

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/366780494>

# BIOTYPING OF CAMPYLOBACTER SPECIES RECOVERED FROM POULTRY AND HUMANS IN BAGHDAD PROVINCE/IRAQ

Conference Paper · January 2023

CITATIONS

0

READS

233

3 authors:



**Manal Hadi Kanaan**

Middle Technical University

272 PUBLICATIONS 375 CITATIONS

[SEE PROFILE](#)



**Sura Saad**

Ministry of Health, Iraq

89 PUBLICATIONS 40 CITATIONS

[SEE PROFILE](#)



**Marwa Al-Rawi**

University of Anbar

4 PUBLICATIONS 0 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Antibacterial effect of ozonated water against methicillin-resistant *Staphylococcus aureus* contaminating chicken meat in Wasit Province, Iraq [View project](#)



RG Achievement and Accomplishments [View project](#)

**VII. ULUSLARARASI  
BİLİMSEL VE MESLEKİ ÇALIŞMALAR KONGRESİ  
FEN VE MÜHENDİSLİK  
(BILMES 2022)  
ÖZET METİN BİLDİRİ KİTABI**



**VII. INTERNATIONAL  
SCIENTIFIC AND VOCATIONAL STUDIES CONGRESS  
SCIENCE AND ENGINEERING  
(BILMES 2022)  
ABSTRACT PROCEEDINGS BOOK**

**ARALIK / DECEMBER 2022**

---

Kitabın Adı: VII. Uluslararası Bilimsel ve Mesleki Çalışmalar  
Kongresi – Fen ve Mühendislik Özet Metin Bildiri  
Kitabı

ISBN: 978-605-71214-5-5

Hazırlayanlar: Tolga YÜCEHAN  
e-mail: [tolgayucehan@gmail.com](mailto:tolgayucehan@gmail.com)

Umut SARAY  
e-mail: [umutsaray@gmail.com](mailto:umutsaray@gmail.com)

Yayın Tarihi: 26.12.2022



## DÜZENLEME KURULU / ORGANIZING COMMITTEES

### Düzenleme Kurulu Başkanı / Organizing Committee Chairman

Prof. Dr. Cem Cüneyt Ersanlı Sinop University  
Assoc. Prof. Uğur Çavdar İzmir Demokrasi University

### Düzenleme Kurulu Üyeleri / Organizing Committee Members

Ph.D. Cem Cüneyt Ersanlı Sinop University  
Ph.D. Uğur Çavdar İzmir Demokrasi University  
Ph.D. Canan Başlak Selçuk University  
Ph.D. Munise Didem Demirbaş Erciyes University  
Ph.D. Tolga Yücehan Afyon Kocatepe University  
Ph.D. Sefa Ersan Kaya Tokat Gaziosmanpaşa University  
Ph.D. Dilek Aydemir Tokat Gaziosmanpaşa University  
Ph.D. Atiye Kaş Pamukkale University  
Ph.D. Abdil Karakan Afyon Kocatepe University  
Ph.D. Serkan Göksu Afyon Kocatepe University  
Lect. Umut Saray Tokat Gaziosmanpaşa University  
Lect. Celal Altıntaş Tokat Gaziosmanpaşa University  
Lect. Erdem Kanışlı Tokat Gaziosmanpaşa University  
- Bahar Terzioğlu -  
- Sinem Gülşen -

### Düzenleme Kurulu Sekreteryası / Organizing Committee Secretariat

Ph.D. Tolga Yücehan Afyon Kocatepe University  
Lect. Umut Saray Tokat Gaziosmanpaşa University  
- Bahar Terzioğlu -  
- Sinem Gülşen -



## BİLİM KURULU / SCIENTIFIC COMMITTEES

Ph.D. Cem Cüneyt Ersanlı	Sinop University
Ph.D. Uğur Çavdar	İzmir Demokrasi University
Ph.D. Tolga Yücehan	Afyon Kocatepe University
Ph.D. Mohammad Ali Ghorbani	University of Tabriz
Ph.D. Fateh Mebarek Qudina	University of 20th August 1955 Skikda
Ph.D. Mahir Dursun	Gazi University
Ph.D. Ali Öztürk	Düzce University
Ph.D. İbrahim Uzun	Kırıkkale University
Ph.D. Bülent Kurt	Nevşehir Hacı Bektaş Veli University
Ph.D. Hakan Fehmi Öztop	Fırat University
Ph.D. Bilge Hilal Çadırıcı	Gaziosmanpaşa University
Ph.D. Vitaly Koshevyy	Odessa National Maritime Academy
Ph.D. Reza Norouzi	University of Tabriz
Ph.D. Sina Sadeghfam	University of Maragheh
Ph.D. Resul Kara	Düzce University
Ph.D. Serhii Kravchuk	National Technical University of Ukraine
Ph.D. Márcio R. C. Reis	Federal Institute of Goias
Ph.D. Doru Vatau	Polytechnic University of Timisoara
Ph.D. Igor Nevludov	Kharkiv National University of Radioelectronics
Ph.D. Atiku Abubakar Farooq	Kampala International University
Ph.D. Ata Allah Nadiri	University of Tabriz
Ph.D. Yuriy Danyk	National Defense University of Ukraine
Ph.D. Mourad Smari	University of Aveiro
Ph.D. Erkan Afacan	Gazi University
Ph.D. Rasoul Daneshfaraz	University of Maragheh
Ph.D. Aşkmer Güngör	Pamukkale University
Ph.D. Cengiz Taplamacioğlu	Gazi University
Ph.D. Necmi Taşpınar	Erciyes University
Ph.D. Mevlida Operta	University of Sarajevo
Ph.D. Sevgi Soylu Koyuncu	Ondokuz Mayıs University
Ph.D. Öznur Gölbaşı	Cumhuriyet University
Ph.D. Nacima Memic	University of Sarajevo
Ph.D. Salim A. Messaoudi	King Fahd University of Petroleum and Minerals
Ph.D. Yousef Nazzal	Zayed University
Ph.D. Tufan Doğruer	Gaziosmanpaşa University
Ph.D. Remzi Tuntaş	Van Yüzüncü Yıl University
Ph.D. Alexey Babushkin	Ural Federal University
Ph.D. Zehra Küçükbay	İnönü University
Ph.D. Selma Corbo	University of Sarajevo
Ph.D. Sabahudin Bajramovic	University of Sarajevo
Ph.D. Halil İbrahim Oğuz	Nevşehir Hacı Bektaş Veli University
Ph.D. Fatih Taşpınar	Düzce University
Ph.D. İsa Navruz	Ankara University
Ph.D. Cahit Bilim	Mersin University
Ph.D. Sibel Güneş	Erciyes University
Ph.D. Munise Didem Demirbaş	Erciyes University
Ph.D. Ahmet Fenercioğlu	Gaziosmanpaşa University
Ph.D. Jasna Avdic	University of Sarajevo
Ph.D. Ayhan İstanbullu	Balıkesir University
Ph.D. Caner Aküner	Marmara University
Ph.D. Oktay Erdoğan	Pamukkale University
Ph.D. Michal Váry	Slovak University of Technology
Ph.D. Özlem Ulukut Çoşkun	Süleyman Demirel University
Ph.D. Nursel Akçam	Gazi University
Ph.D. Recep Ekici	Erciyes University
Ph.D. Suat Sarıdemir	Düzce University
Ph.D. Fuad Okay	Kocaeli University



Ph.D. Fatih Polat	Gaziosmanpaşa University
Ph.D. Serpil Halıcı	Pamukkale University
Ph.D. Elif Tezel Ersanlı	Sinop University
Ph.D. Kadriye Yaman	Anadolu University
Ph.D. Eduard Zharikov	National Technical University of Ukraine
Ph.D. Sameh Hadouaj	University of Carthage
Ph.D. Bilal Şenol	İnönü University
Ph.D. Halil Arslan	Cumhuriyet University
Ph.D. Utku Köse	Süleyman Demirel University
Ph.D. Osman Gökdoğan	Nevşehir Hacı Bektaş Veli University
Ph.D. Mehmet Güçyetmez	Ahi Evran University
Ph.D. Salih Tosun	Düzce University
Ph.D. Feyza Gürbüz	Erciyes University
Ph.D. Güllü Kırat	Bozok University
Ph.D. Oğuz Erdem	Ahi Evran University
Ph.D. Selda Kayral	Celal Bayar University
Ph.D. Ali Yıldız	Bozok University
Ph.D. Aslıhan Tırnakçı	Nevşehir Hacı Bektaş Veli University
Ph.D. Esra Özhançacı	Nevşehir Hacı Bektaş Veli University
Ph.D. Meliha Aklıbaşında	Nevşehir Hacı Bektaş Veli University
Ph.D. Seval Cömertler	Uşak University
Ph.D. Nihan Kaya	Hitit University
Ph.D. Cem Emeksiz	Gaziosmanpaşa University
Ph.D. Hasan Polat	Fırat University
Ph.D. Soner Buytoz	Fırat University
Ph.D. Serdar Mercan	Cumhuriyet University
Ph.D. Praveen Kumar	Nss College of Engineering
Ph.D. Emre Kiyak	Eskişehir Technical University
Ph.D. Mustafa Eker	Gaziosmanpaşa University
Ph.D. Özer Özdemir	Anadolu University
Ph.D. Mehmet Şenol	Nevşehir Hacı Bektaş Veli University
Ph.D. Tülay Yağmur	Aksaray University
Ph.D. İlhami Karataş	Gaziosmanpaşa University
Ph.D. Fethi Dağdelen	Fırat University
Ph.D. Güngör Çağdaş Dinçel	Aksaray University
Ph.D. Serkan Yıldırım	Atatürk University
Ph.D. Meriç Lütfi Avsever	Aksaray University
Ph.D. Bekir Tuncer	Muğla Sıtkı Koçman University
Ph.D. Haşim Kafalı	Muğla Sıtkı Koçman University
Ph.D. Gökdeniz Erkan	Muğla Sıtkı Koçman University
Ph.D. Özlem Toprak	Gaziosmanpaşa University
Ph.D. Adem Gölcük	Selçuk University
Ph.D. İnanet Burcu Toprak	Akdeniz University
Ph.D. Yılmaz Güven	Kırklareli University
Ph.D. Nafel Dođdu	Akdeniz University
Ph.D. Olena Osharovska	Odessa National Academy
Ph.D. Mariia Skulysh	Igor Sikorsky Kyiv Polytechnic Institute
Ph.D. Selçuk Arık	Gaziosmanpaşa University
Ph.D. Canan Başlak	Selçuk University
Ph.D. İshak Afşin Kariper	Erciyes University
Ph.D. Sevgi Ünal	Bartın University
Ph.D. Ahmad Bin Yussuf	University of Malaya
Ph.D. Asuman Duru	Uşak University
Ph.D. Yusuf Sert	Bozok University
Ph.D. Abdullah Elen	Bandırma Onyediy Eylül University
Ph.D. Gökçe Nur Yılmaz	Ted University
Ph.D. Muradiye Karasu Ayata	Ahi Evran University
Ph.D. Derya Öğüt Yavuz	Uşak University
Ph.D. Nurcan Çalış Açıkbaş	Bilecik Şeyh Edebali University
Ph.D. Gökhan Açıkbaş	Bilecik Şeyh Edebali University



