productivity increased significantly. With the detailed planning, the project monitoring processes could be carried out in a healthy way, and it provided the opportunity to quickly intervene in the bottlenecks related to the project. To ensure the continuity of the improvements made; In the developed system, projected activity periods and realizations are kept in the database, automating the follow-up of deviations in new projects. The implementation and development of these and similar methods will optimize the Defense Industry Project calendars, which are very important due to deadlines and resource constraints.

Keywords: PERT, Gantt Chart, Delphi Technique, Goal Programming

A CASE STUDY OF PHOTOACUSTIC EFFECT FOR TWO DIFFERENT THERMAL CONDUCTIVE MATERIALS

Damla CAN ATICI

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0009-0005-4341-948X

İbrahim AKKAYA

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0000-0003-0605-7115

Yavuz ÖZTÜRK

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0000-0002-9650-6350

ABSTRACT

Photoacoustic (PA) effect is a well known measurement technique and has many applications in biomedical imaging to material investigations. In this study, a single wavelength photoacoustic measurement setup with a modulation frequency (*f*) measurement scanning option is designed. The setup is utilized to show thermal diffusion and thermo elastic behaviors of two thermally distinct materials. An 808 nm laser diode (LD) is used as an excitation source. A function generator and a laser diode driver are used to drive the LD with a square wave at a constant current amplitude and modulated between 1 Hz to 5 kHz. A piezoelectric microphone is connected to a lock-in amplifier for the measurements. All devices are controlled by a developed program that has a computer interface to enter the necessary parameters. A polyvinyl chloride (PVC) black tape (electrical isolation tape) as a low thermally conductive material (0.12 – 0.25 W/mK) and a pyrolytic graphite as a high thermally conductive (along surface: 1000-1200 W/mK, along thickness: 15-20 W/mK) is chosen for measurements. The samples are placed on the center of a brass side of the microphone and laser illuminated on them. The dominant frequency response of PA results for the PVC tape is *1/f* and for the pyrolytic graphite is $1/f^{1.5}$. Additionaly, the resonance frequency of piezo microphone is determined as 3246 Hz for PVC and 3428 Hz for PG. It is found that both resonance frequency and amplitude depend on the thermal conductivity of material.

Keywords: Photoacoustic, low cost, thermal conductivity, NIR laser diode.

A NEW MODULATOR SURFACE DESIGN WITH FLUORESCENT LAMP ARRAY AS CURRENT CONTROLLED PLASMA REFLECTOR

Samed GÜMÜŞ

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir

ORCID ID: 0009-0009-3832-6691

Yavuz ÖZTÜRK

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0000-0002-9650-6350

ABSTRACT

In this study, use of a fluorescent lamp array as a current controlled rf modulator were investigated. The series connected fluorescent lamp array, which is a plasma source, was driven by a variac and a transformer. Output current of this 50Hz high voltage source is arranged between 5-25 mA. The lamp array placed between receiver and transmitter working at 10.5 GHz frequency. Corresponding transmission curves were recorded and analyzed. For 5 mA around 98% transmissions were obtained. The transmission is decreased by the increase of the current and minimum transmission around 2% is observed for 25 mA.

Keywords: Fluorescent *array, Microwave, RF modulator*

INVESTIGATION OF THE MAGNETIC FIELD AND IT'S LINEARITY ON AN AXIS BETWEEN OF TWO CYLINDIRICAL MAGNETS

Beste AYDOĞMUŞ

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir

Samed GÜMÜŞ

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir

ORCID ID: 0009-0009-3832-6691

Yavuz ÖZTÜRK

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0000-0002-9650-6350

ABSTRACT

In this study, the magnetic field of two cylindrical magnets in a configuration of poles facing each other are investigated in terms of magnetic field (magnetic flux density, B) and its linearity. These kinds of magnet sets are important for applications such as magnetic levitation, flow control, density measurement and several sensor applications. Magnet separation distance g, an important parameter which has influence on both linearity and total magnetic field, is investigated at the values of 5 mm, 10 mm, 15 mm. As other parameters the radius of the magnet investigated in the range of 1 mm to 15 mm with 1 mm steps. The length of the magnets and their magnetization are chosen as 10 mm and 1000 kA/m. It is found to be that the increase of g has a negative influence on linearity. Decrease of radius has a positive effect on the magnetic field.

Keywords: *Cylindirical Magnets, Linearity, Magnetic field*

MEASURING MAGNETIC FIELD OF A MAGNET ON A PLANE BY USING THREE AXES HALL SENSOR OF A SMARTPHONE

Mahshad RAMEZANABADY

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0009-0004-4671-8429

Utku Can SAYI

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0009-0004-0981-6759

Erkan Zeki ENGİN

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0000-0002-2249-3139

Yavuz ÖZTÜRK

Ege University, Engineering Faculty, Electrical and Electronics Engineering Department, Izmir, Türkiye

ORCID ID: 0000-0002-9650-6350

ABSTRACT

Measuring the magnetic field of magnets has an important place in technology, research, and education. There are many ways to measure the magnetic properties and magnetic field produced by permanent magnets, from VSMs such as versalite devices to low-cost miniature hall sensors. Many of these methods need analog or digital control and devices to convert measured voltage/current to magnetic fields. In the case of Hall sensors, many have only one axis measurement option, and their output is voltage. However, recent Android and iOS (MacOS) smartphones have three axis hall sensors, and it is very easy to measure magnetic fields in the order of the earth's magnetic fields (2T65 μT). In this study, the magnetic field of a cylindrical magnet was measured in a plane perpendicular to the cylinder's principal axis by a smartphone (iPhone 11). The magnet that was used in this research is neodymium. The height and diameter of the magnet were 10 mm and 18 mm, respectively. The plane and cylinder top distance was taken at 12 cm, and the phone moved with 1 cm steps in a 20 cm x 20 cm area. The magnetic field converts cartesian coordinates to spherical coordinates, and the resulting data is presented. We also try to predict the position of the magnet with respect to the phone by using a linear regression method. Then the errors between the predicted value and the original value were calculated. The results of this investigation have many applications in structural analysis, physics, energy transfer, and biomedical.

Keywords: Cylindrical magnet, magnetic field, smartphone, magnetic field sensor, three-axis Hall sensor, magnetic field on a plane.

KÖPÜK BETONLARDA FARKLI DOLGU MALZEMELERİNİN MEKANİKSEL ÖZELLİKLER ÜZERİNE ETKİLERİNİN İNCELENMESİ

INVESTIGATION OF THE EFFECTS OF DIFFERENT FILLING MATERIALS ON THE MECHANICAL PROPERTIES OF FOAM CONCRETES

Nazım KUNDURACI

Dr. Öğrt. Üye., Zonguldak Bülent Ecevit Üniversitesi, Mühendislik Fakültesi, Metalurji ve Malzeme Mühendisliği Bölümü, Zonguldak, Türkiye

ORCID ID: 0000-0002-0687-3860

ÖZET

Köpük beton ürünleri, hafif beton sınıfında gözenekli yapıda ve yalıtım değeri yüksek yapı malzemeleridir. Son yıllarda özellikle yalıtıma ihtiyaç duyulan soğuk iklim bölgelerinde ve deprem bölgelerindeki konutlarda oldukça tercih edilir bir malzeme haline gelmektedir. Köpük beton üretimi iki aşamada gerçekleşmektedir. İlk aşamada, beton üretiminde olduğu gibi beton massesi hazırlanırken, ikinci aşamada köpük ajanı bu beton masse ile karıştırılır. Bu çalışmada da köpük beton üretiminde köpükleştirici ajan yöntemi kullanılarak denemeler yapılmıştır. Beton masse içerisine mekaniksel özellikleri değiştirebileceği araştırılan, kum, kaolen ve seramik atıkları kullanılmıştır. Referans olarak da herhangibir dolgu malzemesi bulunmayan reçete tercih edilmiştir. Numuneler 15cmx15cmx15cm boyutlarında küpler şeklinde hazırlanmıştır. Numunelerin kuru ağırlığı 400kg/m3 ile 600kg/m3 aralığında olacak şekilde hazırlanmıştır. Her bir küp numunesi 28 günlük standart kurutma işlemine tabi tutularak teste alınmıştır. Küp numunelere, basma testi ve su emme testleri yapılarak mekaniksel etkiler incelenmiştir.

Anahtar kelimeler: Köpük beton, dolgu malzemesi,seramik atık.

ABSTRACT

Foam concrete products are building materials with a porous structure and high insulation value in the lightweight concrete class. In recent years, it has become a highly preferred material especially in cold climate regions where insulation is needed and in houses in earthquake regions. Foam concrete production takes place in two stages. In the first stage, while the concrete masses are prepared, as in concrete production, the foaming agent is mixed with this concrete mass in the second stage. In this study, experiments were carried out using the foaming agent method in the production of foam concrete. Sand, kaolin and ceramic wastes, which were investigated to change the mechanical properties of the concrete mass, were used. As a reference, the recipe without any filling material was preferred. The samples were prepared as cubes of 15cmx15cmx15cm dimensions. The dry weight of the samples was prepared to be between 400kg/m3 and 600kg/m3. Each cube sample was subjected to a 28-day standard drying process and taken to the test. Mechanical effects were investigated by performing compression test and water absorption tests on cube samples.

Keywords: Foam concrete, filling materials, ceramic waste.

ORIGIN OF RASHBA SPIN SPLITTING EFFECT IN HETEROSTRICTURES

Loubna MELAAB

Farhat Abbas University, Faculty of sciences, Department of Physics, Setif, Algeria

ORCID ID: 0009-0007-5057-9726

ABSTRACT

It has been pointed out that the average electric field contributes only a small portion of the Rashba spin splitting, the interfaces make a major contribution to the Rashba spin splitting [1]. In the current study, we take into consideration a GaAs/AlGaAs heterostructur with sharp interfaces produced in the [100] crystallographic direction and study in detail the spin characteristics of its electrons occupying the bound states and forming the 2D electron gas. In order to identify the electronic structure in the presence of an external electric field, we first use the envelope function scheme and the variational method. This yields the energy spectrum and the corresponding wavefunctions that are needed later.

We start by concentrating on the Rashba parameter, which is calculated for various field strengths and heterostructure physical factors. Additionally, the specific contributions of the various interfaces are estimated and broken down into their many physical sources, including those originating from the transverse mass mismatches, the conduction-band offset, the parallel to the interface mass mismatch, and the SO coupling mismatch between wells and barriers [2]. The total spin splitting, which is really determined experimentally, is also computed.

The results of the current study provide strong support for the hypothesis that discontinuities in the band-structure parameters within the conduction band are the source of the zero-field spin splitting in heterostructures. In the present treatment, we explicitly demonstrate that a discontinuity in mass parallel to the interface generates supplementary spin splitting. In the case of most III-V semiconductors, the conduction-band mass at the band edge is isotropic. Consequently, for heterostructures composed of these materials, a transverse mass discontinuity is always accompanied by a parallel mass mismatch. Still going further, we show that discontinuities in the bulk spin-orbit coupling constant λ also contribute to additional spin splitting. In a GaAs/$Ga_{0.7}Al_{0.3}$/$Ga_{0.9}Al_{0.1}$As/$Ga_{0.7}Al_{0.3}$As/GaAs double quantum well, these additional contributions are found to be of the same order as the contributions of the well-known transverse mass discontinuity term. In fact, these two terms tend to counterbalance each other, and only considering the effect of transverse mass discontinuity without incorporating the spin-orbit coupling mismatch would result in spin splittings that are too small compared to experiment.

Keywords: Rashba spin-orbit, Double Quantum Well,Mass mismatch, Interface Contributions

STRAIN BASED FINIT ELEMENT FORMULATION FOR THE ANALYSIS OF HOMOGENEOUS PLATES

CHENAFI Madjda

University of Biskra, Science and technology faculty, Civil Engeneering and Hydraulic Department, Reaserch Laboratory LAHE, Biskra, Biskra

BOUREZZANE Messaoud

University of Biskra, Science and technology faculty, Civil Engeneering and Hydraulic Department, Reaserch Laboratory LAHE, Biskra, Biskra

ASSAS Taqiyeddine

University of Biskra, Science and technology faculty, Civil Engeneering and Hydraulic Department, Reaserch Laboratory LAHE, Biskra, Biskra

ABSTRACT

In this work, a new type of quadrilateral finite element is introduced, which is based on the strain approach and the first-order shear deformation theory for analyzing static plates. This novel element consists of four nodes and has six essential degrees of freedom per node. It is obtained by combining two strain-based elements: the first element represents a membrane with three degrees of freedom per node, while the second element represents a Reissner-Mindlin plate with three degrees of freedom per node. The displacement field of this newly developed element incorporates higher-order terms and is defined using assumed strain functions that satisfy compatibility equations. To evaluate the performance of the proposed element, several tests are conducted, and the results are compared against existing solutions in the literature. The outcomes demonstrate that the suggested element exhibits excellent accuracy and efficiency in predicting plate bending.

Keywords: Strain approach . Finit element. Mindlin plate

ANALYSIS OF THE VARIATION OF AMBIENT AIR PARAMETERS ON THE GAS TURBINE OUTPUT

BENNOUD Salim

Université de BLIDA 1 (SAAD DAHLAB), Algeria

SALHI Merouane

Université de BLIDA 1 (SAAD DAHLAB), Algeria

ABSTRACT

Power generation turbines (PGT) are rotating and thermodynamic machines that allow to ensure an energy conversion. They are used in aeronautics as well as in the field of electricity production.

Power generation turbines (PGT) turbines operating on natural gas can be employed in locations where air proprieties as temperature and pressure can readily be changed. So, working under different proprieties presents great challenges.

The analysis resulting from documentation relating to the subject shows that the operation performances of PGT turbine are very sensitive to the parameters variation of the ambient air such as the temperature. But the use of this kind of turbine remains the most judicious solution to fulfill environmental and climatic conditions and requirements of an extreme medium such as the desert or the oil and gas platforms.

The aim of our work is to determine energy characteristics of a gas turbine implemented in an aggressive and extreme environment of work where the parameters variation of the ambient air can reach remarkable values on a selected interval of time.

The theoretical study of problem is carried out basing on thermodynamics equations and chemical reactions.

The energy analysis makes it possible to determine thermodynamic parameters (static, dynamic or different) in various stations of the turbine as well as the expressions of real and theoretical output.

The real and theoretical output of the gas turbine are initially determinate, and the evolution of some thermodynamic parameters such as the temperature, the compression ratio, the pressure, the mass proportioning, etc, according to the change of the temperature of the ambient air will be evaluated and examined thereafter.