Ph.D. Aysen Melda Çolak	Uşak University
Ph.D. Nurdoğan Topal	Uşak University
Ph.D. Emre Avuçlu	Aksaray University
Ph.D. Cem Boğa	Adana Alparslan Türkeş Science and Technology University
Ph.D. Havva Dinler	Uşak University
Ph.D. Burcu Begüm Kenanoğlu	Uşak University
Ph.D. Esin Hande Bayrak Işık	Gaziosmanpaşa University
Ph.D. Özgür Demir	Muş Alparslan University
Ph.D. Doğan Erdemir	Erciyes University
Ph.D. Ali Özer	Cumhuriyet University
Ph.D. Ahmet Coşkun	Süleyman Demirel University
Ph.D. Çiğdem Gündoğan Türker	İstanbul Gedik University
Ph.D. Alperen Şahinoğlu	İstanbul Esenyurt University
Ph.D. Semih Taşkaya	Fırat University
Ph.D. Serdar Özyön	Kütahya Dumlupınar University
Ph.D. Feriha Erfan Kuyumcu	Gedik University
Ph.D. Tuğbahan Yılmaz Alıç	Selçuk University
Ph.D. İlhan Çelik	Samsun University
Ph.D. Gökhan Özer	Fatih Sultan Mehmet University
Ph.D. Mustafa Safa Yılmaz	Fatih Sultan Mehmet University
Ph.D. Derya Elmalı Şen	Karadeniz Technical University
Ph.D. Asım Gökhan Yetkin	Kütahya Dumlupınar University
Ph.D. Mehmet Murat Tezcan	Kütahya Dumlupınar University
Ph.D. Seda Bice Ataklı	Gaziosmanpaşa University
Ph.D. Mürşide Dartay	Fırat University
Ph.D. Mihrimah Özmen	Erciyes University
Ph.D. Pınar Sarı Çavdar	İzmir Demokrasi University
Ph.D. Nihat Pamuk	Zonguldak Bulent Ecevit University
Ph.D. Rıdvan Koçyiğit	Atatürk University
Ph.D. Waggas Galib Atshan	University of Al-Qadisiyah
Ph.D. Nalan Demircioğlu	Atatürk University
Ph.D. Nedim Muzoğlu	İstanbul University
Ph.D. Nuray Demir	Atatürk University
Ph.D. Oğuz Mısır	Tokat Gaziosmanpaşa University
Ph.D. Cihat Yıldız	Atatürk University
Ph.D. Seyda Şahin	Sivas Cumhuriyet University
Ph.D. Gülşen Tozsın	Atatürk University
Ph.D. Abdil Karakan	Afyon Kocatepe University



## KONGRE PROGRAMI / CONFERENCE SCHEDULE

ORAL PRESENTATION				
16 December 2022 - Friday				
Session - Invited Speakers				
<b>Hall Name:</b> BILMES 2022		<b>Meeting Hall Chairman :</b> PH.D. TOLGA YUCEHAN <b>Meeting Hall Vice-Chairman:</b> PH.D. ABDIL KARAKAN		
Time	Title of Study	Authors	Corresponding Author	Presenter
16:00 - 16:10	NANO ENHANCED PCMS FOR THERMAL AND ENERGETIC SYSTEMS	FATEH MEBAREK-LOUDINA	FATEH MEBAREK-LOUDINA	FATEH MEBAREK-LOUDINA
16:10 - 16:20	TRENDS IN INEQUALITIES IN CHILDHOOD STUNTING IN ETHIOPIA FROM 2000 TO 2016: A CROSS SECTIONAL STUDY	BETREGIORGIS ZEGEYE, GEBRETSADIK SHIBRE, DINA IDRIS-WHEELER, SANNA YAYA	SANNA YAYA	BETREGIORGIS ZEGEYE
16:20 - 16:30	PETROLEUM HYDROCARBON BIOREMEDIATION OF CONTAMINATED SOIL IN THARJITAH OIL FIELD SOUTH SUDAN	GATLUOK KOANG GACH, PETER BENJAMIN AINA, ABDULFATAH ABDU YUSUF, FAROOQ ABUBAKAR ATIKU, ZAINAB IBRAHIM SARKIN GOBIR ADIYA	FAROOQ ABUBAKAR ATIKU	FAROOQ ABUBAKAR ATIKU
16:30 - 16:40	BIOTYPING OF CAMPYLOBACTER SPECIES RECOVERED FROM POULTRY AND HUMANS IN BAGHDAD PROVINCE/IRAQ	MANAL HADI GHAFPOORI KANAAN, SURA SAAD ABDULLAH, MARWA SHAKIB ALRAWI	MANAL HADI GHAFPOORI KANAAN	MANAL HADI GHAFPOORI KANAAN
16:40 - 16:50	APPLICATION OF SCREEN-DROP STRUCTURES AND ITS EFFECT ON HYDRAULIC CHARACTERISTICS OF FLOW	BEHNAM NAYEBZADEH, MOHAMMAD ALI LOTFOLLAHI-YAGHIN, HAMIDREZA ABBASZADEH, RASOUL DANESHFARAZ	RASOUL DANESHFARAZ	HAMIDREZA ABBASZADEH
16:50 - 17:00	NUMERICAL SIMULATION EFFECT OF CUTOFF WALL BELOW IN CLAY CORE OF SABALAN ROCKFILL DAM WITH NON-ISOTROPIC PERMEABILITY FOUNDATION	MARYAM ABAR, BEHNAZ AKHUNDI, ELAHE MEHRIVAR, RASOUL DANESHFARAZ, REZA NOROUZI	REZA NOROUZI	REZA NOROUZI
17 December 2022 - Saturday				
Session 1				
<b>Hall Name:</b> BILMES 2022		<b>Meeting Hall Chairman :</b> PH.D. TOLGA YUCEHAN <b>Meeting Hall Vice-Chairman:</b> PH.D. ABDIL KARAKAN		
Time	Title of Study	Authors	Corresponding Author	Presenter
09:30 - 09:40	HYALURONIC ACID /BSA NANO-BIO COMPOSITE SYSTEMS AS NOVEL GREEN CARRIERS FOR COVALENT IMMOBILIZATION OF SUPEROXIDE DISMUTASE/CATALASE AS NEWFANGLED BIOCATALYSTS: IMPROVED REUSABILITY, STABILITY	ATHEER ATIROGLU, ALI SULTAN AL- HAJRI , AHMED ATIROGLU, VESEN ATIROGLU	VESEN ATIROGLU	ATHEER ATIROGLU
09:40 - 09:50	PLANT TISSUE CULTURE AND APPLICATION AREAS	HULYA ARIKAN CEYLAN	HULYA ARIKAN CEYLAN	HULYA ARIKAN CEYLAN
09:50 - 10:00	EFFECTS OF SOME PLANTS OF MEDICAL IMPORTANCE ON BREAST CANCER	KUBILAY SAHIN, SEVGI UNAL KARAKUS	KUBILAY SAHIN	KUBILAY SAHIN
10:00 - 10:10	DEVELOPMENT AND CHARACTERIZATION OF NANOHYDROXYAPATITE DOPED POLYMERIC NANOCOMPOSITE MEMBRANES	TUGBA SARDOHAN KOSEOGLU, EMINE GONEN, HASAN KOSEOGLU	EMINE GONEN	EMINE GONEN
10:10 - 10:20	SYNTHESIS, CHARACTERIZATION AND INVESTIGATION OF ANTIMICROBIAL PROPERTIES OF NEW SULFONATES CONTAINING 1,2,4-TRIAZOL-5-ONE RING	FEYZI SINAN TOKALI, HAYDAR YUKSEK	FEYZI SINAN TOKALI	FEYZI SINAN TOKALI
10:20 - 10:30	BALLISTIC BEHAVIOR OF POLYMER-COATED ARAMID COMPOSITE SHEET	CEMILE SEYDA YARDIM, UMUT CALISKAN, MURAT AYDIN	UMUT CALISKAN	UMUT CALISKAN





**Session 2**

**Hall Name:** BILMES 2022

**Meeting Hall Chairman :** PH.D. TOLGA YUCEHAN

**Meeting Hall Vice-Chairman:** PH.D. ABDIL KARAKAN

Time	Title of Study	Authors	Corresponding Author	Presenter
11:00 - 11:10	ESTIMATION OF STUDENTS PERFORMANCE IN DISTANCE EDUCATION USING MACHINE LEARNING	ABDULLAH AL-SHAIKHLI, SAIT DEMIR	ABDULLAH AL-SHAIKHLI	ABDULLAH AL-SHAIKHLI
11:10 - 11:20	CLASSIFYING SEM IMAGES WITH CNN METHODOLOGY	AYSE DEMIRKAN, ISMAIL TOPCU	AYSE DEMIRKAN	AYSE DEMIRKAN
11:20 - 11:30	EDUCATION OF SEM IMAGES WITH MACHINE LEARNING METHODOLOGY	AYSE DEMIRKAN, ISMAIL TOPCU	AYSE DEMIRKAN	AYSE DEMIRKAN
11:30 - 11:40	FAULT DETECTION IN PHOTOVOLTAIC ENERGY SYSTEMS BY USING DECISION TREES	VOLKAN YAMACLI	VOLKAN YAMACLI	VOLKAN YAMACLI
11:40 - 11:50	DESIGN OF LINEAR SWITCHED RELUCTANCE MOTOR	MUSTAFA EKER	MUSTAFA EKER	MUSTAFA EKER
11:50 - 12:00	TRAINING SEM IMAGES USING NANOTECHNOLOGY AND ARTIFICIAL INTELLIGENCE TECHNIQUES	AYSE DEMIRKAN, ISMAIL TOPCU	AYSE DEMIRKAN	AYSE DEMIRKAN

Break

**Session 3**

**Hall Name:** BILMES 2022

**Meeting Hall Chairman :** PH.D. TOLGA YUCEHAN

**Meeting Hall Vice-Chairman:** PH.D. ABDIL KARAKAN

Time	Title of Study	Authors	Corresponding Author	Presenter
13:00 - 13:10	SHEET MATERIAL OPTIMIZATION	HILAL KIR, TIMUCIN KALE, MEHMET SELIM ODA, SUKRU TALAS	HILAL KIR	HILAL KIR
13:10 - 13:20	INVESTIGATION OF THE RESISTANCE OF ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE SHEETS AGAINST HIGH-SPEED PARTICLE	ERHAN OZDEMIR, UMUT CALISKAN , MURAT AYDIN	UMUT CALISKAN	ERHAN OZDEMIR
13:20 - 13:30	INVESTIGATION OF BALLISTIC PERFORMANCE OF SUPER ELASTIC METAL-FIBER LAYER SANDWICH STRUCTURES	BERKAN SAMI KALIN, UMUT CALISKAN, ZEYNEP GUL APALAK	UMUT CALISKAN	BERKAN SAMI KALIN
13:30 - 13:40	IMPACT OF DROPLETS ON SURFACES WITH CHEMICAL HETEROGENEITIES	ATALAY SECER, UMUT CEYHAN	ATALAY SECER	ATALAY SECER
13:40 - 13:50	EFFECTS OF VARIABLE WALL SURFACE ENERGY ON THE MOTION OF SELF-DRIVEN INTERFACE IN A CAPILLARY MICROCHANNEL	MEHMET ALPTUG BOYLU, UMUT CEYHAN	MEHMET ALPTUG BOYLU	MEHMET ALPTUG BOYLU
13:50 - 14:00	INVESTIGATION OF SHIP-BASED EMISSIONS IN THE BOSPHORUS	ARAKS EKMEKCIOGLU , UGUR BUGRA CELEBI	ARAKS EKMEKCIOGLU	ARAKS EKMEKCIOGLU