Calculus and simulations carried out prove that the turbine is very sensitive to the variation in the temperature of the ambient air and that the temperatures of the various stations do not evolve in the same way. Thus, the global output of the turbine declines when the temperature variation increases. This output can have a fall of a rate nearly 3% for a rise in temperature of 5°C.

Keywords: turbine output, Power generation turbines (PGT), thermodynamic parameters.

COMPARISON OF ORDINARY AND UNIVERSAL KRIGING INTERPOLATION TECHNIQUES USING GSTAT

Dendouga IMANE

University Mohamed Khider, Departments of Civil Engineering and Hydraulics, Biskra, Algeria

Abdelhamide MESSAMEH

University Mohamed Khider, Departments of Civil Engineering and Hydraulics, Biskra, Algeria

ABSTRACT

In recent times, human activity has increased, and during this time, a lot of air or water pollution caused by industrial waste, coal ash, or chemical spills has occurred. These are examples of pollution that can pollute the environment and damage human health. To solve this problem, we need a method that is capable of predicting contaminant levels at unobserved locations. Therefore, the geostatistical method is the application of statistics to geological observations for prediction and mapping in unobserved locations. In this research, two types of interpolation methods are compared: universal kriging, which is an interpolation method that has a tendency to drift, and a special evaluation method used to deal with non-stationary sample data using ordinary kriging. Using Gstat R is a program based on the open source software R that can be used to predict pollutants in rivers at unobserved locations. The aim of this paper is to describe and compared the OK and UK methods by mapping a zinc variable, and their advantages and disadvantages will be discussed

Keywords: universal kriging, ordinary kriging, geostatistic, variogram.

$g^{**}\beta$ –Compact and $g^{**}\beta$ –Lindelof Topological Spaces

Raja Mohammad LATIF

Department of Mathematics and Natural Sciences, College of Sciences and Human Studies, Prince Mohammad Bin Fahd University, P.O. Box 1664 Al Khobar, Kingdom of Saudi Arabia

ORCID NO: 0000-0003-3140-9581

ABSTRACT

Most references on topological spaces seem to define a compact space in terms of open coverings of a space having finite sub coverings. Formally, we say that a collection of open sets $\{U_i : i \in I\}$, indexed by some set I, is an open covering of a topological space K if $K \subseteq \bigcup_{i\in I} U_i$. We define K to be compact if there exist finitely many open sets $U_{i_1}, U_{i_2}, ..., U_{i_n}$ in the open covering such that $K \subseteq \bigcup_{j=1}^{n} U_{i_j}$. There exists a number of equivalent definitions of a compact space, which we briefly mention here. A topological space K is compact if and only if K has the finite intersection property: if $\{E_i : i \in I\}$ is a collection of a closed sets indexed by a set I such that, for any finite subset $I_0 \subseteq I$, $\bigcap_{i\in I_0} E_i \neq \phi$, then $\bigcap_{i\in I} E_i \neq \phi$. Another equivalent definition is in terms of nets. A topological space K is compact if and only if every net $(x_\alpha : \alpha \in \Lambda)$ in K has a convergent subnet. In 2023, T. Delcia introduced a new kind of an open set which is called a $g^{**}\beta$ –open set. Also, he studied and discussed some of its properties and compared this new notion with some other classes of sets. We will extend the concept of compactness via $g^{**}\beta$ –open sets by introducing $g^{**}\beta$ –compact spaces in topological spaces and will investigate its characterizations by making use of generalized mappings including $g^{**}\beta$ –continuous functions and $g^{**}\beta$ –irresolute functions. The objective of this paper is to introduce the new concepts called $g^{**}\beta$ –compact space and $g^{**}\beta$ –Lindelof space, countably $g^{**}\beta$-compact space, almost $g^{**}\beta$-compact space, and mildly $g^{**}\beta$-compact space in topological spaces and investigate fundamental properties and characterizations of these new notions of spaces in topological spaces.

2020 AMS Subject Classification. Primary: 54B05, 54D20, 54D30.

Keywords: Topological space, $g^{**}\beta$ –open set, $g^{**}\beta$ –closed set, $g^{**}\beta$ –compact space, $g^{**}\beta$ –Lindelof space, countably $g^{**}\beta$-compact space, almost $g^{**}\beta$-compact space, mildly $g^{**}\beta$-compact space.

$g^{**}\beta$ –CONTINUOUS AND $g^{**}\beta$ –IRRESOLUTE MAPPINGS IN TOPOLOGICAL SPACES

RAJA MOHAMMAD LATIF

Department of Mathematics and Natural Sciences, College of Sciences and Human Studies, Prince Mohammad Bin Fahd University, P.O. Box 1664 Al Khobar, Kingdom of Saudi Arabia

ORCID ID: 0000-0003-3140-9581

ABSTRACT

Analysis is one of the greatest achievements in the history of mathematics. The achievement opens a new era of mathematical progress and plays an important role in the development of physics, astronomy, signal processing and other disciplines. At the end of the 19th century, mathematicians deduced many properties of continuous functions on closed intervals, which undoubtedly promoted the development of analytical theory. Bolzano's Function Theory gives the earliest proofs of the Boundedness theorem and the Extreme value theorem and Weierstrass proved the Extreme value theorem in Berlin lecture. The Intermediate value theorem was first proved in 1817 by Bolzano, and then Cauchy gave a proof in 1821. The definition of uniform continuity is proposed by Heine, and he published a proof of the Uniform continuity theorem. There are some important properties of continuous functions on closed intervals including Weierstrass second theorem: Boundedness theorem, Weierstrass first theorem: Extreme value theorem, Bolzano-Cauchy second theorem: Intermediate value theorem, Cantor theorem: Uniform continuity theorem. Continuous functions have four fundamental properties on closed intervals: Boundedness theorem, Extreme value theorem, Intermediate value theorem, Uniform continuity theorem. These theorems are the basis of mathematical analysis and the direct expression of real number theory in functions. In 2023, T. Delcia introduced a new kind of an open set which is called a $g^{**}\beta$ –open set. Also, they studied and discussed some of its properties and compared this new notion with some other classes of sets and investigated some of their basic properties in topological spaces. We introduce $g^{**}\beta$ –continuous function, $g^{**}\beta$ –irresolute function, $g^{**}\beta$ –open function, $g^{**}\beta$ –closed function, pre –$g^{**}\beta$ –open function, pre –$g^{**}\beta$ –closed function and investigate several properties and characterizations of these new types of mappings in topological spaces.

Mathematics Subject Classification (2020): 54C05, 54C08, 54C10.

Keywords and Phrases: Topological space, $g^{**}\beta$ –open set, $g^{**}\beta$ –closed set, $g^{**}\beta$ –interior set, $g^{**}\beta$ –closure set, $g^{**}\beta$ –continuous function, $g^{**}\beta$ –irresolute function, $g^{**}\beta$ –open function, $g^{**}\beta$ –closed function, pre –$g^{**}\beta$ –closed function, pre –$g^{**}\beta$ –open function.

DOĞAL LİF TAKVİYELİ KOMPOZİT FİLAMENT İMALATI

NATURAL FIBER-REINFORCED COMPOSITE FILAMENT MANUFACTURING

Tuğçe TEZEL

Doçent Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0003-0139-442X

Volkan KOVAN

Profesör Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0002-0599-525X

ÖZET

Sıfır atık, atık yönetim felsefesini anlatmak için yaygın bir şekilde kullanılan, günden güne daha fazla yerde karşımıza çıkan bir terimdir. Bu yaklaşıma göre, atığa neden olan etkenler incelenir ve atık malzemelerin geri dönüşüm aracılığı değerlendirilmesi sağlanır. Bu atıklar incelendiğinde bazıları doğaları gereği endüstriyel alanda kullanıma uygundur. Muz kabuğu, doğal lifleriyle bilinen bir üründür. Başta tekstil olmak üzere çeşitli endüstrilerde bu doğal atığın ürünlerinden yararlanılmaktadır.

Makine imalatında kullanılan malzemeler arasında kompozitler günden güne kullanılan farklı takviyelerle öne çıkmaktadır. Özellikle doğal lifler, kompozit imalatında doğal takviye olarak kullanılabilmektedir.

Bu çalışmada eklemeli imalat tekniklerinden ergiyik biriktirme tekniğinde (FDM) kullanılmak üzere kompozit filament imalatı gerçekleştirilmiştir. Kompozitin esas malzemesi olarak biyopolimer malzemelerden polilaktik asit, takviye malzemesi olaraksa muz kabuğu kullanılmıştır. Çalışma sonucunda doğal katkılı kompozit filament eldesi sağlanmıştır.

Anahtar kelimeler: kompozit, filament, FDM, eklemeli imalat

ABSTRACT

Zero waste is a term widely used to describe the waste management philosophy and is seen in more and more places daily. According to this approach, the factors that cause waste are examined, and the waste materials are evaluated through recycling. When these wastes are examined, some of them are suitable for industrial use due to their nature. Banana peel is a product known for its natural fibers. The products of this natural waste are used in various industries, especially in textiles.

Among the materials used in machine manufacturing, composites come to the fore with different reinforcements used daily. Especially natural fibers can be used as natural reinforcement in composite manufacturing.

In this study, composite filament production was carried out to be used in the fused deposition modelling (FDM), one additive manufacturing technique. Polylactic acid, one of the biopolymer materials, was used as the primary material of the composite, and banana peel was used as the reinforcement material. As a result of the study, the naturally reinforced composite filament was obtained.

Keywords: composite, filament, FDM, additive manufacturing

MODERN İMALAT YÖNTEMLERİNE UYGUN TASARIM İLKELERİ

DESIGN PRINCIPLES FOR MODERN MANUFACTURING METHODS

Tuğçe TEZEL

Doçent Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0003-0139-442X

Volkan KOVAN

Profesör Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0002-0599-525X

ÖZET

Geleneksel imalat yöntemlerinde işlemede yaşanan zorluklar, fazla talaş sebebiyle oluşan maliyet, parçaların karmaşık geometrileri gibi çeşitli sorunlar alternatif işleme metotlarının araştırılmasına neden olmuştur. Geleneksel talaşlı imalat yöntemlerinin getirdiği zorluk ve sınırlamalar, daha modern talaş kaldırma tekniklerinin gelişmesini sağlamıştır. Bu tekniklerde, geleneksel talaşlı imalattan farklı olarak parça yüzeyinde fark edilebilen bir talaş ya da işleme izi bulunmaz. Kimyasal, elektrokimyasal, mekanik ya da termal işleme gibi çeşitli modern işleme teknikleri mevcuttur. Kimyasal işlemede, şekillendirme parçanın kimyasal ayrıştırıcıya daldırılmasıyla; elektrokimyasal işlemede ise elektroliz esasına dayanır.

Bu çalışmada modern imalat yöntemlerinden kimyasal ve elektrokimyasal işleme koşulları ele alınarak, bu üretim tekniklerine uygun tasarım önerilerinde bulunulmuştur. Bu tasarım kriterlerine dikkat edilmek suretiyle başta maliyet düşüşü olmak üzere birçok olumlu etki sağlanabilir.

Anahtar kelimeler: imalat, talaş, işleme, tasarım, kimyasal, elektrokimyasal

ABSTRACT

Various problems, such as the difficulties experienced in machining in traditional manufacturing methods, the cost due to excessive chipping, and the complex geometries of the parts, have led to the search for alternative machining methods. The difficulties and limitations of traditional machining methods have led to more modern machining techniques. Unlike conventional machining, these techniques have no discernible chip or machining trace on the part's surface. Various modern processing techniques are available, such as chemical, electrochemical, mechanical, or thermal. In chemical processing, the forming part is immersed in the chemical separator; electrochemical processing is based on electrolysis.

This study discusses chemical and electrochemical processing conditions, which are modem manufacturing methods, and design suggestions are made in accordance with these production techniques. By paying attention to these design criteria, many positive effects can be achieved, especially cost reduction.

Keywords: manufacturing, sawdust, machining, design, chemical, electrochemical

OTOMOBİL PİSTONLARININ EKLEMELİ İMALATTA KULLANILABİLİRLİĞİNİN NÜMERİK ANALİZİ

NUMERICAL ANALYSIS OF THE USAGE OF VEHICLE PISTONS IN ADDITIVE MANUFACTURING

Gülsüm TEKAVİT

Makine Mühendisliği Lisanüstü Öğrencisi, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0001-7119-2925

Tuğçe TEZEL

Doçent Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0003-0139-442X

Volkan KOVAN

Profesör Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0002-0599-525X

ÖZET

Piston, yanma odasının alt kısmını oluşturan silindirde hareket halinde bir elemandır. Pistonun hareketi esnasında yön değiştirmesi sebebiyle büyük kuvvetler üretilir. Motor içerisindeki sürtünmenin önemli bir kısmı piston tertibatının hareketinden kaynaklanır. Bu nedenle pistonların geliştirilmesi motor verimliliğini etkileyen unsurlar arasındadır. Motor verimliliğini artırmaya yönelik çalışmalar arasında, pistonun üretim metodunun etkileri de yer almaktadır. Piston imalatında yaygın olarak döküm, plastik şekillendirme, talaşlı imalat gibi geleneksel yöntemler kullanılır. Eklemeli imalat gibi daha modern teknolojilerin gelişmesi ile pistonlar bu yeni üretim tekniklerine göre çeşitli etkiler almaktadır.

Bu çalışmada, bir araca ait piston modellenerek nümerik analiz yapılmıştır. Eklemeli imalatta kullanılan malzemeler analiz edilmek suretiyle malzeme davranışları detaylı olarak incelenmiştir. Böylelikle piston imalatında yeni üretim tekniklerinin uygulanabilirliği ortaya konmuştur.

Anahtar kelimeler: piston, eklemeli imalat, nümerik analiz, ANSYS

ABSTRACT

The piston is a moving element in the cylinder that forms the lower part of the combustion chamber. During the movement of the piston, significant forces are produced due to the change of direction. The movement of the piston assembly causes a significant part of the friction inside the engine. For this reason, the development of pistons is among the factors affecting engine efficiency. Among the studies aimed at increasing engine efficiency are the effects of the production method of the piston. Conventional casting, plastic forming, and machining methods are commonly used in piston manufacturing. With more modern technologies like additive manufacturing, pistons receive various effects according to these new production techniques.

In this study, numerical analysis was performed by modeling the piston of a vehicle. Material behavior has been examined in detail by analyzing the materials used in additive manufacturing. Thus, the applicability of new production techniques in piston manufacturing has been demonstrated.

Keywords: piston, additive manufacturing, numerical analysis, ANSYS

ORNİTHOPTER TEKNOLOJİLERİNİN GELİŞİMİ

DEVELOPMENT OF ORNITHOPTER TECHNOLOGIES

Sait BÜYÜKKAYA

Makine Mühendisliği Lisanüstü Öğrencisi, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0009-0005-6231-1837

Volkan KOVAN

Profesör Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0002-0599-525X

Tuğçe TEZEL

Doçent Doktor, Akdeniz Üniversitesi, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Antalya, Türkiye

ORCID ID: 0000-0003-0139-442X

ÖZET

İnsanlar için uçma hayali gerçekleşmeden çok önce, hava sahası kuşlar ve böcekler gibi doğal uçucular tarafından kullanılmıştır. Uçuşlarındaki doğal kolaylık ve zarafet, uçaklara ve kontrol sistemlerindeki teknolojiye hala ilham kaynağı olmaktadır. Bir başka deyişle havacılığın ilk günlerinden bugünün uçaklarına kadar özellikle kuşlar, doğal bir model olarak hizmet etmişlerdir. Doğal modelin gözlemlenmesinin aerodinamiği anlamak için belirleyici olduğu, ancak tahrik mekanizmasının bir kopyasının yapılamayacağı düşünülmüştür. Çünkü insanların aksine, kuşların kanatlarını çırpmalarını sağlayan son derece güçlü tahrik kasları bulunmaktadır. Kas gücüyle çalışan, uçuşa elverişli bir ulaşım aracı, bu nedenle, nispeten zayıf insan kasları nedeniyle başarısız olmuştur. Ancak kanat çırparak uçuşun havacılık için uygun olmadığı ortaya çıkmasına rağmen, yaydığı etki tarih boyunca hiçbir zaman kaybolmamıştır. Tüm bu sebeplerden ötürü modern uçak tasarımları birçok açıdan mükemmel olsa da yükselen bir kuşun manevra kabiliyetine ulaşabilmesi oldukça zordur.

Bu çalışmada, büyük kuşların seyir uçuşunu taklit eden ve uzun süre uçuş gerçekleştiren kuşların uçuş mekanizmaları ve vücut yapılarının incelendiği literatürdeki çalışmalar derlenerek ornithopter teknolojilerinin tarihsel gelişimi incelenmiştir.

Anahtar kelimeler: ornithopter, uçuş aerodinamiği, uçuş mekanizmaları

ABSTRACT

Long before the dream of flying come true for humans, airspace was used by natural volatiles such as birds and insects. Their flight's natural ease and grace still inspire aircraft and the technology in their control systems. In other words, birds, in particular, have served as a natural model from the early days of aviation to today's airplanes. Observation of the natural pattern was thought to be decisive for understanding aerodynamics, but a copy of the propulsion mechanism could not be made. Because, unlike humans, birds have potent propulsion muscles that enable them to flap their wings. Therefore, a muscle-powered, airworthy transport has failed due to relatively weak human muscles. However, even though flapping flight turned out to be unsuitable for aviation, the effect it spread has remained throughout history. For all these reasons, although modern aircraft designs are excellent in many ways, it is complicated for a soaring bird to achieve maneuverability.

In this study, the historical development of ornithopter technologies was examined by compiling studies in the literature examining the flight mechanisms and body structures of birds that imitate the cruising flight of large birds and perform long-term flights.

Keywords: ornithopter, flight aerodynamics, flight mechanisms

INVESTIGATION ON SOLAR PV DEFECTS BY USING ARTIFICIAL INTELLIGENCE AND DEEP LEARNING

Alhassan Issah FOFANA

Department of Mechanical Engineering, Faculty of Engineering, Istanbul Aydin University, Istanbul, Türkiye

Vedat ÖZTÜRK

Assist. Prof. Dr., Department of Mechanical Engineering, Faculty of Engineering, Istanbul Aydin University, Istanbul, Türkiye

ABSTRACT

One of the main sources of renewable energy in the globe is solar electricity. Electricity may be produced anywhere the sun shines with solar devices. These systems should be evaluated on a regular basis to prevent efficiency losses in photovoltaic systems. This paper discusses the use of thermal pictures captured by thermal camera to identify cell, module, and panel problems in PV systems. During the investigation, an Infrared Thermal Camera would be used to capture the thermal photographs of photovoltaic systems at Istanbul Aydin University. Using the obtained thermal pictures, a thermal data group would be formed with damages from the PV systems. These generated dataset would be used to train the convolutional neural network (CNN) powered by Visual Geometry Group 16 (VGG16) deep learning model. The embedded AI (Artificial Intelligence) computing system VGG16 would be used for this training. It would be determined during the VGG16 network's training that the defects listed in the training was adequately identified.

Keywords: Deep learning, thermal camera, Convolution Neural Network, Architecture, Visual Geometry Group.

A NEW FINITE DIFFERENCE SCHEME FOR SOLVING TRANSMISSION LINE EQUATIONS IN A CLASS OF DISCONTINUOUS FUNCTIONS

Bahaddin SINSOYSAL

Istanbul Gedik University, Faculty of Engineering, Department of Computer Engineering, Kartal, Istanbul, Türkiye

ORCID ID: 0000-0003-2926-2744

Mahir RASULOV

Institute of Oil and Gas of ANAS, Department of Numerical Modeling of Intralayer Dynamic Processes, Baku, Azerbaijan

ORCID ID: 0000-0002-8393-2019

Ethem Ilhan SAHIN

Adana Alparslan Türkes Science and Technology University, Advanced Technology Research and Application Center, Adana, Türkiye

ORCID ID: 0000-0001-7859-9066

ABSTRACT

This paper is devoted to study of a new finite difference scheme for solving transmission line equations, also called telegraph equations, in a class of discontinuous functions. Since the solution of the telegraph equation has weak discontinuity on the characteristics, this property does not allow the application of classical numerical methods well known from the literature. Moreover, the classical numerical methods fail even more when the initial functions have singular points. For this reason, firstly, the Riemann invariants for the system of transmission line equations is founded, and then an auxiliary problem with high differentiability, which is not present in the considered problem, is included. That the differentiable property of the solution of the auxiliary problem is one order higher than the differentiability of the solution of the transmission line problem lets to performed simple and well-structured algorithm to the auxiliary problem. Thus, using this advantage of the auxiliary problem, an efficient and economical algorithm via finite differences scheme is proposed for obtaining a numerical solution of the transmission line problem, which properly reflects all physical properties of the problem.

Keywords: Transmission line equation, Riemann invariants, finite differences scheme in a class of discontinuous functions.

THE EFFECTIVENESS OF WHEAT STRAW AND OTHER PLANTS ON THE MORPHOLOGY AND PRODUCTIVITY OF *AGARICUS BISPORUS*

AJAYDESOUZA V

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0009-0006-8526-0742

Sathiya ARAVİNDAN V

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0000-0002-8556-7801

LOKESH R

PG Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0009-0003-6040-6758

VİGNESH K

Ph. D Scholar, Department of Plant Pathology, Faculty of Agriculture, Annamalai University

ORCID ID: 0000-0003-4484-3862

ABSTRACT

The white button mushroom, *Agaricus bisporus*, is one of the most widely grown mushroom species in the world. The substrate or growing media used in mushroom culture is critical, affecting both the form and productivity of *Agaricus bisporus*. While wheat straw and other plants can be utilised as possible substrates, their efficiency depends on a number of parameters. Here's a rundown of how wheat straw and other plants affect the shape and productivity of *Agaricus bisporus*. The composition of the substrate, which includes wheat straw and other plants, influences *Agaricus bisporus* growth and development. Wheat straw is high in lignocellulosic material, which serves as a carbon source for mushroom mycelium. Other plants that can be used in mushroom production include corn stalks, sugarcane bagasse, and sawdust. The efficiency of these substrates is determined by their nutritional and lignin content, as well as the availability of easily accessible carbohydrates for mushroom development. Wheat straw and other plants contain a variety of nutrients such as carbon, nitrogen, and minerals. The availability and balance of these nutrients in the substrate are critical for *Agaricus bisporus* development and production. Wheat straw, for example, is low in nitrogen but high in carbon. To maximise its efficiency, it may be necessary to supplement with nitrogen sources such as chicken dung or nitrogen-rich supplements to increase mushroom harvests. Mushroom morphology and productivity are influenced by the physical structure of the substrate. Wheat straw and other plants can help to create a loose, porous substrate that allows for appropriate aeration and moisture retention. Aeration encourages good mycelial growth and the formation of robust fruiting bodies. However, if the substrate gets excessively compacted or does not retain adequate moisture, it can result in unsatisfactory mushroom development.

Keywords: *Agaricus bisporus* wheat straw, lignocellulosic material, corn stalks, sugarcane bagasse, and sawdust

POWERING THE FUTURE: THE SMART ENERGY REVOLUTION SMART ENERGY MANAGEMENT SYSTEM

Komal DUBEY

R.M.K. Engineering College

RAMYA NT

R.M.K. Engineering College

HARINI B

R.M.K. Engineering College

NIVETHA M

R.M.K. Engineering College

ABSTRACT

The Smart Energy Management System with Sensor Integration is a comprehensive solution designed to enhance power efficiency and optimize energy consumption in various environments. By incorporating a range of sensors such as occupancy sensors, ambient light sensors, temperature and humidity sensors, power usage sensors, and energy generation sensors, the system collects real-time data to provide intelligent insights and recommendations for energy management.

Through continuous monitoring and analysis of sensor data, the system identifies energy-saving opportunities and offers recommendations for optimizing lighting, and other energy-consuming devices. These recommendations are based on advanced algorithms and machine learning techniques, enabling users to make informed decisions to reduce energy wastage and lower costs.

This includes adjusting lighting levels, regulating temperature and ventilation, and optimizing energy generation from renewable sources. Users can access a user interface to monitor real-time energy data, customize settings, and track the system's performance.

By integrating sensors, data analysis, and intelligent decision-making algorithms. energy consumption, cost savings, improved comfort and productivity, lower carbon It reduced footprint, and enhanced equipment maintenance. The system can be tailored for diverse environments such as commercial buildings, industrial facilities, and residential spaces, contributing to sustainable energy management practices and a more efficient use of resources.

Keywords: Reduce energy consumption or wastages, Cost saving, Lower carbon footprint**,** intelligent decision-making**,** Lower carbon footprint**,** Sustainable energy management practises**,** Enhance power efficiency, Optimize energy consumption.

IOT BASED SMART LOCK DOOR SYSTEM USING RASPBERRY PI

DHULASİRAMAN M

R.M.K Engineering college, Kavaraipettai-601206, India

RAHUL D

R.M.K Engineering college, Kavaraipettai-601206, India

Arshath AHAMED H

R.M.K Engineering college, Kavaraipettai-601206, India

P.S LATHAMAHESHWARI

Dr., R.M.K Engineering college, Kavaraipettai-601206, India

S. RAMYA

Dr, R.M.K Engineering college, Kavaraipettai-601206, India

P. RADHİKA

Dr., R.M.K Engineering college, Kavaraipettai-601206, India

ABSTRACT

Objectives: Our goal was to create ***LOCK DOOR SYSTEM USING RASPBERRY P***I

Methods: This system is used for monitoring whether unknown person is entering into the house. System was established with communication and electronic devices through face detection with the help of Raspberry Pi platform. The face of authorized(known) persons is then stored in data. It checks whether the person is authorized or not. If the person is authorized then the door opens automatically and if not, the authorized person receives a message that someone is trying to intrude.

Results: We successfully made a People who tried it found it easy to use and were happy with it. If the authorized person wants to open the door for the unauthorized person it can be done and if authorized person doesn't want to open the door, then the unknown person receives a voice message from the authorized person. This automated door lock system can be widely used in homes.

Conclusions: People found it easy to use and liked it It provides a simple and versatile experience for users. This automated door lock system can be widely deployed in homes.

NiO SYNTHESIS, ELECTROCHEMICAL AND OPTICAL PROPERTIES

Marilena CARBONE

University or Rome Tor Vergata, Department of Chemical Science and Technologies, Rome, Italy

ORCID ID: 0000-0000-0000-0000

ABSTRACT

Energy harvesting and energy storage are preeminent issues, as fossil fuels are being depleted and alternatives become a necessity more than an aleatory option. When it comes to energy storage, Faradaic pseudocapacitors using oxidation-reduction reactions have the advantage over electrical double-layer capacitors (EDLC) of a higher capacitance, since the reactions occur both at the surface and near the surface of an active electrode. In seeking materials for potential extensive applications, NiO was stnthesized by the calcination of a precursor. The structural and morphological tuning were regulated by varying nickel salts or alkali used as the precipitating agents of the precursor and calcination temperature, time, as well as temperature ramp in the calcination phase. The influence of intercalating ions on the NiO pseudocapacitance was investigated by synthesizing $Ni(OH)_2$ precursors via the hydrothermal procedure. The effects of the synthesis on the NiO pseudocapacitance were investigated by a surfactant-free hydrothermal synthesis employing $Ni(NO_3)_2$ and either urea or moderately sterically hindered triethylamine (TEA). The syntheses were followed by the calcinations of precursors either at 400 or at 600 ◦C. Different morphologies, and the corresponding pseudocapacitances were compared. Optical properties such as band gaps are smaller for nanoparticles as compared to those of bulk materials, and in general, the smaller the particle size, the smaller the gap, going down to a lower limit, where the trend is reversed due to confinement effects. Since morphology and size can be synthesis-controlled, a correlation has been proposed between the NiO solvothermal synthetic process and optical properties as well as the calcination temperature. It was found that the reaction with TEA yielded nanoflowers whereas the morphology of the synthesis with urea varied with the calcination temperature and resulted in nanoparticles and nanoslices at calcination temperatures of 400 and 600 ◦C, respectively. In addition, it appeared that the synthesized nanosized NiO materials were suited for the performances of SPEs modifications in terms of peak-to-peak separation and anodic and cathodic currents also being morphology-dependent.