**Session 4**

**Hall Name:** BILMES 2022

**Meeting Hall Chairman :** PH.D. TOLGA YUCEHAN

**Meeting Hall Vice-Chairman:** PH.D. ABDIL KARAKAN

Time	Title of Study	Authors	Corresponding Author	Presenter
14:30 - 14:40	A CLINICAL REVIEW: COVID-19 AND DERMATOLOGY	HANIFE MERVE AKCA	HANIFE MERVE AKCA	HANIFE MERVE AKCA
14:40 - 14:50	DESIGN OF PH-TRIGGERED MOXIFLOXACIN HCL LOADED OCULAR IN SITU GELS; IN VITRO CHARACTERIZATION AND RELEASE STUDIES	HEYBET KEREM POLAT	HEYBET KEREM POLAT	HEYBET KEREM POLAT
14:50 - 15:00	DEVELOPMENT AND CHARACTERIZATION OF FLURBIPROFEN-LOADED PLGA MICROSPHERES FOR OCULAR DRUG ADMINISTRATION	SEDAT UNAL	SEDAT UNAL	SEDAT UNAL
15:00 - 15:10	COMPARISON OF CYTOTOXIC AND ANTI-INFLAMMATORY ACTIVITIES OF COMMERCIAL PELARGONIUM SIDOIDES EXTRACT WITH ROOT EXTRACTS OF PELARGONIUM SPECIES GROWN IN TURKEY	ESRA KONGUL SAFAK, GOKCE SEKER KARATOPRAK	ESRA KONGUL SAFAK	ESRA KONGUL SAFAK
15:10 - 15:20	8-HYDROXY-2-DEOXYGUANOSINE AS AN OXIDATIVE DNA DAMAGE PRODUCT	BEYZA SUVARIKLI ALAN, ZAFER BULUT	BEYZA SUVARIKLI ALAN	BEYZA SUVARIKLI ALAN
15:20 - 15:30	SOME COMMON INHERITED DISEASES IN DOGS	BEYZA SUVARIKLI ALAN, RANA KARCAALTINCABA, ZAFER BULUT	BEYZA SUVARIKLI ALAN	BEYZA SUVARIKLI ALAN

**18 December 2022 - Sunday**

**Session 5**

**Hall Name:** BILMES 2022

**Meeting Hall Chairman :** PH.D. TOLGA YUCEHAN

**Meeting Hall Vice-Chairman:** PH.D. ABDIL KARAKAN

Time	Title of Study	Authors	Corresponding Author	Presenter
11:00 - 11:10	FOLIAR EFFECT OF OXALIC ACID ON ROCKET NUTRIENT ELEMENTS	MEHMET ULUDAG, HALIME OZDAMAR UNLU, ENISE SUKUSU, VELI UYGUR	MEHMET ULUDAG	MEHMET ULUDAG
11:10 - 11:20	DEVELOPMENT OF INDUSTRIAL DESIGN IN TURKISH AUTOMOTIVE INDUSTRY; YESTERDAY, TODAY, TOMORROW	FUAT ALI PAKER	FUAT ALI PAKER	FUAT ALI PAKER
11:20 - 11:30	N-VINYL-2-PYRROLIDONE BASED HYDROGELS REINFORCED WITH MODIFIED SEPIOLITE	MEHMET YURTTADUR, GULCIHAN GUZEL KAYA, HUSEYIN DEVECI	HUSEYIN DEVECI	MEHMET YURTTADUR
11:30 - 11:40	COMPARISON OF TWO MAGNETIC STORMS OCCURRED IN SAME SOLAR ACTIVITY PERIOD	SAMED INYURT	SAMED INYURT	SAMED INYURT
11:40 - 11:50	ANALYSIS OF BLOCK PLANNING PRINCIPLES IN LAND CONSOLIDATION PROJECTS WITH SURVEYS	HASAN CAGLA, TAYFUN CAY	HASAN CAGLA	HASAN CAGLA
11:50 - 12:00	BIOINFORMATICS INVESTIGATION OF TAU PROTEINS WHICH HAVE A PLACE IN THE PATHOGENESIS OF NEURODEGENERATIVE DISEASES SUCH AS ALZHEIMER'S, DEMENTIA	HUDANUR DEMIR, ESMA ERYILMAZ DOGAN	HUDANUR DEMIR	HUDANUR DEMIR



**Session 6**

**Hall Name:** BILMES 2022 **Meeting Hall Chairman :** PH.D. TOLGA YUCEHAN  
**Meeting Hall Vice-Chairman:** PH.D. ABDIL KARAKAN

Time	Title of Study	Authors	Corresponding Author	Presenter
13:00 - 13:10	MULTI-CLASS FEATURE SELECTION WITH METAHEURISTIC ALGORITHM THE CASE OF SIVRICE EARTHQUAKE	MEHLIKA ERASLAN CELIK, MIHRIMAH OZMEN	MIHRIMAH OZMEN	MIHRIMAH OZMEN
13:10 - 13:20	INTEGRATION OF IMAGE PROCESSING TECHNIQUES IN HOLE SIZE AND LOCATION CONTROL IN FURNITURE ELEMENTS	ERKAN BAYIR, MURAT BULCA, SEZER SELIM, BETUL KILIC, ERDAL KARABULUT	ERKAN BAYIR	ERKAN BAYIR
13:20 - 13:30	MULTI-OBJECTIVE EVOLUTIONARY ALGORITHM DAMAGE PREDICTION APPROACH FOR THE CASE OF SAMOS EARTHQUAKE	MEHLIKA ERASLAN CELIK, MIHRIMAH OZMEN	MIHRIMAH OZMEN	MIHRIMAH OZMEN
13:30 - 13:40	DYNAMIC RESPONSE OF THE TWO-AXLE BOGIE FRAME IN A SUPERELEVATION RAMP WITH A VARIABLE CURVATURE	HALUK YILMAZ, IBRAHIM KOCABAS	HALUK YILMAZ	IBRAHIM KOCABAS
13:40 - 13:50	INVESTIGATION OF SURFACE PREPARATION OF AA6061-T6 FOR ADHESIVE BONDING	YUSUF ERHAN ARSLAN, MUSTAFA KEMAL APALAK	YUSUF ERHAN ARSLAN	YUSUF ERHAN ARSLAN
13:50 - 14:00				

Break

**Session 7**

**Hall Name:** BILMES 2022 **Meeting Hall Chairman :** PH.D. TOLGA YUCEHAN  
**Meeting Hall Vice-Chairman:** PH.D. ABDIL KARAKAN

Time	Title of Study	Authors	Corresponding Author	Presenter
14:30 - 14:40	INVESTIGATING OF CONVERSION PROCEDURES FOR FOSSIL FUEL VEHICLES TO ELECTRIC VEHICLES	M. MURAT TEZCAN, SUMEYRA TASER	M. MURAT TEZCAN	SUMEYRA TASER
14:40 - 14:50	PHOTOVOLTAIC TECHNOLOGIES OF FLEXIBLE SOLAR PANELS FOR SELF CHARGING ELECTRIC VEHICLES	M. MURAT TEZCAN, AYCA AKKAYA	M. MURAT TEZCAN	AYCA AKKAYA
14:50 - 15:00	PRESCRIPTIVE ANALYTICS AND ADVANCED WORKFORCE MANAGEMENT FOR OPTIMIZED O&M OF SOLAR POWER PLANTS "PANAMA"	UGUR CEM YILMAZ, RABIA SEYMA GUNES, CANAN SISMAN KORKMAZ, ALPER TERCİYANLI	UGUR CEM YILMAZ	UGUR CEM YILMAZ
15:00 - 15:10	STORING MEDICAL INFORMATION THROUGH A BLOCK CHAIN BASED SYSTEM	CANER SONGUL, MELIH OZ	CANER SONGUL	CANER SONGUL
15:10 - 15:20	AIRCRAFT BRAKE INDUCED VIBRATIONS INVESTIGATION FOR GEAR-WALK AND BRAKE CHATTER PHENOMENA	ONER ALTINBAG, DEMET BALKAN	ONER ALTINBAG	ONER ALTINBAG
15:20 - 15:30	EXAMPLE APPLICATION APPROACH IN ENTERPRISE RESOURCE PLANNING SOFTWARE TO ENSURE DATA SECURITY WITH PERSONAL DATA ENCRYPTION AND ANONYMIZATION METHODOLOGY	KUTAY EKICI, DEREN DELETIOGLU	DEREN DELETIOGLU	DEREN DELETIOGLU



## DAVETLİ KONUŞMACILAR / INVITED SPEAKERS

### NANO ENHANCED PCMS FOR THERMAL AND ENERGETIC SYSTEMS

**Fateh Mebarek-Oudina**

*Department of Physics, Faculty of Sciences, University of 20 Août 1955-Skikda, Skikda 21000, Algeria*

*f.mebarek\_oudina@univ-skikda.dz*

#### Abstract

The excellent thermo-physical characteristics of the nanoparticles greatly affected the behavior of the PCM, ensuing in improved thermal performance. For this Nano enhanced PCMs are considered as excellent options for thermal and energetic systems. PCMs attested to be valuable and drew the attention of diverse scientists striving to start novel methods. This work provides an overall overview on how to overcome those constrains via adapting nano enhanced phase change materials. Latest computational and experimental studies have revealed that nanoparticles <sup>[1-7]</sup> are very helpful in terms of improving the thermo-physical properties of PCMs, allowing Nano-PCMs, mainly nano-paraffin, to have a major positive impact on thermal concepts at the ecological, economical, and effectiveness levels. Further research revealed that temperature management is also provided by the combination of nanoparticles and PCMs, which ensures thermal comfort at a very low cost.

**Keywords :** *Thermal systems enhancement; Nano-PCMs; Thermal management.*

#### References

- [1] B. V. Pushpa, M. Sankar, F. Mebarek-Oudina, Buoyant convective flow and heat dissipation of Cu-H<sub>2</sub>O nanoliquids in an annulus through a thin baffle, *Journal of Nanofluids*, 10 (2) (2021) 292-304; <https://doi.org/10.1166/jon.2021.1782>
- [2] K. Dhif, F. Mebarek-Oudina, S. Chouf, H. Vaidya and Ali J. Chamkha, Thermal Analysis of the Solar Collector Cum Storage System using a Hybrid-Nanofluids, *Journal of Nanofluids*, 10 (4), (2021) 634–644; <https://doi.org/10.1166/jon.2021.1807>
- [3] Shafiq, F. Mebarek-Oudina, T. N. Sindhu and Rassoul, G., Sensitivity analysis for Walters' B nanoliquid flow over a radiative Riga surface by RSM, *Scientia Iranica*, 2022, 29 (3), 1236-1249, <https://doi.org/10.24200/SCI.2021.58293.5662>
- [4] I. Chabani, F. Mebarek-Oudina, H. Vaidya, and A. I. Ismail, Numerical analysis of magnetic hybrid Nano-fluid natural convective flow in an adjusted porous trapezoidal enclosure, *Journal of Magnetism and Magnetic Materials*, 2022, 564 (2), 170142. <https://doi.org/10.1016/j.jmmm.2022.170142>
- [5] Y. D. Reddy, F. Mebarek-Oudina, B. S. Goud, A. I. Ismail, Radiation, Velocity and Thermal Slips Effect Toward MHD Boundary Layer Flow Through Heat and Mass Transport of Williamson Nanofluid with Porous Medium, *Arabian Journal for Science and Engineering*, 2022, 47(12), 16355–16369.. <https://doi.org/10.1007/s13369-022-06825-2>
- [6] F. Mebarek-Oudina, Convective Heat Transfer of Titania Nanofluids of different base fluids in Cylindrical Annulus with discrete Heat Source, *Heat Transfer-Asian Research*, 48(2019) 135-147. (Wiley, ISI) <https://doi.org/10.1002/htj.21375>



[7] F. Mebarek Oudina, & I. Chabani, Review on Nano-fluids applications and heat transfer enhancement techniques in different enclosures, *Journal of Nanofluids*, 11(2),155-168, 2022.  
<https://doi.org/10.1166/jon.2022.1834>



## TRENDS IN INEQUALITIES IN CHILDHOOD STUNTING IN ETHIOPIA FROM 2000 TO 2016: A CROSS SECTIONAL STUDY

**Betregiorgis Zegeye<sup>1</sup>, Gebretsadik Shibre<sup>2</sup>,  
Dina Idriss-Wheeler<sup>3</sup>, Sanni Yaya<sup>4\*</sup>**

<sup>1</sup> HaSET Maternal and Child Health Research Program, Shewarobit Field Office, Addis Ababa, Ethiopia

ORCID ID: 0000-0003-4550-3261, betregiorgiszegeye27@gmail.com

<sup>2</sup> Department of Reproductive, Family and Population Health, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

ORCID ID: 0000-0001-6671-9833, gebretsh@gmail.com

<sup>3</sup> Interdisciplinary School of Health Sciences, University of Ottawa, Ottawa, Canada

didri040@uottawa.ca

<sup>4</sup> School of International Development and Global Studies, University of Ottawa, Ottawa, Canada

<sup>4</sup> The George Institute for Global Health, The University of Oxford, Oxford, UK

ORCID ID: 0000-0002-4876-6043, sanni.yaya@uOttawa.ca

\* Corresponding Author

### Abstract

The decrease in the magnitude of stunting over the past 20 years has been slow in Ethiopia. To date, in Ethiopia, the trends in and extent of inequality in stunting have not been investigated using methods suitably developed for disparity studies. This paper investigated both the extent and overtime dynamics of stunting inequality in Ethiopia over the last 17 years.

Using the World Health Organization's Health Equity Assessment Toolkit software, data from the Ethiopia Demographic and Health surveys (EDHS) were analyzed between 2000 and 2016. The inequality analysis consisted of disaggregated rates of stunting using five equity stratifiers (economic status, education, residence, region and sex) and four summary measures (Difference, Population Attributable risk, Ratio and Absolute Concentration Index). A 95% uncertainty interval was constructed around point estimates to measure statistical significance.

The study showed that both absolute and relative inequalities in stunting exist in all the studied years in Ethiopia. The inequality disfavors children of mothers who are poor, uneducated and living in rural areas and specific regions such as Amhara. The pro-rich ( $R = 1.2; 1.1, 1.3$  in 2000 to  $R = 1.7; 1.4, 2$  in 2016) and pro-educated ( $R = 1.6; 95\%UI = 1.3, 1.9$  in 2000 and  $R = 2.3; 95\%UI = 1.5, 3$  in 2011) inequalities slightly increased with time. Male children bear a disproportionately higher burden of stunting, and the disparity increased between the first and the last time points ( $PAR = -1.5$   $95\%UI = -2.5, -0.6$  in 2000 and  $PAR = -2.9$   $95\%UI = -3.9, -1.9$ ) based on complex measures but remained constant with simple measures ( $R = 1; 95\%UI = 0.9, 1.1$  in 2000 and  $R = 1.1$   $95\%UI = 1, 1.2$  in 2016). Similarly, both the sub-national regional and residence-related stunting disparities generally widened over time according to some of the inequality measures.

Stunting appeared to be highly prevalent among certain sub-groups (i.e. poor, uneducated and living in rural regions). The subpopulations experiencing excessively high stunting prevalence



should be the focus of policy makers' attention as they work to achieve the WHO 40% reduction in stunting target by 2025 and the UN Agenda 2030 for Sustainable Development Goals.

**Keywords:** *DHS, Ethiopia, Global health, Inequality, Stunting*



## PETROLEUM HYDROCARBON BIOREMEDIATION OF CONTAMINATED SOIL IN THARJITAH OIL FIELD SOUTH SUDAN

**Gatluok Koang Gach<sup>1</sup>, Peter Benjamin Aina<sup>2</sup>, Abdulfatah Abdu Yusuf<sup>3</sup>,  
Farooq Abubakar Atiku<sup>3,4,\*</sup>, Zainab Ibrahim Sarkin Gobir Adiya<sup>5</sup>**

<sup>1</sup> *Department of Civil Engineering, Kampala International University, Uganda. & Sudd Petroleum Operating Company, Amarat Residential Area Juba, South Sudan*

<sup>2</sup> *Department of Mathematics Kampala International University Uganda.*

<sup>3</sup> *Department of Mechanical Engineering, Kampala International University Uganda.*

*fuels7000@gmail.com*

<sup>4</sup> *Department of Pure and Applied Chemistry, KSUSTA Nigeria. & Research Associates ERI University of Leeds, UK.*

*fuels7000@gmail.com*

<sup>5</sup> *Department of Pure and Applied Chemistry, Usmanu Danfodiyo University Sokoto, Nigeria.*

*\* Corresponding Author*

### Abstract

Petroleum is the source of energy for various industries and daily life. Releasing petroleum or hydrocarbons into the environments whether accidentally or human activities are main cause of soil pollutions. Soil contaminant with petroleum has a serious hazard to health and causes environmental problems classified as priority pollutants. The application of microorganism or microbial processes to remove or degrade contaminants from soil is bioremediation, and this has been a potential means hydrocarbon recovery

This microbiological decontamination claimed to be an efficient, economic and versatile alternative to physicochemical treatments. This article presents an overview about bioremediation of petroleum-contaminated soil. It also includes an explanation about the types of bioremediation technologies as well as the process.

Thus, the various strategies were established been optioned and to investigate the most cost-effective solution to deal with contaminated sites. Among the potential approach is bioremediation since many studies have reported of its effectiveness in removing numerous pollutants from contaminated sites. It involves mainly bio-pile techniques mediated bioremediation that involved above ground piling of excavated polluted soil followed by nutrients amendment and sometimes aeration to enhanced bioremediation, increasing microbial activities.

The components of this technique are aeration, irrigation, nutrients and leachate collection system and bed treatments. The use of this ex-situ technique is increasingly have been considered. Due to its constructive features including cost effectiveness that enables effective biodegradation on the condition that nutrients, temperature and aeration are adequately controlled. The application of bio-pile to polluted sites can help limit volatilization of low molecular weight (LMW) pollutants.

**Keywords:** *Bioremediation, Petroleum Hydrocarbon, Soil Contamination, Biopile Advanced Technique, Thermo-Gravimetric Analysis, and Gas Chromatography Technique*





## BIOTYPING OF CAMPYLOBACTER SPECIES RECOVERED FROM POULTRY AND HUMANS IN BAGHDAD PROVINCE/IRAQ

Manal Hadi Ghaffoori Kanaan <sup>1\*</sup>, Sura Saad Abdullah <sup>2</sup>, Marwa Shakib Alrawi <sup>3</sup>

<sup>1</sup> Agriculture Department, Technical Institute of Suwaria, Middle Technical University, Baghdad, Iraq.

ORCID ID: 0000-0002-9409-4778, manalkanaan94@gmail.com

<sup>2</sup> Al- Suwaria General Hospital, Wassit Health Office, Wassit, Iraq.

ORCID ID:0000-0001-5730-9410, Surakenan1994@gmail.com

<sup>3</sup> University of Anbar, College of Pharmacy, Department of Pharmacology and Toxicology, Iraq.

marwashakib1986@uoanbar.edu.iq

\* Corresponding Author

### Abstract

One of the leading causes of bacterial gastroenteritis globally is campylobacteriosis, which is mostly brought on by *Campylobacter jejuni* (*C. jejuni*) and *Campylobacter coli* (*C. coli*). In order to examine the *Campylobacter* biotypes, this study compared the biotypes of 24 *Campylobacter* isolates that were isolated from human and chicken meat samples from the Baghdad province by utilizing the Lior biotyping method. The findings demonstrated that among *Campylobacter*, two different biotypes were identified. These were biotypes (I & II). Additionally, when compared to biotype II (18.2% & 23.1%), the two species showed a higher incidence of biotype I (81.8% & 76.9%, respectively). Furthermore, isolates from chicken and humans had higher biotype I prevalence rates, at 80% and 77.8%, respectively. And since biotype I of those species conquered in human being, while biotype II was more public in animals, so, the outcomes demonstrate that these foods contribute to the spread of disease among consumers.

**Keywords:** *Biotyping, Campylobacter, Chicken meat, Baghdad province.*



## APPLICATION OF SCREEN-DROP STRUCTURES AND ITS EFFECT ON HYDRAULIC CHARACTERISTICS OF FLOW

**Behnam Nayebzadeh <sup>1\*</sup>, Mohammad Ali Lotfollahi-Yaghin <sup>2</sup>,  
Hamidreza Abbaszadeh <sup>3</sup>, Rasoul Daneshfaraz <sup>4\*</sup>**

<sup>1</sup> University of Tabriz, Faculty of Civil Engineering, Iran

ORCID ID: 0000-0001-6808-4544, bnayebzadeh@gmail.com

<sup>2</sup> University of Tabriz, Faculty of Civil Engineering, Iran

ORCID ID: 0000-0003-2628-4083, lotfollahi@tabrizu.ac.ir

<sup>3</sup> University of Tabriz, Faculty of Civil Engineering, Iran

ORCID ID:0000-0001-7714-6081, hamidrezatomcat@yahoo.com

<sup>4</sup> University of Maragheh, Department of Civil Engineering, Iran

ORCID ID:0000-0003-1012-8342, daneshfaraz@maragheh.ac.ir

\* Corresponding Author

### Abstract

Here, the energy dissipation of the flow is investigated with the vertical drop, gradually expanding, and vertical screens. The experiments were carried out, with two vertical drop heights, and wall expanding ratios of 0.5 to 1. Also, the porosity ratio of the screens was 40% and 50%. The results showed that the use of screens increases energy dissipation, and decreases the pool depth and the downstream depth. The application of expanding walls, screens and the effect of simultaneous use of screens and expanding walls increases the efficiency of energy dissipation by 25, 44, and 48%, respectively. The porosity ratio of the screen is not much efficient in energy dissipation, but it reduces the pool depth and increases the downstream depth. In the same hydraulic conditions, energy dissipation is increased and the depth of the pool decreases by increasing the height of the drops due to the increased jet severity over the drop striking the downstream bed.