Keywords: NiO, synthesis, electrochemical properties, optical properties

DIVERSIFIED LIVELIHOOD, FLORISTIC INVENTORY, AND ECOLOGICAL CHARACTERISTICS OF NEWLY MERGED DISTRICT KURRAM

Farhan AHMAD

The University of Padjadjaran, Indonesia

Ristina Siti SUNDARI

Dr., Universitas Perjuangan

Ali SHER

Foundation for Rural Development (FRD)

ABSTRACT

Plantations are still a contentious aspect of rural development. The livelihoods of local farmers have primarily been negatively impacted by large-scale plantations that were created under land concessions, according to successive studies. This activity aimed to quantify the impact of the food/cash for labor project's Plantation Establishment Livelihood Improvement Scheme. These plantations will probably have more diverse effects on how local farmers make a living. By involving the participants for 5 cycles, the cooperating partner (CP) Foundation for Rural Development (FRD), sponsored by the World Food Program (WFP), takes the initiative for the plantation. The participants were selected after the Broad Based Community Meeting (BBCM) with the Village Development Committee (VDC). The participants were registered for the plantation activity under the criteria of the project. A total of 454 participants have been registered for the plantation of 168,875 plants in the Upper (35000 plants), Lower (70,800 plants), and Central (63,075 plants) Tehsil of District Kurram. The proposed participants for the activity of plantation were on different aspects of plant growing. During the training sessions the participants were taught the techniques of planting a plant, maintaining proper row to row and plant to plant distances. The selection of the participants were based on the criteria that one participant will grow 435 plants on one acre of land. Every Tehsil in District Kurram has seen an increase in demand for plantations. During the project's assessment phase, there is a high demand for plants including Pinus, Dalbergia, Eucalyptus, and Robinia. Communities have a favorable opinion of plantations. The plantation has a beneficial impact on the local economies of communities around forests. The program builds social and human capital, diversifies sources of income, and generates outcomes for livelihood in the form of better income, higher wellbeing, and improved food security, which enhances people's quality of life or enables them to reduce poverty levels. The project's goal is to provide food assistance for asset creation and a livelihoods program in Balochistan and KP's bordering regions with Afghanistan. The World Food Program (WFP) and the cooperating partner Foundation for Rural Development worked together implementing the project.

Keywords: Diversified, Livelihood, Floristic Inventory, Ecological, Characteristics

$BaHPO_4$ DEPOSITED ON DIFFERENT SUBSTRATES FOR THE ELECTRO-DEGRADATION OF RHODAMINE B

Ayoub AHDOUR

Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco

Ali AIT BAHA

Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco

Aziz TAOUFYQ

Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco

Latifa ANEFLOUS

Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco

Abdeljalil BENLHACHEMI

Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco

Bahcine BAKIZ

Ibn Zohr university faculty of science, Department of chemistry, Agadir, Morocco

ABSTRACT

A wide range of organic compounds are detected in industrial and municipal wastewater, which pose serious problems in the environment due to their resistance to biodegradation and traditional filtration processes. Advanced oxidation processes (AOPs) are favourable technologies that can generate radicals such as hydroxyl and sulphate radicals for the degradation of toxic substances in water due to their high degradation efficiencies, complete mineralisation capacity and environmentally friendly nature. Compared to other hydroxyl-based AOPs such as Fenton reactions and ozonation, electro-degradation and photo-electro-degradation have proven to be more cost-effective and environmentally friendly. The objective of this work is focused on the development of various phosphate-based catalysts and their use in the degradation of organic pollutants.

In this work, a facile method was performed to synthesise a new BaHPO4 anode by a one-step electrodeposition technique. The anode is characterised by a variety of methods: structural (XRD), morphological (scanning electron microscopy coupled to energy dispersive X-ray spectroscopy SEM-EDX) and electrochemical. The electrocatalytic activity (EC) of the samples is determined by studying the degradation of Rhodamine B (RhB) as a model organic dye. The EC performance varied depending on the type of substrate.

Keywords: Electrodeposition, $BaHPO_4$, Thin films, Dyes removal, Electrocatalysis.

EFFECTS OF ZINC OXIDE NANOPARTICLES ON GROWTH, CARCASS AND NUTRIENT DIGESTIBILITY IN MORI, *CIRRHINUS MRIGALA*, FINGERLINGS

Adan NAEEM

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

Syed Makhdoom HUSSAİN

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

Danish RİAZ

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

Eman NAEEM

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

ABSTRACT

Zinc-oxide (ZnO), a prevalent metal oxide, has recently been used as a feed supplement in the aquaculture industry due to its low toxicity and biocompatibility. In order to combat the deficiency of nutrients, this study addresses the effects of zinc-oxide nanoparticles (ZnO-NPs) in *Cirrhinus mrigala* fingerlings to check the growth, carcass and nutrient digestibility. A total of six iso-nitrogenous diets were prepared in a completely randomized design with graded levels of ZnO-NPs (0, 10, 20, 30, 40 and 50 mg/kg) in *Moringa oleifera* seed meal (basal diet). 15 healthy fingerlings (N=270; 7.133±0.05 g) were kept in triplicates for 70 days. The dietary exposure of ZnO-NPs resulted in following consequences. The significantly enhanced ($p<0.05$) growth parameters (weight gain%, specific growth rate and feed conversion efficiency) were observed when fingerlings fed 30 mg/kg of ZnO-NPs. In case of carcass (crude protein, 16.443%; crude fat, 3.43%; ash, 1.3% and moisture, 78.83%) and nutrient digestibility, the optimum level was noted at 30 mg/kg of ZnO-NPs. In conclusion, the supplementation of various concentrations of ZnO-NPs showed markedly alleviated ($p<0.05$) effects on the overall health and physiology of *C. mrigala* fingerlings than the control group. Nevertheless, they produced the best possible outcomes up to a certain extent (30 mg/kg) without compromising the quality of the fish.

Keywords: Zinc-oxide, nanoparticle, carcass trait, nutrient digestibility

AIR, SOIL AND NOISE POLLUTION IN THE OIL INDUSTRY, A CASE STUDY OF THE FULA AND AL-JECKE FIELDS IN WEST KORDOFAN STATE, SUDAN

Adam ABDELSAMAD

Baku State University, Faculty of Geography, Department of Economic and Social Geography, Baku, Azerbaijan

ORCID ID: 0000-0003-1359-7486

ABSTRACT

The pioneers of the first oil producers in the world did not believe that this nascent industry at that time would have a great impact on man and the elements of the natural environment such as water, air, soil, etc. This article aims to assess environmental pollution. Air and soil, in addition to noise pollution resulting from the oil industry in the Al-Fula and Al-Jake fields in the state of West Kordofan in Sudan.

To achieve this goal, the study used the results of laboratory tests conducted on soil samples, in addition to samples taken by the equipment from the air and places of noise resulting from the movement of machinery used in the oil industry. The study also used observational methods and conducted interviews with the local community to find out the impact of the oil industry on the elements of the natural environment, humans, and animals.

The study found that there is indeed contamination in the soil with heavy materials resulting from the oil spill and that these materials may interact with surface water during the rainy season and may affect humans and animals together. The study also found that air pollution in the area around the fields is less severe than what is found globally. However, this means that it may cause some health problems, especially for residents close to the oil fields, while the results of the study also indicated that there is no clear effect of the noise generated by the machines outside, especially the oil fields, except for a little noise from the trucks that transport supplies to the oil industry. to and from the oil fields.

The study recommended that activating government control over oil companies is necessary and cooperating with them in studies and research procedures to detect any pollution or health risks that threaten the environment and negatively affect human health.

Keywords: West Kordofan State, Oil industry, Air Pollution, Soil pollution, Noise Pollution, and Natural environment.

A FRACTIONAL ORDER BASED ADAPTIVE SYNCHRONIZATION OF CHAOTIC SYSTEM WITH UNKNOWN PARAMETERS

Mohsen Mohamed HADJ

National Polytechnic School of Algiers, Constantine, Algeria

Samir LADACI

National Polytechnic School of Algiers, Constantine, Algeria

ABSTRACT

In this paper the problem of synchronizing two continuous-time chaotic systems with transmitter, receiver configuration is considered. Based on Layaponov theory and fractional order proprieties,a fractional order adaptive observer-based response system is designed to estimate the transmitter's unknown parameters.

Simulation results illustrate the effectiveness of the proposed estimator, and the convergence of the synchronization based on this observer.

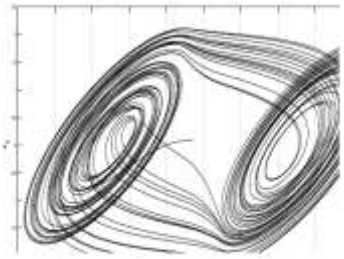
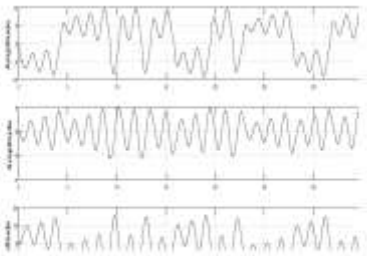


Fig. 1. chaotic attractor of Chua's circuit.



Index Terms: Fractional order system, Chua's circuit,Chaos synchronization, adaptive observer.

EFFECTS OF IRON OXIDE NANOPARTICLES ON GROWTH TRAITS, BODY COMPOSITION AND BLOOD INDICES IN *CYPRINUS CARPIO* FINGERLINGS

Eman NAEEM

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

Syed Makhdoom HUSSAİN

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

Danish RİAZ

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

Adan NAEEM

Fish Nutrition Laboratory, Department of Zoology, Government College University, Faisalabad, Pakistan

ABSTRACT

The bioavailability, small size and direct absorption in the blood make nanoparticles (NPs) a remarkable feed additive in the aquaculture industry. Therefore, dietary iron oxide nanoparticles (Fe_2O_3-NPs) were used to examine the effects of growth traits, body composition and blood indices on *Cyprinus carpio* fingerlings. Healthy *C. carpio* fingerlings (n=270) were fed six experimental diets (D1, 0 mg/kg Fe_2O_3-NPs/control; D2, 10 mg/kg Fe_2O_3-NPs; D3, 20 mg/kg Fe_2O_3-NPs; D4, 30 mg/kg Fe_2O_3-NPs; D5, 40 mg/kg Fe_2O_3-NPs; D6, 50 mg/kg Fe_2O_3-NPs), supplemented with canola meal based diet as basal diet. 15 fingerlings (average initial weight 5.51±0.04 g/fish) were kept in triplicates for 70 days to check the effects of growth, body composition and blood indices. The results indicated that maximum growth traits (WG%, 278.09±1.35; SGR%, 1.90±0.01 and FCR%, 1.25±0.02), body composition (CP%, 18.71±0.09; EE%, 3.29±0.07; ash%, 1.15±0.05 and moisture%, 76.84±0.07) and hematological parameters (RBCs ($3.56\pm0.07\times10^{6}mm^{-3}$), PLTs (67.80±0.08), WBCs ($7.95\pm0.12\times10^{3}mm^{-3}$), MCH (56.87±0.04 pg), PCV (27.51±0.56%), MCHC (38.46±0.08%), MCV (189.70±0.69 fl)) were observed in 40 mg/kg Fe_2O_3-NPs supplementation. All the experimental diets were significantly improved ($p<0.05$) in all the above parameters than control diet. In the present research, the recommended dosage of Fe_2O_3-NPs as dietary supplementation is 40 mg/kg for improving the growth traits, body composition and hematological indices. Hence, this study demonstrates the potential of NPs to improve the health of fish.

Keywords: Nanoparticle; growth performance; carcass; hematology; *C. carpio*

STABILIZATION OF SEMI-LINEAR SYSTEMS ON A HILBERT STATE SPACE

Ayoub CHEDDOUR

University of Sidi Mohamed Ben Abdellah-USMBA, Fes, FP Taza, Department of mathematics, B.P. 1223, Taza, Morocco, LSI Laboratory

Abdelhai EL AZZOUZI

University of Sidi Mohamed Ben Abdellah-USMBA, Fes, FP Taza, Department of mathematics, B.P. 1223, Taza, Morocco, LSI Laboratory

ABSTRACT

The multi-delays system has been studied by many researchers using several methods and approaches such as the Lyapunov method, for more details on this subject, we refer to [3,4] and references therein. This class of equations are initiated in control theory due to their simple forms and also to their applicability in many and different real-life problems such as biology, economics, engineering, chemistry, for more details about this subject the reader can see for example [5] and references therein. In this paper we investigate the stability for a semi-linear systems with discrete multi-delays on a Hilbert state space. Firstly, we discuss the well possedness of mild solutions of the considered systems. Secondly, some sufficient conditions are given to guarantee the feedback stabilization for the semi-linear systems. The stabilization results are given in term of observation estimates. At the end, examples with numerical simulations are given to show the applicability of our theoretical results.

CORRELATION OF ULTRASOUND PARAMETERS BY PRINCIPAL COMPONENT ANALYSIS (PCA)

Mourad DERRA

Pr., Faculty of Applied Sciences, Ibn Zohr University, Agadir, Morroco

ABSTRACT

Ultrasonic inspection is a non-destructive testing method that relies on the phenomenon of reflection and transmission of acoustic waves during their propagation. In our study, we use Principal Component Analysis (PCA) as a statistical method to analyze and visualize a dataset containing individuals described by several quantitative variables that we have by non-destructive testing (NDT), which allows us to explore multivariate data (data with several variables). Our goal in this study is to reduce the dimensions of a multivariate data to two or three principal components, which can be visualized graphically, while losing as little information as possible.

Detecting the percentage of moisture in a specific liquid (in this case we treated milk), can be done using non-destructive testing and based on the results obtained by adopting the PCA method. Indeed, the percentage of humidity being inversely proportional to both the ultrasonic speed, the acoustic impedance and a the density, but of different degrees. This allows us to extract a lot of useful information from a simple statistical study.

Keywords : Principal Component Analysis (PCA), Ultrasound Parameters, Control Non Destructive

PRODUCTION OF ORNAMENTAL PLANTS USING EARTHWORM-BASED ORGANIC FERTILIZER (VERMICOMPOST) CONTAINING BACTERIA: SUSTAINABLE AGRICULTURE PRACTICES

Saiqa ANDLEEB

Microbial Biotechnology and Vermitechnology Laboratory, Department of Zoology, University of Azad Jammu and Kashmir, Muzaffarabad, 13100, Pakistan

Iram LİAQAT

Microbiology Laboratory, Department of Zoology, Government College University, Lahore, 54000, Pakistan

Irsa SHAFİQUE

Microbial Biotechnology and Vermitechnology Laboratory, Department of Zoology, University of Azad Jammu and Kashmir, Muzaffarabad, 13100, Pakistan

Shaukat ALİ

Microbiology Laboratory, Department of Zoology, Government College University, Lahore, 54000, Pakistan

ABSTRACT

Vermicomposting is an environmentally friendly, natural, and economic process to decompose organic waste. Various organic waste materials raw vegetables and fruits (pre-digested), wheat straw, rice straw, coconut peel, newspapers/wasted papers, eggshells, cow manure, dried grasses, and fresh spinach are converted into compost after 90 days/12 weeks via joint action of *Eisenia fetida* and microbes called vermicompost. Vermicompost is not only highly rich in NPK levels but also possesses beneficial bacteria (vermibacteria) having agricultural traits. An integrated management system (vermicompost and vermibacteria) were developed first time in Pakistan for the improvement of ornamental plants (marigold and pansy) production, as no work has been done before on the utilization of vermibacteria as microbial biofertilizer for the production of ornamental plants. The integrated management system not only increased the plant properties (height, root area, shoot, and root dry matter), but also improve the soil structure and properties (physical, chemical, and biological) with enhanced seed germination as well. Therefore, vermicompost could be used as a natural biofertilizer to increase the ornamental plant's production and for a sustainable horticulture system instead of inorganic fertilizer. Also costly chemical fertilizer input may also be reduced by applying vermicompost for the ornamental plant's production. In this chapter, vermicompost production using *Eisenia fetida*, the impact of various concentrations of vermicompost on the seed germination, seedling and vegetative growth parameters of marigold (*Tagetes erecta*) and pansy (*Viola x wittrokiana*), isolation and identification of vermibacteria from *Eisenia fetida* gut, characterization of vermibateria for plant growth promoting traits, their role in heavy metals remediation, and the impact of vermibacteria and vermicompost as an integrated management system on the growth and production of marigold (*Tagetes erecta*) and pansy (*Viola x wittrokiana*) are discussed.