**Keywords:** *Screen, Drop, Energy Dissipation*



## NUMERICAL SIMULATION EFFECT OF CUTOFF WALL BELOW IN CLAY CORE OF SABALAN ROCKFILL DAM WITH NON-ISOTROPIC PERMEABILITY FOUNDATION

Maryam Abar <sup>1</sup>, Behnaz Akhundi <sup>2</sup>, Elahe Mehrivar <sup>3</sup>,  
Rasoul Daneshfaraz <sup>4</sup>, Reza Norouzi <sup>5\*</sup>

<sup>1</sup> University of Maragheh, Department of Civil Engineering, Iran

ORCID: 0000-0001-5008-5223, m.abar@stu.maragheh.ac.ir

<sup>2</sup> University of Maragheh, Department of Civil Engineering, Iran

ORCID: 0000-0003-3865-255x, b.akhondi@stu.maragheh.ac.ir

<sup>3</sup> University of Maragheh, Department of Civil Engineering, Iran

ORCID: 0000-0001-6648-9804, e.mehrvivar@stu.maragheh.ac.ir

<sup>4</sup> University of Maragheh, Department of Civil Engineering, Iran

ORCID ID: 0000-0003-1012-8342, daneshfaraz@maragheh.ac.ir

<sup>5</sup> University of Tabriz, Department of water engineering, Iran

ORCID ID: 0000-0002-3756-8746, rezanorouzi1992@tabrizu.ac.ir

\* Corresponding Author

### Abstract

One of the important issues in soil dam design construction is controlling seepage from the body and foundation of the dam for stability secure and prevention of piping and water loss. The seepage through the foundation of earth dams can be controlled using cut-off walls. This study investigates the efficiency of the cutoff wall on some design parameters in the Sabalan rockfill dam. For this purpose, different positions of cutoff walls with various depth and permeability were used in the non-isotropic foundation of the dam. The results showed that the maximum hydraulic gradient in the foundation of the Sabalan dam occurs at the cutoff wall. Change in cut-off wall position for obtaining minimum hydraulic gradient showed that the optimal position of the cut-off wall for reducing the hydraulic gradient is in the toe of the core and the optimal position of cut-off the wall for reducing the seepage is in the heel of the core. By reducing the permeability and increasing the depth of the cutoff wall, the hydraulic gradient is increased and the seepage is decreased. Comparison of the effect of permeability and depth of the cutoff wall on seepage with corresponding values in Karkheh embankment dam, showed proper agreement between them.

**Keywords:** *Cutoff wall, Hydraulic gradient, non-isotropic foundation, Sabalan rockfill dam, Seepage*



## İÇİNDEKİLER / CONTENTS

<b>DÜZENLEME KURULU / ORGANIZING COMMITTEES</b> .....	<b>II</b>
<b>BİLİM KURULU / SCIENTIFIC COMMITTEES</b> .....	<b>III</b>
<b>KONGRE PROGRAMI / CONFERENCE SCHEDULE</b> .....	<b>VI</b>
<b>DAVETLİ KONUŞMACILAR / INVITED SPEAKERS</b> .....	<b>X</b>
NANO ENHANCED PCMS FOR THERMAL AND ENERGETIC SYSTEMS .....	X
TRENDS IN INEQUALITIES IN CHILDHOOD STUNTING IN ETHIOPIA FROM 2000 TO 2016: A CROSS SECTIONAL STUDY.....	XII
PETROLEUM HYDROCARBON BIOREMEDIATION OF CONTAMINATED SOIL IN THARJITAH OIL FIELD SOUTH SUDAN .....	XIV
BIOTYPING OF CAMPYLOBACTER SPECIES RECOVERED FROM POULTRY AND HUMANS IN BAGHDAD PROVINCE/IRAQ.....	XV
APPLICATION OF SCREEN-DROP STRUCTURES AND ITS EFFECT ON HYDRAULIC CHARACTERISTICS OF FLOW .....	XVI
NUMERICAL SIMULATION EFFECT OF CUTOFF WALL BELOW IN CLAY CORE OF SABALAN ROCKFILL DAM WITH NON-ISOTROPIC PERMEABILITY FOUNDATION ...	XVII
<b>İÇİNDEKİLER / CONTENTS</b> .....	<b>XVIII</b>
<b>SÖZLÜ SUNUMLAR / ORAL PRESENTATIONS</b> .....	<b>1</b>
INVESTIGATION OF SHIP-BASED EMISSIONS IN THE BOSPHORUS .....	2
<i>İSTANBUL BOĞAZI GEMİ KAYNAKLI EMİSYONLARIN İNCELENMESİ</i> .....	2
IMPACT OF DROPLETS ON SURFACES WITH CHEMICAL HETEROGENEITIES .....	4
CLASSIFYING SEM IMAGES WITH CNN METHODOLOGY.....	5
EDUCATION OF SEM IMAGES WITH MACHINE LEARNING METHODOLOGY .....	6
TRAINING SEM IMAGES USING NANOTECHNOLOGY AND ARTIFICIAL INTELLIGENCE TECHNIQUES .....	7
8-HYDROXY-2-DEOXYGUANOSINE AS AN OXIDATIVE DNA DAMAGE PRODUCT .....	8
<i>BİR OKSİDATİF DNA HASAR ÜRÜNÜ OLARAK 8-HİDROKSİ-2-DEOKSİGUANOZİN</i> .....	8
SOME COMMON INHERITED DISEASES IN DOGS .....	9
<i>KÖPEKLERDE YAYGIN GÖRÜLEN BAZI KALITSAL HASTALIKLAR</i> .....	9
STORING MEDICAL INFORMATION THROUGH A BLOCK CHAIN BASED SYSTEM .....	10
DEVELOPMENT AND CHARACTERIZATION OF NANOHYDROXYAPATITE DOPED POLYMERIC NANOCOMPOSITE MEMBRANES .....	11
<i>NANOHİDROKSİAPATİT KATKILI POLİMERİK NANOKOMPOZİT MEMBRANLARIN GELİŞTİRİLMESİ VE KARAKTERİZASYONU</i> .....	12
INTEGRATION OF IMAGE PROCESSING TECHNIQUES IN HOLE SIZE AND LOCATION CONTROL IN FURNITURE ELEMENTS .....	13



<i>MOBİLYA ELEMANLARINDAKİ DELİK ÖLÇÜSÜ VE LOKASYON KONTROLÜNE GÖRÜNTÜ İŞLEME TEKNİKLERİNİN ENTEGRASYONU</i> .....	14
NANO ENHANCED PCMS FOR THERMAL AND ENERGETIC SYSTEMS .....	16
SHEET MATERIAL OPTIMIZATION .....	17
<i>SAC MALZEME OPTİMİZASYONU</i> .....	18
N-VINYL-2-PYRROLIDONE BASED HYDROGELS REINFORCED WITH MODIFIED SEPIOLITE .....	19
BIOINFORMATICS INVESTIGATION OF TAU PROTEINS WHICH HAVE A PLACE IN THE PATHOGENESIS OF NEURODEGENERATIVE DISEASES SUCH AS ALZHEIMER'S, DEMENTIA .....	21
<i>ALZHEİMER, DEMANS GİBİ NÖRODEJENERATİF HASTALIKLARIN PATOGENEZİNDE YER TUTAN TAU PROTEİNLERİNİN BİYOİNFORMATİK AÇIDAN İNCELENMESİ</i> .....	21
PHOTOVOLTAIC TECHNOLOGIES OF FLEXIBLE SOLAR PANELS FOR SELF CHARGING ELECTRIC VEHICLES .....	23
EFFECTS OF VARIABLE WALL SURFACE ENERGY ON THE MOTION OF SELF-DRIVEN INTERFACE IN A CAPILLARY MICROCHANNEL .....	24
MULTI-CLASS FEATURE SELECTION WITH METAHEURISTIC ALGORITHM THE CASE OF SIVRICE EARTHQUAKE.....	25
MULTI-OBJECTIVE EVOLUTIONARY ALGORITHM DAMAGE PREDICTION APPROACH FOR THE CASE OF SAMOS EARTHQUAKE.....	26
AIRCRAFT BRAKE INDUCED VIBRATIONS INVESTIGATION FOR GEAR-WALK AND BRAKE CHATTER PHENOMENA .....	27
COMPARISON OF TWO MAGNETIC STORMS OCCURRED IN SAME SOLAR ACTIVITY PERIOD.....	28
TRENDS IN INEQUALITIES IN CHILDHOOD STUNTING IN ETHIOPIA FROM 2000 TO 2016: A CROSS SECTIONAL STUDY.....	29
PRESCRIPTIVE ANALYTICS AND ADVANCED WORKFORCE MANAGEMENT FOR OPTIMIZED O&M OF SOLAR POWER PLANTS “PANAMA”.....	30
HYALURONIC ACID/BSA NANO-BIO COMPOSITE SYSTEMS AS POTENTIAL GREEN CARRIERS FOR SUPEROXIDE DISMUTASE/CATALASE COVALENT IMMOBILIZATION AS NOVEL BIOCATALYSTS: INCREASED REUSABILITY AND STABILITY .....	32



## SÖZLÜ SUNUMLAR / ORAL PRESENTATIONS

---



# SÖZLÜ SUNUMLAR ORAL PRESENTATIONS



## INVESTIGATION OF SHIP-BASED EMISSIONS IN THE BOSPHORUS

Araks Ekmekcioglu <sup>1\*</sup>, Ugur Bugra Celebi <sup>2</sup>

<sup>1</sup> Yıldız Technical University, Naval Architecture and Marine Engineering, Turkey

ORCID ID: 0000-0002-4821-0272, araks@yildiz.edu.tr

<sup>2</sup> Yıldız Technical University, Naval Architecture and Marine Engineering, Turkey

ORCID ID: 0000-0002-2658-1291, ucelebi@yildiz.edu.tr

\* Corresponding Author

### Abstract

The maritime sector is one of the sectors that pose a serious environmental risk due to its dependence on fossil fuels and the fact that ship operations are usually carried out in areas close to the coast. The International Maritime Organization (IMO) is the authorized institution for the reduction and prevention of ship-sourced emissions. The Marine Environment Protection Committee (MEPC) keeps the prevention of these emissions up-to-date and develops new regulations in line with changing conditions, considering the MARPOL 73/78 Convention with its meetings. In this context, it is important to examine the coastline where the settlement is located in our country in terms of emissions. Istanbul, the most populated city of the Republic of Turkey, is the country's largest city in terms of trade and economy. There are environmental threats posed by ships passing through the Bosphorus.

In this study, we calculated the amount of NO<sub>x</sub> - CO - HC - VOC - PM<sub>10</sub> - SO<sub>2</sub> - CO<sub>2</sub> pollutants emitted by ships passing through the Bosphorus in a 14-year period between 2009-2021. In the calculations, we used the United States Environmental Protection Agency (EPA) method based on the installed power of the ships (bottom-up). The emission amounts of a total of 575165 ships over a 14-year period were calculated and analyzed. With the results obtained, the contribution of maritime emissions to the Bosphorus emissions has been examined. In addition, the effects of low sulfur use, which came into force with the regulations in 2020, were also examined in the study. This study is a study that includes studies that will support the United Nations Sustainable Development Goals and IMO's 2022 green maritime theme in the field of maritime.

**Keywords:** *Emissions, Air Quality, Climate Change*

## İSTANBUL BOĞAZI GEMİ KAYNAKLI EMİSYONLARIN İNCELENMESİ

### Özet

Denizcilik sektörü, ağırlıklı olarak fosil yakıtlara olan bağıllığı ve gemi operasyonlarının genellikle kıyıya yakın bölgelerde gerçekleşmesi sebebiyle çevresel açıdan ciddi risk oluşturan sektörlerin başında gelmektedir. Gemi kaynaklı emisyonların azaltılması ve önlenmesi konularında yetkili olan kurum Uluslararası Denizcilik Örgütüdür (IMO). Deniz Çevresini Koruma Komitesi (MEPC) toplantılarıyla MARPOL 73/78 Sözleşmesi'ni dikkate alarak bu emisyonların önlenmesi konusunu sürekli güncel tutmakta ve değişen koşullara uygun olarak yeni düzenlemeler geliştirmektedir. Bu bağlamda ülkemizde yerleşimin bulunduğu kıyı şeridinin emisyon bakımından incelenmesi önemlidir. Türkiye Cumhuriyeti'nin nüfusu en fazla olan kenti İstanbul, ülkenin ticari ve ekonomik bakımdan en büyük şehridir. İstanbul Boğazı'ndan geçen gemilerin oluşturduğu çevresel tehditler mevcuttur.



Biz bu çalışmada 2009-2021 yılları arasında 14 yıllık periyotta İstanbul Boğazı'ndan geçen gemilerin yaydığı  $NO_x$  - CO – HC – VOC -  $PM_{10}$  -  $SO_2$  -  $CO_2$  kirletici miktarlarını hesaplanmıştır. Hesaplama Amerika Çevre Koruma Ajansı'nın gemilerin kurulu güçlerine bağlı (aşağıdan-yukarıya) yöntemi kullanılmıştır. Toplamda 575165 adet geminin 14 yıllık periyotta yaydığı emisyon miktarları hesaplanıp incelenmiştir. Elde edilen sonuçlar ile denizcilik kaynaklı emisyonların İstanbul boğazı emisyonlarına katkısı incelenmiştir. Ayrıca 2020'de regülasyonlar ile yürürlüğe giren düşük sülfür kullanımının etkileri de çalışmada irdelenmiştir. Bu çalışma denizcilik alanında Birleşmiş Milletler Sürdürülebilir Kalkınma Hedefleri, IMO'nun 2022 yılı yeşil denizcilik temasını destekleyecek çalışmalarını içeren bir çalışmadır.

**Anahtar Kelimeler:** *Emisyonlar, Hava Kalitesi, İklim Değişikliği*





## IMPACT OF DROPLETS ON SURFACES WITH CHEMICAL HETEROGENEITIES

Atalay Secer <sup>1</sup>\*, Umut Ceyhan <sup>2</sup>

<sup>1</sup> Graduate School of Natural and Applied Sciences, İzmir Katip Çelebi University, Türkiye

ORCID ID: 0000-0001-9944-3706, atalaysecer@outlook.com

<sup>2</sup> Department of Mechanical Engineering, İzmir Katip Çelebi University, Türkiye

ORCID ID: 0000-0003-0033-1013, umut.ceyhan@ikcu.edu.tr

\* Corresponding Author

### Abstract

When a droplet impacts onto a surface, it may simply deposit, rebound or splash depending on the surface properties and flow parameters. For example, while splashing is not desirable in ink-jet printing, it increases the performance of spraying applications in cooling or combustion processes. The understanding and control of this motion is crucial. The research in the effects of surface roughness and chemical structures on the deformation of impacting droplets is limited compared to the one on smooth surfaces [1-2]. We model the axisymmetric motion of droplets over surfaces having chemical heterogeneities using two-phase flow by coupling the Navier-Stokes equations of motion with the Cahn-Hilliard equation for the interface tracking. We integrate the governing equations using  $P2-P1$  triangular finite elements for velocity components and pressure, respectively; with  $P2$  elements for the phase field and chemical potential. Apart from the interpolation of viscosity and phase field, we discuss the effect of various density interpolation techniques for high density ratio fluids and suggest a new quadratic interpolant. We, first, consider the impact of droplets on flat substrates which are atomically smooth and chemically homogeneous and compare with experimental results for validation of our solver. Over uniform energy surfaces, the maximum spreading diameter,  $D_{max}$ , after impact has been shown, both theoretically and experimentally, to scale as  $D_0We^{1/4}$  in the capillary regime while as  $D_0Re^{1/5}$  in the viscous regime, where  $D_0$  is the initial droplet diameter,  $We$  is the Weber number and  $Re$  is the Reynolds number [3]. While the small  $We$  ensures less deformation, the surfaces, however, can be engineered in a way to control the deformation either by changing the roughness or its surface energy, at fixed  $We$ . We design a continuously varying wettability pattern and discuss how we can alter the deformation of impacting drops by playing with the chemical structure of the surfaces.

**Keywords:** Drop Impact, Wetting, Finite Element Method

### References

- [1] Yu, F., Yang, S., Yang, J., Fan, Y., Wang, D., Chen, L. and Deng, X., “Prompting Splash Impact on Superamphiphobic Surfaces by Imposing a Viscous Part”, *Advanced Science*, 7, 1902687, 2020.
- [2] Du, J., Wang, X., Li, Y. and Min, Q., “Maximum spreading of liquid droplets impact on concentric ring-textured surfaces: Theoretical analysis and numerical simulation”, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 630, 127647, 2021.
- [3] Clanet, C., Béguin, C., Richard, D. and Quéré, D., “Maximal deformation of an impacting drop”, *Journal of Fluid Mechanics*, 517, 199-208, 2004.



## CLASSIFYING SEM IMAGES WITH CNN METHODOLOGY

Ayşe Demirkan<sup>1\*</sup>, İsmail Topcu<sup>2</sup>

<sup>1</sup> Alanya Alaaddin Keykubat Üniversitesi, Lisansüstü eğitim Enstitüsü Nanobilim ve Nanomühendislik, Alanya Antalya, Türkiye

ORCID ID: 0000-0002-8403-7243, aedemirkan2@gmail.com

<sup>2</sup> Alanya Alaaddin Keykubat Üniversitesi Metalurji ve Malzeme Mühendisliği, Alanya Antalya, Türkiye

ORCID ID: 0000-0002-2998-6569, ismail.topcu@alanya.edu.tr

\* Corresponding Author

### Abstract

Today, technological systems have led to the beginning of the age of artificial intelligence, which can be integrated into many fields. The development of applications in the field of nanotechnology is possible if scientific studies can overlap with quantitative data. Especially working with different techniques of machine learning; It is necessary both to save time and to reach heuristic results with correct data.

10 different semantic categories were created from SEM (Scanning Electron Microscopy) data in order to be able to classify experimentally with the CNN (Convolutional Neural Network) method. Model accuracy rates were observed by creating values in matplotlib graphs. In addition, the SEM image was obtained with the function that gives the best result value. In the study, the CNN classification method, which is the image processing sub-branch of deep learning, which is the sub-step of machine learning technique from artificial intelligence methods, was used. SEM image training was carried out. The data used in the experiment phase; 22,000 SEM images are available for public access. These images were obtained as a result of the work of 100 scientists over 5 years with the ZEISS SUPRA 40 resolution instrument in the TASC laboratory of CNR-IOM in Trieste. In the selection of the data used; Emphasis is placed on image size and quality. 100 images in each dataset; It was created by selecting a total of 1000 images within 10 data sets. The Google Colab interface was used for the implementation of the experiment. The runtime is set to GPU (Graphics Processing Unit). Code entries used for experimental work in Python have been arranged. Subsequently, the “RELU-softmax” activation run and RMSprop optimization were used. The values of 25 and 100 are based on the training (epoch). Image classification result values were created with the CNN technique. Model accuracy rates were tabulated to compare the data results according to the level of fit with the training parameters. The best result value has been obtained.

The approach used here can be applied to a wide variety of nanoengineering situations. Appropriate parameters can be developed to solve certain properties of nanomaterials. The way to new methods and tools in application modules can contribute to paving the way for future studies that may occur in the field of artificial intelligence and nanotechnology.

**Keywords:** SEM, CNN, Nanotechnology, Machine Learning



## EDUCATION OF SEM IMAGES WITH MACHINE LEARNING METHODOLOGY

Ayşe Demirkan<sup>1\*</sup>, İsmail Topcu<sup>2</sup>

<sup>1</sup> Alanya Alaaddin Keykubat Üniversitesi, Lisansüstü eğitim Enstitüsü Nanobilim ve Nanomühendislik, Alanya Antalya, Türkiye

ORCID ID: 0000-0002-8403-7243, aedemirkan2@gmail.com

<sup>2</sup> Alanya Alaaddin Keykubat Üniversitesi Metalurji ve Malzeme Mühendisliği, Alanya Antalya, Türkiye

ORCID ID: 0000-0002-2998-6569, ismail.topcu@alanya.edu.tr

\* Corresponding Author

### Abstract

Machine learning, which takes place in developing areas today, learns from data; It is a branch of computational algorithms designed by imitating human intelligence. There are many techniques based on machine learning. These techniques vary in the form of pattern recognition, computer vision, spacecraft engineering, finance, and medical applications. The data used in the experimental part; is 22,000 SEM data available as public access. It was obtained as a result of the work of 100 scientists for 5 years with the ZEISS SUPRA 40 resolution device in the TASC laboratory of CNR-IOM in Trieste. 100 images selected from these data were manually selected in nano size. In total, 1000 image data were generated within 10 datasets.

After completing the code entry stage in the python library with machine learning for experimental work, these data with the "RELU-softmax" activation functions; with Adam's optimization = 0.000001, the epoch values were set to 25 and 100 to complete the training. The best result value was reached by tabulating the model accuracy rates in terms of classification according to the level of compliance of the data results with the training parameters.

The approach used here can be applied to various nanoengineering use cases. Considering the integration process of sciences, the classification of nano-sized materials with machine techniques can bring a different perspective to artificial intelligence education.