Keywords: Vermicomposting, Marigold (*Tagetes erecta*) and Pansy (*Viola x wittrokiana*), soil health and fertility, plant growth promoting vermibacteria, integrated management system, *Eisenia fetida*

THE ROLE OF ARTIFICIAL INTELLIGENCE IN DISEASE DIAGNOSIS AND TREATMENT

Nishant K. SİNGH

Department of Mechanical Engineering, Harcourt Butler Technical University, Kanpur, UP, India

Yashvir SİNGH

Department of Mechanical Engineering, Graphic Era Deemed to be University, Dehradun, Uttarakhand, India

Virendar KUMAR

Department of Mechanical Engineering, Harcourt Butler Technical University, Kanpur, UP, India

Rajesh Kumar VERMA

Department of Mechanical Engineering, Harcourt Butler Technical University, Kanpur, UP, India

ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative technology with significant potential in various domains, including healthcare. In the field of disease diagnosis and treatment, AI has shown promise in revolutionizing the way healthcare professionals approach and manage patient care. This study explores the role of AI in disease diagnosis and treatment, highlighting its potential benefits, challenges, and future implications. AI algorithms have the ability to analyze vast amounts of medical data, including electronic health records, medical images, and genomic information, to identify patterns, detect anomalies, and make accurate predictions. Machine learning and deep learning techniques allow AI systems to learn from these data sets, improving their diagnostic accuracy over time. By leveraging AI technologies, healthcare providers can enhance early detection, streamline diagnoses, and enable personalized treatment plans tailored to individual patients. Furthermore, AI-based systems can assist physicians in making informed decisions by providing real-time clinical decision support. These systems can quickly process and interpret medical information, including symptoms, medical histories, and laboratory results, to generate diagnostic recommendations and treatment options. AI-powered tools such as chatbots and virtual assistants can also improve patient engagement, enabling timely communication and access to healthcare resources. While AI offers numerous opportunities, it also presents certain challenges. Ensuring the ethical use of AI in healthcare remains crucial, as issues of privacy, data security, and algorithmic bias need to be addressed. Additionally, integrating AI technologies into existing healthcare infrastructures and workflows requires careful planning and investment in infrastructure, training, and regulation.

Looking ahead, the future implications of AI in disease diagnosis and treatment are promising. As AI continues to evolve, it holds the potential to enhance precision medicine, accelerate drug discovery, and improve patient outcomes. Collaboration between healthcare professionals, researchers, and AI developers is essential to develop robust AI models, validate their performance, and ensure their seamless integration into clinical practice.

BIOLOGICAL TREATMENT AND SYSTEMATIC ANALYSIS OF WASTE WATER OF OIL AND INSTALLATIONS OF COMBINED OIL TREATMENT

Norboboeva Risolat BOTIROVNA

Tashkent State Pedagogical University named after Nizami, Natural sciences faculty, Biology and ecology department, Tashkent, Uzbekistan

ABSTRACT

The annual increase in the demand for the treatment of oil-layered, variously polluted wastewaters, which is generated from the daily needs of the city citizens and from oil factories, oil combines, and small enterprises, and requires the use of modern new technologies in wastewater treatment. In developed countries, the use of biological methods in wastewater treatment is a priority in the next decades.

Currently, there are several types of biological treatment of wastewater, and natural biological treatment facilities can include facilities for wastewater treatment through the soil (irrigation and filtration fields) and biological ponds. In natural conditions, the cleaning properties of local plants are used. For example, in small settlements and oil and gas enterprises with oil layers or oil and gas residues on the surface of the water, the technology of cleaning wastewater from oil production using peat biological ponds has been developed. This method is based on wastewater treatment, sorption of dirty particles in peat, uptake by plants and sedimentation of organic matter. The resulting sediment can then be used in land reclamation and in the establishment of ecozones in forestry. During evolution, plants have developed mechanisms that allow them to break down various chemical compounds. Aquatic plants release oxygen and participate in water aeration. This makes it possible for organic matter to be oxidized by bacteria, and the resulting compounds to be assimilated by bacteria and plants.

In some cases, the reduction of organic matter by macrophytes is higher than the purification in aerotanks. Information on methods of cleaning wastewater contaminated with oil and oil-oil products, pesticides, mineral fertilizers and herbicides, triphenylmethane dyes, aromatic and aliphatic amines, phenol and mercaptopyrims, heavy metal compounds, rhodanide and cyanide substances with the help of aquatic plants is presented in a number of scientific articles.

Depending on the growth and characteristics of aquatic plants, different devices are functionally different. The first group, which cleans wastewater and improves the condition of natural waters, includes botanical gardens, bioponds with tall aquatic plants and artificial swamps, and the second group includes phytofiltration equipment and various bioplateaus. The main difference between bioponds where aquatic plants are grown is the presence of an algobacterial complex in them. When aquatic plants are introduced into bioponds, additional mechanisms are used in wastewater treatment, such as the participation of plants in the periphyton in the mineralization process, ingestion and assimilation of various substances by aquatic plants, phyto- and bacterioplankton, the activity of various organisms in the rhizosphere, and others. In such a system, the amount of nitrogen, organic matter, oil and oil products, suspended particles and a number of other factors that reduce water quality are reduced. Various bioengineering infrastructure systems have been created in order to accelerate the cleaning properties of aquatic plants and organisms living in the same environment as well as chemical and biological complex treatment of wastewater. Phenology, distribution, morphology and productivity of high water plants - pistia (*Pistia stratiotes* L.), eichhornia *(Eichhornia crassipes* Solm), azolla (*Azolla coroliniana* Willd) and others, effectiveness and possibility of their use in biological treatment of domestic, industrial and agricultural wastewater described in detail in the scientific works of foreign researchers. Many scientists have introduced to the conditions of Uzbekistan, and today it can be seen that pistia, azolla, and eichhornia aquatic plants, which can be found in the water bodies of our country, are used in the biological treatment of wastewater. [1,2,3].

A number of scientific research works have been carried out on the issues of effective use and protection of water resources, as well as on the reproduction of bottom and high water plants growing in water bodies in the territory of our country, and their use in the national economy. [4].

Taking into account the opinions of the researchers mentioned above, our research on the biological treatment of oil-layered wastewater with the help of aquatic plants floating on the water surface was carried out in the complex-composed wastewater of "Yangiyol Yog-Moy" JSC (Azolla caroliniana Willd, Azollaceal) and Eichhornia (The composition of wastewater and its purification were monitored using *Eichornia crassipes Solms. Pontederiaceal*) plants. Waste water used in the oil production process of JSC "Yangiyol Yog-Moy" is a favorable environment for the growth of algae, fungi and aquatic plants, as well as for the development of various bacteria. Exchange of substances between different substances in water and living organisms takes place. This leads to the acceleration of aerobic processes in water.

According to the researchers, when polluted wastewater is treated in specially built facilities, when it is used together with algae, aquatic plants, the efficiency of water purification increases. In the process of re-purification of wastewater in the facilities of "Yangiyol Yog-Moy" JSC treatment plant with the help of high-water plants *Azolla* and *Eichhornia*, the process of biological purification of wastewater from various organic and mineral substances, as well as saprophytic and enteric bacteria, is accelerated, the number of enteric bacteria in the wastewater is accelerated. was observed to be reduced compared to the control at baseline and the water was clear and odorless. In this case, the amount of oxygen dissolved in the water in the initial wastewater is 2.18 mg O 2, the Biological consumption of oxygen is 13.20 mg O 2 /l, the amount of chemical consumption of oxygen is 7.88 mg O2 / l, the smell is hydrogen sulfide, the amount of H2S is 6.7 mg / l. If the pH is 8.22 (May 2020), the amount of dissolved oxygen in water in the process of growing aquatic plants in wastewater is 6.74 mg O 2 / l, the amount of KBS5 is 2.7 times, or Up to 5.67 mg O2/l, a 4.12-fold decrease in KKS or 9.76 mg O2/l was observed. In addition, it was observed that other biological, physical, chemical properties, smell, color of water changed, and the condition of water improved.

Compared to the initial situation, it was found that the amount of saprophytic and intestinal bacilli bacteria in the wastewater has decreased several times. It was observed that the amount of Escherichia coli bacteria decreased from 2.103 x/l to 1.101 or 200 times, and the total amount of saprophytic bacteria decreased from 7.104 x/l to 2.102 x/l or 350 times.

Thus, according to the results of our research conducted at the "Yangiyol Yog-Moy" JSC treatment plant, it was determined that it is possible to increase the amount of dissolved oxygen in wastewater, to accelerate the process of biological purification of wastewater from organo-mineral substances and saprophytic and enteric bacteria. Also, it was found that the sewage water of "Yangiyol Yog-Moy" JSC treatment plant serves as a partial nutrient medium for the gross reproduction of aquatic plants - Azolla, eichhornia and algae. "Yangiyo'l Yog'-Moy" JSC facility's wastewater, dark-gray colored collections floating on the surface, samples taken from "gulchas" and wastewater, when observed with the help of a microscope, mainly *O. limosa, O. tenius, O. bonneomaisonii, belonging to the genus Oscillatoria, O. princeps, O. bornetii, O. brevis, Microcystis pulverea f. consists of elechista and Dactylococcopsis rhaphidioides var. Falciformis. Diatom algae* belonging to the families *Cocconeis, Ntizschia Cymbella*, were found in the samples taken from thin layers of dark-brown color on the surface of the concrete and iron coverings. In addition, *Euglena caudata, E. viridis* and *Scenedesmus bijugatus, S. obliquus, S. opoliensis* species were found among green algae, although in small quantities. "Yangiyo'l Yog-Moy" JSC is gradually transferred from the clarifiers to wastewater biopools. During the monitoring of the growth and development of algae in the bioponds of JSC "Yangiyol Yog-Moy", 55 species were identified due to favorable conditions for them.

Out of them, 18 species belong to blue-green algae, 1 species to golden algae, 9 species to diatom algae, 2 species to euglena algae, and 25 species to green algae. Pandorina morum, *Chlorella vulgaris, Eudorina elegans* and *Chlamydomonas minima plankton* species were found. Along with these algae, dark-brown covers of diatoms *Nitzschia amphyoxys, N.acicularis, N.palea, Navicula cryptocephala, N. gracilis* grow under the water.

These algae grow well only in polluted waters. Mechanically treated wastewater to a certain extent goes to clarifiers. It was found that many algae are found in these clarifiers. Among them, most of the species belong to blue-green algae, there are less species of diatom algae, green algae and euglena algae species are the fewest. the growth of species was also observed. In addition to the softeners, the speed of the flow in the water conduits does not allow the water temperature to rise in the "Yangiyol Yog-Moy" JSC treatment plant. Therefore, it was noted that the number of species of algae growing in this part of the treatment plant and their quantity in the water is low.

Annotation: The article presents the experiments and their results for the purpose of biological treatment of the wastewater of the oil-oil processing plant with the help of aquatic plants, as well as information about the systematic analysis of the last and initial algae from the biological treatment of the wastewater of the oil-oil processing plant.

Keywords: protection, oil, combine, cleaning, installations, effluent, water, higher, water, plant, biological, cleaning, biopool, green algae, floristics.

ASSESSMENT OF THE NUMBER OF MICROORGANISMS IN SOIL SAMPLES CONTAMINATED WITH PESTICIDES

Konul GAHRAMANOVA

Ministry of Science and Education Institute of Additives of Chemistry named after acad. A.M.Kuliev, Baku, Azerbaijan

ORCID ID: 0000-0002-1391-5571

Aygun ALMAMMADOVA

Ministry of Science and Education Institute of Additives of Chemistry named after acad. A.M.Kuliev, Baku, Azerbaijan

ORCID ID: 0009-0007-3288-1710

Tarana IBRAGIMOVA

Ministry of Science and Education Institute of Additives of Chemistry named after acad. A.M.Kuliev, Baku, Azerbaijan

ORCID ID: 0009-0008-9276-3561

Gulzar MAMMADOVA

Ministry of Science and Education Institute of Additives of Chemistry named after acad. A.M.Kuliev, Baku, Azerbaijan

ORCID ID: 0009-0005-6588-1472

ABSTRACT

One of the urgent environmental problems of biotechnology is the solution of a set of problems associated with the rehabilitation of soils contaminated with xenobiotics. Soils are subjected to a particularly strong destructive effect due to the intensive use of pesticides in violation of the norms and rules for their use, which leads to their significant accumulation in soils. Landfills for unused or banned chemicals also pose a particular hazard. Natural processes of self-purification of soils are not able to cope with such volumes of pollution [1].

The study of the composition of microbiocenoses of contaminated soils, as well as soils from the territory of disposal of pesticides, is of considerable scientific interest, both for monitoring the environment and for isolating microorganisms that are resistant to high doses of toxicants [2]. Pesticides retained by the organic and colloidal parts of the soil significantly limit biological activity and inhibit nitrification processes, which are important for soil fertility [3].

The aim of the work was a microbiological study of the soil from the burial site of the pesticide 4,4-dichlorodiphenyltrichloroethane. Soil samples were taken at a distance of 10 and 20 cm from the pollution source.

In the course of our research, the effect of the pesticide 4,4-DDT on the number of microorganisms (bacteria and mold fungi) was studied. The total number of microorganisms was determined by the method of limiting dilutions and inoculation of the appropriate dilution (0.05 ml) on agar media: meat-peptone agar (MPA) for bacteria and wort agar (SA) for fungi and yeast. After the incubation of the crops, the grown colonies were counted quantitatively and the number of colony-forming units (CFU) per 1 g of soil was determined.

The results of microbiological analysis showed that the total content of microflora in soil contaminated with pesticides is lower than in the absence of pollution. Since, in samples No. 1 and No. 2, taken near the pesticide burial, the number of microorganisms is almost absent - 3-5 colonies in a Petri dish. And in samples No. 3 and No. 4, taken at a distance of 10-20 cm from the place of contamination, the number

of bacteria is 19·105 and 29·105 CFU/g, respectively. In all samples, the number of mold and yeast fungi does not exceed 2-5 colonies, while in uncontaminated soil the number of fungi is 43·104, and the number of bacteria is 84·107 CFU/g. It is likely that high concentrations of the pesticide have a toxic effect on the population of microorganisms. In addition, the absence of fungi in the soil suggests that 4,4-DDT inhibits soil fungi.