**Keywords:** Nanoengineering, Artificial Intelligence, SEM, Machine Learning



## TRAINING SEM IMAGES USING NANOTECHNOLOGY AND ARTIFICIAL INTELLIGENCE TECHNIQUES

Ayşe Demirkan<sup>1\*</sup>, İsmail Topcu<sup>2</sup>

<sup>1</sup> Alanya Alaaddin Keykubat Üniversitesi, Lisansüstü eğitim Enstitüsü Nanobilim ve Nanomühendislik, Alanya Antalya, Türkiye

ORCID ID: 0000-0002-8403-7243, aedemirkan2@gmail.com

<sup>2</sup> Alanya Alaaddin Keykubat Üniversitesi Metalurji ve Malzeme Mühendisliği, Alanya Antalya, Türkiye

ORCID ID: 0000-0002-2998-6569, ismail.topcu@alanya.edu.tr

\* Corresponding Author

### Abstract

We live in an age where technology, which gains momentum day by day, manifests itself in many areas. The increase in details creates a system in which artificial intelligence techniques that can be integrated with nanotechnology come to the fore in scientific studies. It consists of 22.000 SEM (Scanning Electron Microscopy) data, which is available to the public for the training of the images used in the experimental part. It is known that it was obtained as a result of the work of 100 scientists for 5 years with the ZEISS SUPRA 40 resolution device in the TASC laboratory of CNR-IOM in Trieste. In the experimental study, the data contained herein was chosen based on image quality. A total of 1000 images, with 100 image data in each image set, were created as 10 image sets. Then, the training of the data used in nanotechnology was provided by using artificial intelligence techniques.

The python library was used in the experimental study. "RELU-softmax" was used as a function. With the optimization of  $\text{man} = 0.000001$ , it was ensured that the training (epoch) was 10, 100, and 1000. By tabulating the data results; the interpretation of the best result value was made. These values are plotted with Matplotlib.

The use of artificial intelligence techniques in the field of nanotechnology has a key role in the next-generation structures in terms of product damage.

**Keywords:** Nanotechnology, Artificial Intelligence, SEM, Machine Learning, Matplotlib



## 8-HYDROXY-2-DEOXYGUANOSINE AS AN OXIDATIVE DNA DAMAGE PRODUCT

Beyza Suvarikli Alan <sup>1\*</sup>, Zafer Bulut <sup>2</sup>

<sup>1</sup> Selçuk University, Faculty of Veterinary Medicine, Department of Biochemistry, Turkey

ORCID ID: 0000-0003-4698-9291, beyza.alan@selcuk.edu.tr

<sup>2</sup> Selçuk University, Faculty of Veterinary Medicine, Department of Biochemistry, Turkey

ORCID ID: 0000-0003-1794-1651, zbulut@selcuk.edu.tr

\* Corresponding Author

### Abstract

The event that causes cell damage by causing changes on biological macromolecules such as lipids, proteins and DNA is defined as oxidative stress. Reactive Oxygen Species in DNA; causes some modifications such as single and double chain breaks. The formation of oxygen-derived free radicals in high amounts has negative effects on the building blocks of biological systems. 8-Hydroxy-2-Deoxyguanosine (8-OHdG) is the best known and the most frequently encountered mutagenicity of the Reactive Oxygen Species produced during oxidative metabolism from the damage product it causes to DNA. It has been reported that some diseases such as cardiovascular, chronic obstructive pulmonary diseases, old age, exposure to physical, chemical and biological substances may be associated with excessive 8-OHdG concentrations. It is clear that new studies will be beneficial for the use of 8-OHdG measurement as an auxiliary marker in the presymptomatic phase of diseases and in the treatment phase.

**Keywords:** 8-Hydroxy-2-Deoxyguanosine, DNA, Mutagen

## BİR OKSİDATİF DNA HASAR ÜRÜNÜ OLARAK 8-HİDROKSİ-2-DEOKSİGUANOZİN

### Özet

Lipidler, proteinler ve DNA gibi biyolojik makromoleküller üzerinde değişiklikler meydana getirerek hücre hasarına sebep olan olay oksidatif stres olarak tanımlanmaktadır. Reaktif Oksijen Türleri, DNA'da; tek ve çift zincir kırıkları gibi bazı modifikasyonlara neden olmaktadır. Oksijen türevi serbest radikallerin yüksek miktarda oluşmasında biyolojik sistemlerdeki yapı taşlarına olumsuz etkiler yapmaktadır. Oksidatif metabolizma sırasında üretilen Reaktif Oksijen Türlerinin, DNA'da yaptığı hasar ürününden mutajenitesi en iyi bilinen ve en sık karşılaşılanı 8-Hidroksi-2-Deoksiguanozin (8-OHdG) dir. Kardiyovasküler, kronik obstrüktif akciğer hastalıkları gibi bazı hastalıklar, yaşlılık, fiziksel, kimyasal, biyolojik maddelere maruz kalma gibi durumların aşırı 8-OHdG konsantrasyonları ile ilişkili olabileceği bildirilmiştir. 8-OHdG ölçümünün hastalıkların presemptomatik aşamasında ve tedavi aşamasında yardımcı belirteç olarak kullanımı için yeni yapılacak araştırmaların faydalı olacağı açıktır.

**Anahtar Kelimeler:** 8-Hidroksi-2-Deoksiguanozin, DNA, Mutajen



## SOME COMMON INHERITED DISEASES IN DOGS

**Beyza Suvarikli Alan<sup>1\*</sup>, Rana Karcaaltincaba<sup>2</sup>, Zafer Bulut<sup>3</sup>**

<sup>1</sup> Selçuk University, Faculty of Veterinary Medicine, Department of Biochemistry, Turkey

ORCID ID: 0000-0003-4698-9291, beyza.alan@selcuk.edu.tr

<sup>2</sup> Selçuk University, Faculty of Veterinary Medicine, Department of Biochemistry, Turkey

ORCID ID:0000-0002-9938-642X, rana.altincaba@gmail.com

<sup>3</sup> Selçuk University, Faculty of Veterinary Medicine, Department of Biochemistry, Turkey

ORCID ID: 0000-0003-1794-1651, zbulut@selcuk.edu.tr

\* Corresponding Author

### Abstract

Dogs are at the forefront of the animal species that are exposed to health problems, diseases and complications (although it varies according to the breed) due to hereditary disorders. Among these diseases, allergic skin disease is common in many dog breeds. Hip dysplasia, which can be seen in breeds such as German shepherds, rottweilers, bulldogs, Neapolitan mastiffs, and retrievers, is the most common musculoskeletal disorder. Brachycephalic obstructive airway syndrome is common in british, french bulldog, pug, pekingese etc. found in races. Cryptorchidism is common in mixed and purebred dogs. Canine degenerative myelopathy (CDM) is a painless disease in the German Shepherd that results in degeneration of the spinal nerves causing weakness in the hind legs. Epilepsy is inherited in some dog breeds such as German shepherd dogs, beagles, golden and labrador retrievers. In order to provide a definitive diagnosis for the aforementioned diseases and others, genetic screening is very important both to determine whether dogs are carriers and to take precautions.

**Keywords:** Dog, Hereditary, Disease

## KÖPEKLERDE YAYGIN GÖRÜLEN BAZI KALITSAL HASTALIKLAR

### Özet

Köpekler kalıtsal bozukluklardan dolayı sağlık sorunları, hastalıklar ve komplikasyonlara (ırklara göre değişmekle de birlikte) maruz kalan hayvan türlerinin başında gelmektedirler. Bu hastalıklardan alerjik cilt hastalığı birçok köpek ırkında yaygın olarak görülmektedir. Alman çobanlar, rottweiler, bulldoglar, napoliten mastiffler, retriever gibi ırklarda görülebilen kalça displazisi en yaygın kas-iskelet sistem bozukluğudur. Brakisefali obstrüktif havayolu sedromu ingiliz, fransız bulldog, pug, pekingese vb. ırklarda bulunur. Kriptorşidizm karışık ve safkan köpeklerde sıklıkla görülür. Dejeneratif miyelopati alman çoban köpeğinde arka bacaklarda zayıflığa neden olan omurilik sinirlerinin dejenerasyonu ile sonuçlanan ağrısız bir hastalıktır. Epilepsi alman çoban köpekleri, beagles, golden ve labrador retrieverler gibi bazı köpek ırklarında kalıtsal bir özellik göstermektedir. Bahsedilen hastalıklar ve diğerleri için kesin teşhis sağlamak amacıyla genetik taramaların yapılması hem köpeklerin taşıyıcı olup olmadıklarını belirlemek hem de önlem almak için oldukça önemlidir.

**Anahtar Kelimeler:** Köpek, Kalıtsal, Hastalık



## STORING MEDICAL INFORMATION THROUGH A BLOCK CHAIN BASED SYSTEM

Caner Songul<sup>1\*</sup>, Melih Oz<sup>2</sup>

<sup>1</sup> Akdeniz University, Institute of Natural and Applied Sciences, Turkey

ORCID ID: 000-0003-4855-841X, caner.songul92@gmail.com

<sup>2</sup> Akdeniz University, Institute of Natural and Applied Sciences, Turkey

ORCID ID: 0000-0003-2157-1788, melihoz@akdeniz.edu.tr

\* Corresponding Author

### Abstract

Health information is one of the most sensitive topics in the data-storing world. Providing reliable storing and sharing methods is crucial to create trustworthy service for patients. While current storage methods involve numerous linked systems, blockchain provides security and robustness to the data storage and reduces the infrastructure. Blockchain also provides consensus to sensitive data, ensuring data integrity and protecting the data from attackers. In this paper, examples of literature about storing medical data on blockchain systems and their implementations are discussed, and then our implementation of a blockchain-based medical data storage system is introduced, and preliminary results are shown. Our implemented blockchain application runs on Flask based web service. Patient data is stored in blocks of the blockchain. All data is encrypted with the SHA256 hash function for protection. Due to Encryption, patient data becomes immutable by blockchain technology, and this application improves cyber security in hospitals.

**Keywords:** *Blockchain, Medical Data, Cryptography, Health Technologies*



## DEVELOPMENT AND CHARACTERIZATION OF NANOHYDROXYAPATITE DOPED POLYMERIC NANOCOMPOSITE MEMBRANES

Tugba Sardohan Koseoglu <sup>1</sup>, Emine Gonen <sup>2\*</sup>, Hasan Koseoglu <sup>3</sup>

<sup>1</sup> Isparta University of Applied Sciences, Faculty of Technology, Department of Biomedical Engineering, Isparta, Turkey

ORCID ID: 0000-0002-0707-9191, tugbakoseoglu@isparta.edu.tr

<sup>2</sup> Isparta University of Applied Sciences, Faculty of Technology, Department of Biomedical Engineering, Isparta, Turkey

ORCID ID:0000-0001-7572-3543, emine.medicine@gmail.com

<sup>3</sup> Suleyman Demirel University, Faculty of Engineering, Department of Environmental Engineering, Isparta, Turkey

ORCID ID: 0000-0003-0183-208X, hasankoseoglu@sdu.edu.tr

\* Corresponding Author

### Abstract

The membrane technology is used in many fields, especially in chemistry, pharmacy, medicine, biomedical, environmental, and food engineering. This study is aimed to develop new types of polymeric nanocomposite membranes, to be used for biomaterial purposes by using membrane technology. For this purpose, polymeric nanocomposite membranes were prepared by combining various polymers that are used in biological applications (polymethylmethacrylate (PMMA), polysulfone (PS), polyvinyl alcohol (PVA)) with nanohydroxyapatite (nHA), which can also be used as a bone substitute. It was observed that the nHA obtained was in the nanostructure by SEM images (Figure 1).