In the course of the work, 12 strains of bacteria of the dominant populations contained in the soil were isolated. These crops have been identified and will be studied for the possibility of using pesticides as the sole carbon source.

Keywords: microbial destruction, soil pollution with pesticides, biotechnology

PARTICLES MOTION THROUGH URINE FLOW DRIVEN BY ELECTROOSMOSIS

Daya RAM

Department of Mathematics, Malaviya National Institute of Technology Jaipur, Rajasthan - 302017, India

D. S. BHANDARİ

James Watt School of Engineering, University of Glasgow, G12 8LT, UK

Dharmendra TRİPATHİ

Department of Mathematics, National Institute of Technology Uttarakhand, Srinagar-246174, India

Kushal SHARMA

Department of Mathematics, Malaviya National Institute of Technology Jaipur, Rajasthan - 302017, India

ABSTRACT

Kidney stones are mineral aggregates inside the kidney that cause urinary tract infections and difficulties during urination. Urine flow through the ureter is also restricted due to solid mineral crystals in the bladder. Calcium oxalate (CaOx) stones are the most common type of kidney stone that consists of high levels of calcium, oxalate, and relatively little fluid. Therefore, the physical interpretation of stone in ureter is essential for understanding how the stone flow block the urine in the kidney. In the present study, giving the importance of flow phenomena in the transmission process, the fluid dynamic approach has been carried out and BBO equation is employed to investigate how electro-osmosis affects the motion of CaOx particles with diameter $d_p = 14.6\,\mu m$ and having the density ρ_p range $1.84 - 2.08\ 2080\ g/cm^3$. In addition, the effect of Escherichia coli bacterial particles on the transmission of urine flow through the ureter has also been observed in this model. Using the lubrication assumption, analytical solutions have been obtained for bacterial and stone particle motion. The graphical results show that backward motion of Escherichia coli bacterial bacteria was observed that may be high responsible for the urinary tract infection can. The large size of CaOx particle cover less trajectory which may affect the urine flow inside the ureter. However, the electroosmotic velocity increases the trajectory of the CaOx particle.

Keywords: Electroosmosis; peristalsis; CaOx & bacteria particles; urine flow; particle trajectory.

KHANNA'S UNIQUE DIVISION METHOD FOR CALCULATING THE CUBE ROOT OF ANY REAL NUMBER

Anupam KHANNA

Department of Mathematics, DAV College-Sadhaura, Yamunanagar, Haryana (INDIA)

ORCID NO: 0000-0003-2265-9271

ABSTRACT

In this work, a new approach to find the cube root of real numbers is discussed. This technique is based on the classic long division method as we usually use to find the square root of real numbers. Author applied this method to 'perfect cubes as well as non-perfect cubes (even to decimal numbers)' and got the accuracy in the answers. This approach is unique due to its working procedure which is explained in this paper. Method is discussed step-by-step for few examples with the help of figures. No comparable work is available in the existing literature.

Keywords: cube root, square root, perfect cubes, long division method

ALTIN MADENCİLİĞİNDE YIĞIN LİÇ ALANLARINDA YIKAMA İŞLEMİNİN UYGULANABİLİRLİĞİNİN DEĞERLENDİRİLMESİ

EVALUATION OF THE APPLICABILITY OF THE WASHING PROCESS IN HEAP LEACHING AREAS IN GOLD MINING

Selahattin GÜNEY

Öğrenci, Erciyes Üniversitesi Fen Bilimleri Enstitüsü Kayseri, Türkiye

ORCID ID: 0000-0003-4628-3352

Şükrü Taner AZGIN

Doç. Dr., Erciyes Üniversitesi Mühendislik Fakültesi Çevre Mühendisliği Bölümü, Kayseri, Türkiye

ORCID ID: 0000-0002-1838-6285

ÖZET

Bu çalışmada, yığın liç alanlarının rehabilitasyonunda yeraltı suyu ile yıkama yaklaşımının uygunluğu, yığın liç yöntemi (içerisinde belli derişimlerde sodyum siyanür kimyasalı bulunan çözeltinin taban geçirimsizliği sağlanmış alanlara serilen cevher ile temasının sağlanması suretiyle altının çözünerek solüsyon içerisine alınmasıdır) ile altın madenciliği faaliyetini aktif bir şekilde gerçekleştiren bir işletmenin yığın liç alanından işlenmiş cevher atığı alınıp, alınan numunelerin kolon testine tabi tutulması suretiyle değerlendirilmiştir. Yığın liç alanında toplam 3 bölgeden numune alınmıştır. 1 nolu numune; liç işlemleri en erken biten bölgeden, 2 nolu numune; liç işlemleri en geç biten bölgeden alınmıştır. Yığın liç alanında bulunan bütün yığının temsil edilmesi amacı ile 1 ve 2 nolu numune eşit miktarlarda karıştırılarak homojen bir numune elde edilmiş ve elde edilen numune 3 nolu numune olarak isimlendirilmiştir. 1 ve 2 nolu numuneler, 1 ve 2 nolu kolonlara, 3 nolu numune ise 3 nolu kolona ve 4 nolu kolona beslenmiştir. Her bir kolona beslenen numune miktarı 40 kg olarak ayarlanmıştır. 1, 2 ve 3 nolu kolon yıkama suyu olarak, bölgede bulunan yeraltı suyu kullanılmış, 4 nolu kolon yıkama suyu olarak ise saf su kullanılmıştır. Her bir kolon, 10 L/m^2.saat debi ile yıkanmıştır. Kolonların tabanlarından süzülen yıkama suyu numunelerinde, günlük olarak toplam siyanür analizleri gerçekleştirilmiştir. Kolon tabanlarında biriken yıkama suyu numunelerinde okunan toplam CN değerleri; 1 nolu kolon için 19. Gün sonunda, 2 nolu kolon için 42. gün sonunda, 3 nolu kolon için 46. Gün sonunda <0,1 ppm değerine ulaşmıştır. 4 nolu kolon ise bölgeye düşen toplam 5 yıllık yağış miktarı baz alınarak hesaplanan yıkama suyu miktarına ulaşıncaya kadar saf su ile yıkama işlemine tabi tutulmuş ve 5,5 günlük yıkama işlemi sonunda elde edilen yıkama suyu numunesine ait toplam siyanür değeri 0,44 ppm olarak ölçülmüştür. Yıkamalara başladıktan sonra ilk 5 gün içerisinde, bütün kolon tabanlarından süzülen yıkama suyu numunelerinde toplam CN değeri 1 ppm altına düşmüştür. Yığın liç alanının bölgeye düşen yağışlar baz alınarak doğal olarak yıkanması senaryosuna göre toplam CN değerlerindeki değişimin ortaya konulmasının amaçlandığı 4 nolu kolonun saf su ile yıkanması işleminde, toplanan numunelerdeki toplam CN değerinin hızlı bir şekilde düştüğü tespit edilmiştir (3 günlük yıkama işlemi neticesinde toplam CN değeri <1 ppm'e düşmüştür). Elde edilen sonuçlar irdelendiğinde, yığın liç alanlarının yeraltından çekilen sular ile yıkanarak toplam CN değerinin <0,1 ppm altına düşürülebileceği ancak bu yaklaşımın yığın liç alanlarından depolanan işlenmiş cevher atıkları toplam miktarı dikkate alındığında, sürdürülebilir kaynakların kullanımı ve toplam yıkama süreleri açısından çok çevreci bir yaklaşım olmadığı sonucuna ulaşılmıştır. 4 nolu kolon yıkama testi sonuçları dikkate alındığında, yıkama işleminin doğal meteorolojik şartlar altında uzun yıllar içerisinde kontrollü bir şekilde yapılması halinde, liç alanlarındaki toplam CN değerinin doğal olarak istenen değerlere düşebileceği görülmüştür. Doğal yıkama işlemleri ardından, liç alanlarının yüzey geçirimsizliklerinin tekniğine uygun şekilde inşa edilmesi ve alan yüzeylerinin bölge iklimine uygun fidanlar ile ağaçlandırılarak alanın rehabilite edilmesi ve liç alanı etrafında bulunan su kalitesinin belli periyotlarda takip edilmesi ile etkin bir kapama dönemi ve kapama sonrası izleme dönemi tesis edilebilir.

Anahtar kelimeler: Altın Madenciliği, Yığın Liç Alanı, Cevher Atığı, Kolon Testi

ABSTRACT

In this thesis, the suitability of the groundwater leaching approach in the rehabilitation of heap leach areas was evaluated by taking the processed ore waste from the heap leach area of an enterprise and subjecting the samples to the column test (the inclusion of gold into the solution by dissolving the solution containing certain concentrations of sodium cyanide chemical by providing contact with the ore laid on the areas with base impermeability). Samples were taken from a total of three regions in the heap leach area. Sample No. 1 was taken from the region where leaching processes were completed the earliest. Sample No. 2 was taken from the region where the leaching process was completed at the latest. In order to represent the whole heap in the heap leaching area, samples 1 and 2 were mixed in equal amounts to obtain a homogeneous sample, and the obtained sample was named sample 3. Samples 1 and 2 were fed to columns 1 and 2, and sample 3 was fed to columns 3 and 4. The amount of sample fed to each column was set to 40 kg. Groundwater in the region was used as column washing water numbered 1, 2, and 3, and pure water was used as column washing water numbered 4. Each column was washed at a flow rate of 10 L/m2.hr. Daily total cyanide analyses were performed on wash water samples filtered from the bottom of the columns. Total CN values read in wash water samples accumulated at the bottom of the column; They reached <0.1 ppm at the end of the 19th day for column 1, at the end of the 42nd day for column 2, and at the end of the 46th day for column 3. Column number 4 was washed with pure water until it reached the amount of washing water calculated based on the total amount of precipitation for 5 years in the region, and the total cyanide value of the washing water sample obtained at the end of the 5.5-day washing process was measured as 0.44 ppm. Within the first 5 days after starting the washings, the total CN value in the wash water samples filtered from all the column bases decreased below 1 ppm. According to the scenario where the heap leaching area is naturally washed out based on the rainfall in the region, it was determined that the total CN value in the samples collected after column 4 was washed with pure water decreased rapidly (as a result of the 3-day washing process, the total CN value decreased to <1 ppm) When the results obtained were examined, it was seen that the total CN value could be reduced to <0.1 ppm by washing the heap leach areas with the water withdrawn from the ground. However, considering the total amount of processed ore waste stored in heap leaching areas, it has been concluded that this approach is not very environmentally friendly in terms of the use of sustainable resources and total washing times. Considering the results of column washing test number 4, it has been observed that the total CN value in the leaching areas can naturally decrease to the desired values if the washing process is carried out in a controlled manner over many years under natural meteorological conditions. After the natural washing processes, an effective closure period and post-closure monitoring period can be established by constructing the surface impermeability of the leaching areas in accordance with the technique, rehabilitating the area by afforesting the area surfaces with saplings suitable for the climate of the region, and monitoring the water quality around the leaching area at certain intervals.

Keywords: Gold Mining, Heap Leaching, Ore Waste, Column Testing

THE SENSORY EFFECT OF CINNAMON

Mebarki Amani HAYAT

Laboratory of Physiology of Nutrition and Food Security, University Ahmed Ben Bella Oran1

Benaissa YAMİNA

Laboratory of Physiology of Nutrition and Food Security, University Ahmed Ben Bella Oran1

Histology-Embryology and Genetics Department, Faculty of Medicine Oran1

Addou SAMİA

Laboratory of Physiology of Nutrition and Food Security, University Ahmed Ben Bella Oran1

ABSTRACT

Cinnamon is the bark extracted from the small tree called cinnamon, planted mainly in countries of South Asia or the Middle East such as India or China. With its unique smell and taste that adds gluttony to our recipes, we almost forget that it is above all an excellent health ally.

According to a study by the American Journal Of Clinical Nutrition published in 2006, cinnamon is ranked among the 50 most antioxidant and anti-inflammatory foods, calms heartburn, cinnamon has antibacterial, anti-virus, anti-inflammatory properties. parasites and antiseptics. All of these features reduce intestinal flora infections. Its virtues help our body to fight against digestion problems and reduce nausea.

The objective of this study is to evaluate the organoleptic qualities of cinnamon powder. We carried out an experiment which was submitted to a panel of 60 tasters. Three parameters were appreciated by the latter. It was for them to appreciate: the taste, the smell, the color.

Our result shows that the tasting by a panel revealed that the cinnamon powder is not too sweet (bitter), that its smell is pleasant, but that the dark brown color is unpleasant.

Keywords: cinnamon powder, tasters, Vietnamese cinnamon, dark brown color, bitter, smell is pleasant.

INVESTIGATION OF CHANGE IN THE RADIATION ARMOR PROPERTIES OF COLEMANITE REINFORCED POLY (METHYL METHACRYLATE) BUILDING EXPOSED TO SPACE RADIATION

Atilla Volga ŞENGÜL

Istanbul Technical University, Graduate School of Radiation Science and Technology, Ayazaga Campus, İstanbul, Türkiye

Nilgun BAYDOGAN

Istanbul Technical University, Energy Institute, Ayazaga Campus, 34469, Istanbul, Türkiye

ABSTRACT

Poly (methyl methacrylate) (PMMA), a thermoplastic material exhibiting high resistivity, is characterized as such.

Resistant to wear and high temperatures. The polymer known as polymethyl methacrylate (PMMA) is notable for exhibiting exceptional properties with respect to thermal stability, mechanical strength, and radiation resistance.

The shielding capabilities may be enhanced through the incorporation of colemanite filler.

The PMMA material possesses exceptional structural features that enhance its suitability for a range of applications. Additionally, incorporating additives, such as colemanite, further strengthens its performance properties. The application of PMMA utilized by modern industries such as bioengineering, aviation and aerospace. Their exceptional thermal conductivity attributes make them potentially beneficial for diverse uses.

The utilization of this material presents substantial merits in terms of enhanced durability and exceptional strength.

PMMA is a thermoplastic polymer material belonging to the acrylate family, characterized by its transparent properties. The incorporation of colemanite filler in PMMA composites holds vast importance in various fields of use.

The Atom Transfer Radical Polymerization (ATRP) is a ground-breaking polymerization process that has attracted considerable attention in the scientific community.

The ATRP technique was employed to facilitate the homogenous incorporation of colemanite filler into a PMMA matrix, in the present study.

Colemanite is frequently utilized as a primary source of boron, a vital micronutrient essential for plant growth and development, as well as a key ingredient in the production of a diverse range of commodities such as glass, ceramics, and detergents. Furthermore, it serves as a means of inhibiting combustion and acts as a constituent in the manufacturing of fiberglass and various other composite materials.

Research investigation Colemanite was employed as a means of augmenting the radiation shielding characteristics of polymethyl methacrylate (PMMA).

The current study employed gamma transmission techniques to analyze the response of PMMA/Colemanite composite specimens under irradiation. The isotope Co-60 was employed as a gamma radiation source.

In the present study, composite samples consisting of Poly(methyl methacrylate) (PMMA) and Colemanite were synthesized at varying concentrations of the latter. The resulting samples were irradiated for a predetermined duration and subsequently subjected to the determination of their linear attenuation coefficient values with respect to the Co-60 radioisotope. The findings of this study suggest that an increase in colemanite concentration led to a gradual increase in attenuation coefficients. The

present study suggests that the incorporation of colemanite as a filler, could potentially enhance the radiation shielding efficacy of PMMA-based polymers.

Keywords: Atom transfer radical polymerization, Poly (methyl methacrylate), Collemanite, Reinforcement, Composite, Co-60 radioisotope, Radiation shielding

ÖZET

Polimer teknolojisi fiziksel, kimyasal ve yapısal özelliklerinden dolayı kimya sanayi, mühendislik ve biyomedikal uygulamalar ve karasal haberleşme alanları gibi geniş kullanım alanlarına sahiptir.

Zırhlama yetenekleri, kolemanit dolgu maddesinin dahil edilmesi yoluyla geliştirilebilir.

PMMA malzemesi, bir dizi uygulama için uygunluğunu artıran olağanüstü yapısal özelliklere sahiptir. Ek olarak, kolemanit gibi katkı maddelerinin dahil edilmesi, performans özelliklerini daha da güçlendirir. Biyomühendislik, havacılık ve uzay gibi modern endüstriler tarafından kullanılan PMMA uygulaması. Olağanüstü termal iletkenlik özellikleri, onları çeşitli kullanımlar için potansiyel olarak faydalı kılar.

Bu malzemenin kullanımı, geliştirilmiş dayanıklılık ve olağanüstü güç açısından önemli avantajlar sunar.

PMMA, şeffaf özellikleri ile karakterize edilen, akrilat ailesine ait bir termoplastik polimer malzemedir. Kolemanit dolgu maddesinin PMMA kompozitlerine dahil edilmesi, çeşitli kullanım alanlarında büyük önem taşımaktadır.

Atom Transfer Radikal Polimerizasyonu (ATRP), bilim camiasında büyük ilgi gören çığır açan bir polimerizasyon işlemidir.

Bu çalışmada, kolemanit dolgu maddesinin bir PMMA matrisine homojen bir şekilde dahil edilmesini kolaylaştırmak için ATRP tekniği kullanılmıştır.

Kolemanit sıklıkla, bitki büyümesi ve gelişmesi için gerekli olan hayati bir mikro besin maddesi olan borun birincil kaynağı ve cam, seramik ve deterjanlar gibi çok çeşitli malların üretiminde önemli bir bileşen olarak sıklıkla kullanılır. Ayrıca, yanmayı önlemenin bir aracı olarak hizmet eder ve cam elyafı ile diğer çeşitli kompozit malzemelerin imalatında bir bileşen olarak işlev görür.

Araştırma araştırması Kolemanit, polimetil metakrilatın (PMMA) radyasyon koruma özelliklerini artırmanın bir yolu olarak kullanıldı.

Mevcut çalışma, ışınlama altındaki PMMA/Colemanite kompozit numunelerinin tepkisini analiz etmek için gama iletim teknikleri kullanmıştır. İzotop Co-60, bir gama radyasyon kaynağı olarak kullanıldı.

Bu çalışmada, Poli(metil metakrilat) (PMMA) ve Kolemanitten oluşan kompozit numuneler, sonrakinin değişen konsantrasyonlarında sentezlendi. Ortaya çıkan numuneler, önceden belirlenmiş bir süre boyunca ışınlandı ve ardından Co-60 radyoizotopuna göre doğrusal zayıflama katsayısı değerlerinin belirlenmesine tabi tutuldu. Bu çalışmanın bulguları, kolemanit konsantrasyonundaki bir artışın, atenüasyon katsayılarında kademeli bir artışa yol açtığını göstermektedir. Mevcut çalışma, kolemanitin bir dolgu maddesi olarak dahil edilmesinin, PMMA bazlı polimerlerin radyasyon koruma etkinliğini potansiyel olarak artırabileceğini öne sürmektedir.

Anahtar kelimeler: Atom transfer radikal polimerizasyonu, Poli(metil metakrilat), Kolemanit, Takviye malzeme, Kompozit, Co-60 radyoizotop, Radyasyon koruma

2-PHENYL-3-BUTYN-2-OL SYNTHESIS BASED ON ACETYLENE AND METHYL PHENYL KETONE

Yusupova Lola AZIMOVNA

DSc, Professor, Tashkent Chemical -Technological Institute, Uzbekistan, Tashkent

ORCID ID: 486420309

ABSTRACT

In this article, copper-bismuth-nickel-kaolin (MVNK), copper-bismuth-cobalt-kaolin (MVKK), copper-bismuth-nickel-bentonite (MVNB), copper-bismuth- cobalt-bentonite (MVKB), copper-bismuth-nickel-zeolite (MVNS), copper-bismuth-cobalt-zeolite (MVKS), copper-bismuth-nickel-silica gel (MVNS) and copper-bismuth-cobalt-silica gel (MVKS) synthesis of 2-phenyl-3-butyn-2-ol was studied in the presence of catalysts. Also, the influence of the nature of catalysts, temperature, and the mole ratio of starting materials on product yield was determined. An alternative process condition has been found.

Keywords: acetylene, methyl phenyl ketone, 2-phenyl-3-butyn-2-ol, heterogeneous-catalytic, catalyst

BIOLOGICAL TREATMENT AND SYSTEMATIC ANALYSIS OF WASTE WATER OF OIL AND INSTALLATIONS OF COMBINED OIL TREATMENT

Norboboeva Risolat BOTIROVNA

Tashkent State Pedagogical University named after Nizami, Natural sciences faculty, Biology and ecology department, Tashkent, Uzbekistan

The annual increase in the demand for the treatment of oil-layered, variously polluted wastewaters, which is generated from the daily needs of the city citizens and from oil factories, oil combines, and small enterprises, and requires the use of modern new technologies in wastewater treatment. In developed countries, the use of biological methods in wastewater treatment is a priority in the next decades.

Currently, there are several types of biological treatment of wastewater, and natural biological treatment facilities can include facilities for wastewater treatment through the soil (irrigation and filtration fields) and biological ponds. In natural conditions, the cleaning properties of local plants are used. For example, in small settlements and oil and gas enterprises with oil layers or oil and gas residues on the surface of the water, the technology of cleaning wastewater from oil production using peat biological ponds has been developed. This method is based on wastewater treatment, sorption of dirty particles in peat, uptake by plants and sedimentation of organic matter. The resulting sediment can then be used in land reclamation and in the establishment of ecozones in forestry. During evolution, plants have developed mechanisms that allow them to break down various chemical compounds. Aquatic plants release oxygen and participate in water aeration. This makes it possible for organic matter to be oxidized by bacteria, and the resulting compounds to be assimilated by bacteria and plants.

In some cases, the reduction of organic matter by macrophytes is higher than the purification in aerotanks. Information on methods of cleaning wastewater contaminated with oil and oil-oil products, pesticides, mineral fertilizers and herbicides, triphenylmethane dyes, aromatic and aliphatic amines, phenol and mercaptopyrims, heavy metal compounds, rhodanide and cyanide substances with the help of aquatic plants is presented in a number of scientific articles.

Depending on the growth and characteristics of aquatic plants, different devices are functionally different. The first group, which cleans wastewater and improves the condition of natural waters, includes botanical gardens, bioponds with tall aquatic plants and artificial swamps, and the second group includes phytofiltration equipment and various bioplateaus. The main difference between bioponds where aquatic plants are grown is the presence of an algobacterial complex in them. When aquatic plants are introduced into bioponds, additional mechanisms are used in wastewater treatment, such as the participation of plants in the periphyton in the mineralization process, ingestion and assimilation of various substances by aquatic plants, phyto- and bacterioplankton, the activity of various organisms in the rhizosphere, and others. In such a system, the amount of nitrogen, organic matter, oil and oil products, suspended particles and a number of other factors that reduce water quality are reduced. Various bioengineering infrastructure systems have been created in order to accelerate the cleaning properties of aquatic plants and organisms living in the same environment as well as chemical and biological complex treatment of wastewater. Phenology, distribution, morphology and productivity of high water plants - pistia (*Pistia stratiotes* L.), eichhornia *(Eichhornia crassipes* Solm), azolla (*Azolla coroliniana* Willd) and others, effectiveness and possibility of their use in biological treatment of domestic, industrial and agricultural wastewater described in detail in the scientific works of foreign researchers. Many scientists have introduced to the conditions of Uzbekistan, and today it can be seen that pistia, azolla, and eichhornia aquatic plants, which can be found in the water bodies of our country, are used in the biological treatment of wastewater. [1,2,3].

A number of scientific research works have been carried out on the issues of effective use and protection of water resources, as well as on the reproduction of bottom and high water plants growing in water bodies in the territory of our country, and their use in the national economy. [4].

Taking into account the opinions of the researchers mentioned above, our research on the biological treatment of oil-layered wastewater with the help of aquatic plants floating on the water surface was carried out in the complex-composed wastewater of "Yangiyol Yog-Moy" JSC (Azolla caroliniana Willd, Azollaceal) and Eichhornia (The composition of wastewater and its purification were monitored using *Eichornia crassipes Solms. Pontederiaceal*) plants. Waste water used in the oil production process of JSC "Yangiyol Yog-Moy" is a favorable environment for the growth of algae, fungi and aquatic plants, as well as for the development of various bacteria. Exchange of substances between different substances in water and living organisms takes place. This leads to the acceleration of aerobic processes in water.

According to the researchers, when polluted wastewater is treated in specially built facilities, when it is used together with algae, aquatic plants, the efficiency of water purification increases. In the process of re-purification of wastewater in the facilities of "Yangiyol Yog-Moy" JSC treatment plant with the help of high-water plants *Azolla* and *Eichhornia*, the process of biological purification of wastewater from various organic and mineral substances, as well as saprophytic and enteric bacteria, is accelerated, the number of enteric bacteria in the wastewater is accelerated. was observed to be reduced compared to the control at baseline and the water was clear and odorless. In this case, the amount of oxygen dissolved in the water in the initial wastewater is 2.18 mg O 2, the Biological consumption of oxygen is 13.20 mg O 2 /l, the amount of chemical consumption of oxygen is 7.88 mg O2 / l, the smell is hydrogen sulfide, the amount of H2S is 6.7 mg / l. If the pH is 8.22 (May 2020), the amount of dissolved oxygen in water in the process of growing aquatic plants in wastewater is 6.74 mg O 2 / l, the amount of KBS5 is 2.7 times, or Up to 5.67 mg O2/l, a 4.12-fold decrease in KKS or 9.76 mg O2/l was observed. In addition, it was observed that other biological, physical, chemical properties, smell, color of water changed, and the condition of water improved.

Compared to the initial situation, it was found that the amount of saprophytic and intestinal bacilli bacteria in the wastewater has decreased several times. It was observed that the amount of Escherichia coli bacteria decreased from 2.103 x/l to 1.101 or 200 times, and the total amount of saprophytic bacteria decreased from 7.104 x/l to 2.102 x/l or 350 times.

Thus, according to the results of our research conducted at the "Yangiyol Yog-Moy" JSC treatment plant, it was determined that it is possible to increase the amount of dissolved oxygen in wastewater, to accelerate the process of biological purification of wastewater from organo-mineral substances and saprophytic and enteric bacteria. Also, it was found that the sewage water of "Yangiyol Yog-Moy" JSC treatment plant serves as a partial nutrient medium for the gross reproduction of aquatic plants - Azolla, eichhornia and algae. "Yangiyo'l Yog'-Moy" JSC facility's wastewater, dark-gray colored collections floating on the surface, samples taken from "gulchas" and wastewater, when observed with the help of a microscope, mainly *O. limosa, O. tenius, O. bonneomaisonii, belonging to the genus Oscillatoria, O. princeps, O. bornetii, O. brevis, Microcystis pulverea f. consists of elechista and Dactylococcopsis rhaphidioides var. Falciformis. Diatom algae* belonging to the families *Cocconeis, Ntizschia Cymbella*, were found in the samples taken from thin layers of dark-brown color on the surface of the concrete and iron coverings. In addition, *Euglena caudata, E. viridis* and *Scenedesmus bijugatus, S. obliquus, S. opoliensis* species were found among green algae, although in small quantities. "Yangiyo'l Yog-Moy" JSC is gradually transferred from the clarifiers to wastewater biopools. During the monitoring of the growth and development of algae in the bioponds of JSC "Yangiyol Yog-Moy", 55 species were identified due to favorable conditions for them.

Out of them, 18 species belong to blue-green algae, 1 species to golden algae, 9 species to diatom algae, 2 species to euglena algae, and 25 species to green algae. Pandorina morum, *Chlorella vulgaris, Eudorina elegans* and *Chlamydomonas minima plankton* species were found. Along with these algae, dark-brown covers of diatoms *Nitzschia amphyoxys, N.acicularis, N.palea, Navicula cryptocephala, N. gracilis* grow under the water.

These algae grow well only in polluted waters. Mechanically treated wastewater to a certain extent goes to clarifiers. It was found that many algae are found in these clarifiers. Among them, most of the species belong to blue-green algae, there are less species of diatom algae, green algae and euglena algae species are the fewest. the growth of species was also observed. In addition to the softeners, the speed of the

flow in the water conduits does not allow the water temperature to rise in the "Yangiyol Yog-Moy" JSC treatment plant. Therefore, it was noted that the number of species of algae growing in this part of the treatment plant and their quantity in the water is low.

Annotation: The article presents the experiments and their results for the purpose of biological treatment of the wastewater of the oil-oil processing plant with the help of aquatic plants, as well as information about the systematic analysis of the last and initial algae from the biological treatment of the wastewater of the oil-oil processing plant.

Keywords: protection, oil, combine, cleaning, installations, effluent, water, higher, water, plant, biological, cleaning, biopool, green algae, floristics.

O`ZBEKISTON MINERAL XOMASHYOSIDAN VA SANOAT CHIQINDILARIDAN SHISHASIMON MATERIALLAR OLISH

OBTAINING GLASSY MATERIALS FROM MINERAL RAW MATERIALS OF UZBEKISTAN AND INDUSTRIAL WASTE

TUKHTAMUSHOVA A.U.

Tashkent Institute of Chemical Technology, Faculty of Technology of Inorganic Compounds, Department of "General Chemistry", Tashkent, Uzbekistan

ORCID ID: 0000-0001-6542-1699

YUNUSOV M.Yu.

Tashkent Institute of Chemical Technology, Faculty of Technology of Winemaking and Industrial Viticulture, Department of "Industrial Ecology", Tashkent, Uzbekistan

ORCID ID: 0000-0002-2231-2334

ABSTRACT

This paper discusses the possibilities of using the mineral raw materials of Uzbekistan and industrial waste in order to use them in the production of building materials. Currently, in the context of climate change, as well as rapid industrialization and population growth, there are interrelated problems and needs in order to ensure an efficient, resource-saving and environmentally friendly economy. the need is increasing more and more. According to the information presented in the scientific and technical literature, only 2% of natural materials are involved in production according to scientific research analysis, and the rest are waste. The types of industrial waste include the part that remains after the extraction of multicomponent natural raw materials and the production of the target product from it, for example, loose ore rock, rocks formed in the upper part of the mine working, ash and slag from thermal power engineering. vegetable, slags formed during metalworking, scrap metal of mechanical engineering enterprises (shavings), liquid, solid, gaseous residues formed in the production of products of the chemical industry, forestry, woodworking, light and other industries, road construction industry, agro-industry. industry, etc. The efficient use of industrial waste requires taking into account a number of factors, including what substances they contain, the state of aggregation of the substance (gaseous, liquid, solid), the volume of formation, technological characteristics, etc. The most optimal technological solution is the use of waste-free technologies in production. It is important to radically change technological processes, create systems that include closed cycles, and create the possibility of multiple reuse of raw materials. Most of the materials used as raw materials in the production of building materials are of the mineral type. Depending on what chemical compounds are in the waste, they are divided into such types as silicate, carbonate, lime, iron-containing, gypsum, alkali-containing, zinc-containing. Valuable components in the composition of raw materials and industrial wastes, suitable for the synthesis of glassy systems, made it possible to obtain glasses and glass-ceramic materials based on them with improved properties

Keywords: Glassy State, minerals, Industrial Waste

ABSTRACT

Ushbu maqolada O‘zbekiston mineral xomashyosi va sanoat chiqindilaridan qurilish materiallari ishlab chiqarishda foydalanish imkoniyatlari ko‘rib chiqiladi. Hozirgi vaqtda iqlim o‘zgarishi, shuningdek, jadal sanoatlashtirish va aholi sonining o‘sishi sharoitida o‘zaro bog‘liq bo‘lgan mavjud muammolar va ehtiyojlar sharoitida samarali, resurslarni tejovchi va ekologik toza iqtisodiyotni ta’minlash maqsadida iqtisodiyot tarmoqlarining zarur resurslarga bo‘lgan ehtiyoji tobora ortib bormoqda. Ilmiy-texnik adabiyotlarda keltirilgan ma’lumotlarga ko‘ra ilmiy tadqiqot tahlillariga muvofiq faqat 2% miqdorda

tabiiy materiallar ishlab chiqarishga jalb etiladi, qolganlari esa chiqindi holatda bo‘ladi. Sanoat chiqindilari turlariga ko‘p komponentli xom-ashyoni qazib olib undan kerakli mahsulotni olgandan so‘ng qoladigan qismi, masalan bo‘sh ruda jinsi, tog‘jinsini qazib olishda ustki qismida hosil bo‘ladigan jinslar, issiqlik elektr stansiyalari kuli va shlaki, metal ishlab chiqarishda hosil bo‘ladigan shlaklar, mashina sanoati korxonalari metal qoldiqlari (qirindi), kimyo sanoati maxsulotlari olishda hosil bo‘ladigan suyuq, qattiq, gazsimon qoldiqlar, o‘rmon, yog‘ochni qayta ishlash, yengil va boshqa sanoat sohalari, yo‘l-qurilish industriyasi, agrosanoat va h.k.. Sanoat chiqindilaridan unumli foydalanish bir qator omillarni inobatga olishni talab etadi, jumladan ular tarkibida qanday moddalar borligi, moddalarni agregat holati (gaz, suyuq, qattiq), hosil bo‘layotgan miqdori, texnologik o‘ziga xos xususiyatlari va h.k.. Eng maqbul texnologik yechim bu chiqindi hosil qilmaydigan texnologiyalarni ishlab-chiqarishga tadbiq etilishi hisoblanadi. Bunda texnologik jarayonlarni tubdan o‘zgartirish, yopiq sikllarni o‘z ichiga olgan tizimlarni yaratish, xom – ashyoni bir necha marta qayta ishlatish imkonini yaratish muhim hisoblanadi. Qurilish materiallari ishlab chiqarishda xom-ashyo sifatida ishlatiladigan materiallardan eng ko‘pi bu mineral xom-ashyo turiga to‘g‘ri keladi. Chiqindi tarkibida qanday kimyoviy birikmalar borligiga qarab – silikat, karbonat, ohakli, temirli, gipsli, tarkibida ishqori bor, tarkibida sinki bor kabi turlarga bo‘linadi.

Xom ashyo va sanoat chiqindilari tarkibidagi shishasimon tizimlarni sintez qilish uchun mos bo'lgan qimmatbaho komponentlar ular asosida yaxshilangan xususiyatlarga ega shishalar va shisha-keramika materiallarini olish imkonini berdi.

Keywords: Shishasimon holat, mineral xom-ashyo, sanoat chiqindilari

A NOVEL TOOL TO ENABLE VISUALLY IMPAIRED USERS TO USE THE INTERNET FOR THEIR INVESTMENTS

Ferdi SARAC

Suleyman Demirel University Computer Engineering Department, Isparta, Türkiye

ORCID ID: 0000-0002-7080-1634

ABSTRACT

At present times, the Internet is not only the primary source of information, but also a fundamental resource for investing. The Stoke market and crypto-based technologies are constantly growing internet-based investment areas. However, these investment tools are not accessible on the internet for low vision or visually impaired individuals. Moreover, even if these applications become accessible, graphs showing real-time and historical data of currencies that will enable investors to decide which stock or cryptocurrency to invest in are not accessible to people with visual impairments. In this study, therefore, we revealed potential accessibility challenges by conducting accessibility audits of two major cryptocurrency exchanges and two well-known banks. In order to achieve these, we used the accessibility evolution tools and we received information from visually impaired individuals through the survey method. As a result of these studies, we have revealed that serious accessibility problems exist both in the two major cryptocurrency exchanges and in the exchange applications of the banks. We will develop an accessibility tool to eliminate aforementioned accessibility problems and to enable visually impaired users to use interactive online stock market charts for their investments. Then, the tool will be tested by 10 visually impaired investors in order to disclose its effectiveness.

Keywords: Investment Accessibility, Visually Impaired.

HOME VISION AI BASED HOUSE PRICE FORECASTING

***Mohd Faizaanuddin*[1]**

[1] *Chaitanya Bharathi Institute of Technology (Osmania University), Student, Department of Artificial Intelligence and Data Science, Hyderabad, Telangana, India.*

***Afrah Fathima*[2]**

[2] *Maulana Azad National Urdu University, Hyderabad, Assistant Professor, Department of CS & IT, Hyderabad, Telangana, India.*

***Mohammed Affanuddin*[3]**

[3] *Lords Institute of Technology, Student, Department of Computer Science, Hyderabad, Telangana, India*

ABSTRACT

Real estate is a popular investment option, and knowing the value of a property is crucial in making informed investment decisions. Investors need to know the current market value of a property, to determine if it is a good investment opportunity. We have proposed a Machine Learning model that predicts the price of properties in Bangalore. The four most important parameter's location, sqaure feet's, number of rooms and number of bathrooms are used as an input to predict the price. The main purpose of this research is to determine the price of the house without going and enquiring physically. Two regression models have been used for this purpose.

Keywords: Machine Learning, Realestate.

DISPERSION CHARACTERIZATION OF OPTICAL FIBER IMPAIRMENTS IMPACT ON SINGLE MODE OPTICAL FIBER COMMUNICATION SYSTEMS

Sani Abdullahi Muhammad

ORCID ID:0000-0003-0178-5623

Kano State Polytechnic, School of Technology, Department of Electrical & Electronics Engineering, Kano State, Nigeria

Ishaq Bala Adam

Kano State Polytechnic, School of Technology, Department of Mechanical Engineering

Kano State, Nigeria

Sani Ahmad Muhammad

Kano State Polytechnic, School of Technology, Department of Computer Science,

Kano State, Nigeria

Sani Sale Yakubu

Kano State Polytechnic, Kano State Institute of Information Technology, Department of Computer Engineering, Kano State, Nigeria

Umar Alhassan Umar

Kano State Polytechnic, Kano State Institute of Information Technology, Department of Computer Science, Kano State, Nigeria

ABSTRACT

The single mode fiber (SMF) is a dielectric cylinder waveguide, made out of silica (SiO_2) glass, whose guiding properties are based on the total internal reflection principle. Propagation of light inside an SMF is subjected to linear and nonlinear effects that have to be considered together to define an accurate fiber channel model. In optical networks chromatic dispersion (CD) is one of the main obstacles in high-speed transmission. Pulse spreading due to the dispersion causes the overlapping of the transmitted pulses at the receiver end known as inter symbol interference (ISI). To reduce the dispersion and to improve the overall performance of this optical networks system, Dispersion Compensation Fiber and optical fiber amplifier dispersion compensation techniques are enacted on this proposed optical network system.in this paper the description of the impact of optical fiber impairments on quality of optical fiber transmission systems had been demonstrated analytically and verified numerically with simulation results.

Keywords: Optical fiber communication, Dispersion, Dispersion Compensation fiber (DCF). Single mode fiber (SMF), intersymbol interference (ISI)

COMPARISON OF ORDINARY AND UNIVERSAL KRIGING INTERPOLATION TECHNIQUES USING GSTAT

***Dendouga Imane*[1.a], *Abdelhamide Messameh*[2.b]**

[1. a.] *University Mohamed Khider, Departments of Civil Engineering and Hydraulics, Biskra, Algeria*

[2. b.] *University Mohamed Khider, Departments of Civil Engineering and Hydraulics, Biskra, Algeria*

ABSTRACT

In recent times, human activity has increased, and during this time, a lot of air or water pollution caused by industrial waste, coal ash, or chemical spills has occurred. These are examples of pollution that can pollute the environment and damage human health. To solve this problem, we need a method that is capable of predicting contaminant levels at unobserved locations. Therefore, the geostatistical method is the application of statistics to geological observations for prediction and mapping in unobserved locations. In this research, two types of interpolation methods are compared: universal kriging, which is an interpolation method that has a tendency to drift, and a special evaluation method used to deal with non-stationary sample data using ordinary kriging. Using Gstat R is a program based on the open source software R that can be used to predict pollutants in rivers at unobserved locations. The aim of this paper is to describe and compared the OK and UK methods by mapping a zinc variable, and their advantages and disadvantages will be discussed

Key Words: universal kriging, ordinary kriging, geostatistic, variogram.

TECHNO-ECONOMIC FEASIBILITY ANALYSIS OF GRID-CONNECTED PV SYSTEM STUDY UNDER NORTH-WEST ALGERIAN CLIMATE CONDITIONS

Hocine Mammeur
Renewable Enrgies Derpartement
Kasdi Merbah University
Ouargla, Algeria

Djamel Belatrache
VPRS Labroratory
Kasdi Merbah University
Ouargla, Algeria

Abdeldjalil Djouahi
VPRS Labroratory
Kasdi Merbah University
Ouargla, Algeria

Chouaib Ammari
Renewable Enrgies Derpartement
Kasdi Merbah University
Ouargla, Algeria

Amar Rouag
Renewable Enrgies Derpartement
Kasdi Merbah University
Ouargla, Algeria

Abdelkader Harrouz
Adrar University
Adrar, Algeria

ABSTRACT

Electricity price has been steadily increasing in recent years and all indications are that price will continue to rise in the foreseeable future. In the other side, electricity demand has increased significantly, particularly during summer periods, reaching significant peaks in consumption. This sharp increase in demand is a direct consequence of the change in consumer habits and the improvement of the quality of life, as well as the impulse given to the economic and industrial sectors. The work of this paper is reported on the techno-economic of the grid-connected PV systems in order to show the impact of the PV module cost over the time on the PV systems installation in Algeria between 2012 and 2018. The studied grid-connected PV system is located in the Chlef city in Algeria and has a power of 40 kWP to provide an annual energy of 91.28 MWh. Based on the $/kW of the components (PV module and inverter), $/kWh of the grid electricity and project lifetime, our study has focused on the study of the net present cost (NPC) for each component of the grid-connected PV system and the Annualized costs. In the year 2018, the results showed when the sellback price of PV energy is higher than 0.35 $/kWh, the Total NPC becomes negative and represents a financial gain that increases when the project lifetime increases.

Keywords: PV system, Grid-connected, Net present Cost (NPC), Electricity price, Sellback price

NUMERICAL PREDICTION OF THE DAMAGE DUCTILE OF THE STRUCTURE UNDER TENSILE LOADING

Benchaib Nadia[1*], Mechab Belaïd[1] ,Mokadem Salem[1] ,Haddou Yagoubia Marwa[1]

[1] Department of Mechanical Engineering, LMPM, University of Sidi Bel Abbes, BP 89 Cité Ben M'hidi 22000, Sidi Bel Abbes, Algeria.

ABSTRACT

Reliability engineering is a field of engineering, which deals with the study, evaluation of the structures: for analyzing of the ability of a system to perform its required functions under specified conditions for a specified period of the time. For the individual component failure rate to complex system management, the discipline has undergone various transformations to serve the need of increasing reliability level. This study presents a numerical prediction of the damage ductile of the structure used by the three-dimensional finite element method analysis subjected to tensile loading. The effect of the thickness (ep) and length (h) of structure is presented for analysis the probabilistic fracture mechanic of the damage ductile. The Monte Carlo method is used to predict the distribution function of the damage ductile. The failure probability of the structure was calculated by taking into account both the statistical uncertainty on the basic variables and the model uncertainty as previously discussed. The probability density function (pdf) is obtained by fitting the histogram with theoretical models. Three distribution laws are investigated Lorentz, Gaussian and Polynomial (9th order). The Gaussian law offers an acceptable approximation of the (ε) probability density function, with good estimation of the average. The uncertainties in the geometry parameter have a significant effect on increasing the probability of failure and reduced of the durability of the structure.

Keywords: Structure, Finite element method, Fracture, Probabilistic analysis, Damage ductile.