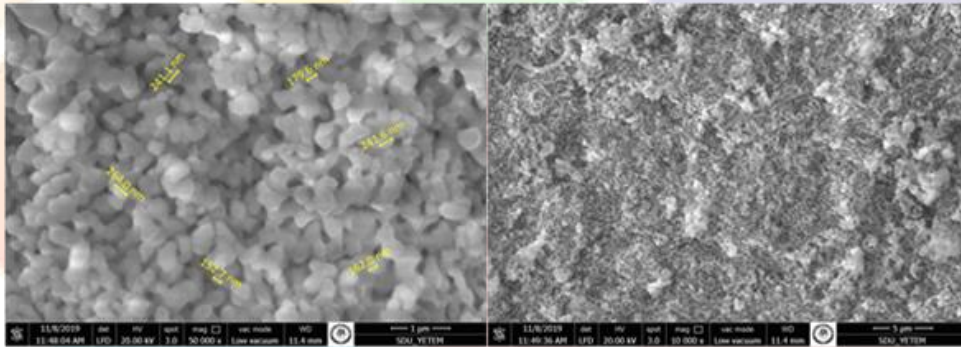


Figure 1: SEM image of synthesized nHA

The preparation of the membranes was performed by the phase inversion method. PMMA, PS, and PVA polymers, which are frequently used in orthopedics, are mixed in a suitable solvent at a controlled temperature and homogeneously dissolved. The crosslinker polyvinylpyrrolidone (PVP) was mixed in dimethylformamide (DMF) at a certain temperature until it dissolved homogeneously. Both homogeneous solutions were slowly combined and mixed. Certain amounts (1%, 3%, 5%, 7%) of the prepared nanohydroxyapatite were added to the prepared solution. The solution was spread on a glass plate and left to dry at room temperature. After 12 hours, the layer that dried on the glass plate was left in a container filled with distilled water to allow it to solidify and separate from the glass surface. Membranes were stored in distilled water at 4 °C. Characterization processes (FTIR, SEM, SEM-EDS, XRD, AFM) of the prepared polymeric nanocomposite membranes were performed. It is thought that the prepared polymeric nanocomposite membrane material can be used





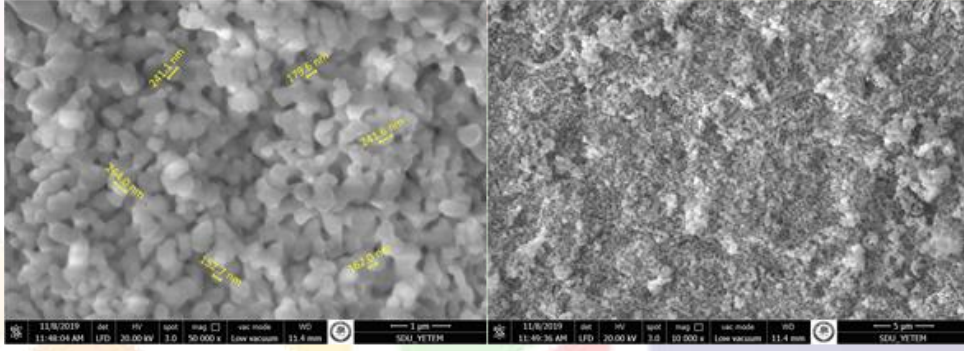
in the field of orthopedy after the necessary tests are done due to the similarity of the hydroxyapatite in the content of the prepared membranes to the bone structure.

**Keywords:** *Characterization, Membrane, Nanohidroksiapatit, Polimerik kompozit.*

## NANOİDROKSİAPATİT KATKILI POLİMERİK NANOKOMPOZİT MEMBRANLARIN GELİŞTİRİLMESİ VE KARAKTERİZASYONU

### Özet

Membran teknolojisi kimya, eczacılık, tıp, biyomedikal, çevre ve gıda mühendislikleri başta olmak üzere birçok alanda kullanılmaktadır. Bu çalışmada, membran teknolojisini kullanarak biyomalzeme amaçlı kullanılabileceği düşünülen yeni tür polimerik nanokompozit membranların geliştirilmesi amaçlanmıştır. Bu amaçla, biyolojik uygulaması olan bazı polimerlerin (polimetilmetakrilat (PMMA), polisülfon (PS), polivinil alkol (PVA)) yine kemik yerine kullanılabilecek özelliğe sahip olan nanohidroksiapatit (nHA) ile bir araya getirilmesi ile polimerik nanokompozit membranlar hazırlanmıştır. Elde edilen nHA'nın nanoyapıda olduğu SEM görüntüsü ile görülmüştür (Şekil 1).



Şekil 1: Sentezlenen nHA'nın SEM görüntüsü

Membranların hazırlanması faz inversiyon metodu kullanılarak gerçekleştirilmiştir. Ortopedi alanında sıklıkla kullanılan PMMA, PS, PVA polimerlerinin uygun çözücüde kontrollü bir sıcaklıkta homojen bir şekilde çözünmesi sağlanmıştır. Çapraz bağlayıcı olan polivinilpirolidon (PVP), dimetilformamid (DMF) içinde belirli bir sıcaklıkta homojen oluncaya kadar karıştırılmış ve çözünmesi sağlanmıştır. Her iki homojen çözelti yavaş yavaş birleştirilerek karıştırılmıştır. Çözeltiye hazırlanan nanohidroksiapatitten belirli miktarlarda (%1, %3, %5, %7) eklenmiştir. Ardından, cam bir plaka üzerine yayılarak oda sıcaklığında kurumaya bırakılmıştır. 12 saat sonra cam plaka üzerinde kuruyan tabaka, saf su dolu bir kabın içine bırakılarak katılmasında ve cam yüzeyden ayrılması sağlanmıştır. Membranlar saf su içinde 4 °C'de muhafaza edilmiştir. Hazırlanan polimerik nanokompozit membranların karakterizasyon işlemleri (FTIR, SEM, SEM-EDS, XRD, AFM) yapılmıştır. Hazırlanan membranların içeriğindeki hidroksiapatitin kemik yapısına benzerliği nedeniyle hazırlanan polimerik nanokompozit membran malzemesinin gerekli testler yapıldıktan sonra ortopedi alanında kullanılabileceği düşünülmektedir.

**Anahtar Kelimeler:** *Nanohidroksiapatit, Polimerik kompozit, Membran, Karakterizasyon.*



## INTEGRATION OF IMAGE PROCESSING TECHNIQUES IN HOLE SIZE AND LOCATION CONTROL IN FURNITURE ELEMENTS

Erkan Bayir <sup>1\*</sup>, Murat Bulca <sup>2</sup>, Sezer Selim <sup>3</sup>, Betül Kılıç <sup>4</sup>, Erdal Karabulut <sup>5</sup>

<sup>1</sup> Çilek Mobilya A.Ş., Bursa, Türkiye

ORCID ID: 0000-0002-0572-3094, erkan.bayir@cilek.com

<sup>2</sup> Çilek Mobilya A.Ş., Bursa, Türkiye

ORCID ID: 0000-0001-7871-3308, murat.bulca@cilek.com

<sup>3</sup> Çilek Mobilya A.Ş., Bursa, Türkiye

ORCID ID: 0000-0002-1567-4169, sezer.selim@cilek.com

<sup>4</sup> Çilek Mobilya A.Ş., Bursa, Türkiye

ORCID ID: 0000-0001-9430-8089, betul.kilic@cilek.com

<sup>5</sup> Çilek Mobilya A.Ş., Bursa, Türkiye

ORCID ID: 0000-0003-3843-6638, erdal.karabulut@cilek.com

\* Corresponding Author

### Abstract

Today, technology is evolving rapidly. Every day, different methods and techniques are entered into human life, especially the use of computer technologies are common in all areas. This is naturally reflected in the furniture industry, and it is possible to use computer technologies on many steps of modern furniture manufacturing processes. One of the most important developments in computer science research is image processing. Image processing is a method that is developed to perform some purposeful improvements by converting an image of an object into a digital format. Image processing techniques are used in many different areas. Today, image processing techniques are widely used in the medical field to perform vascular analysis, in the military for target recognition or tracking, in the security field for face recognition and motion detection, and in the industrial field for counting objects or quality control.

After drilling on furniture elements produced in the strawberry furniture production line, the location and measurement conformity of the holes are checked manually by the operator operating in the relevant unit according to the technical drawings. The hole location check is carried out using a tape measure for the horizontal (X) and vertical (Y) distance of the element surfaces of the holes and a caliper for hole depth measurements. The time required for hole location and measurement control varies according to the competence of the operator and number of holes in the controlled element. The accuracy of the measurement is completely dependent on the operator, so incorrect hole operations on the element occur during the assembly phase. In this case, the faulty components are either forced to rework or eliminated as a fire. This manual and operator-dependent operation within the manufacturing process has a technical and economic impact on the production process.

In this study, it is aimed to develop a system that can check the location and measurement of the holes in the fabricated furniture components using the image processing method, thus improving the production process. For this purpose, a control unit is installed and integrated into the system that operates with image processing in the area of the hole machines within the production line. In this system, the first element processed on the machine is positioned on the green floor, taking a photo with a high-resolution camera. After taking a photo, the opencv library is provided with element



dimensions and hole coordinates. By comparing element dimensions and holes according to the technical drawing, operators are able to achieve immediate results. With the method developed and integrated into the system, control of hole machines is started independently of the operator. The use of tape measure and caliper has been eliminated and the labor costs of the employee have been reduced by reducing preparation times. In addition, it has been ensured that the puncture errors that may occur in the components are immediately detected, preventing all components from being thrown or reprocessed. In the scope of the study, the integration of the image processing method into the production system has improved the performance of the production process, resulting in a cost and workforce gain.

**Keywords:** *Furniture, furniture manufacturing, image processing techniques, hole machine.*

## MOBİLYA ELEMANLARINDAKİ DELİK ÖLÇÜSÜ VE LOKASYON KONTROLÜNE GÖRÜNTÜ İŞLEME TEKNİKLERİNİN ENTEGRASYONU

### Özet

Günümüzde teknoloji hızla gelişmekte, insan hayatına her gün birbirinden farklı yöntem ve teknikler girmekte, özellikle de bilgisayar teknolojilerinin kullanımı her alanda yaygınlaşmaktadır. Bu durum, doğal olarak mobilya endüstrisine de yansımakta ve modern mobilya üretim süreçlerinin birçok basamağında bilgisayar teknolojilerinin kullanımı mümkün olmaktadır. Bilgisayar bilimleri araştırmaları alandaki en önemli gelişmelerden bir tanesi görüntü işleme tekniğidir. Görüntü işleme, bir nesnenin görüntüsünün dijital biçime dönüştürülerek amaca uygun bazı iyileştirme işlemleri gerçekleştirmek için geliştirilmiş bir metottur. Görüntü işleme teknikleri pek çok farklı alanlarda kullanılmaktadır. Günümüzde, damar analizleri yapmak için tıp alanında, hedef tanımak veya izlemek için askeri alanda, yüz tanıma ve hareket algılamak için güvenlik alanında, nesnelere sayılması veya kalite kontrol için endüstri alanında görüntü işleme tekniklerinden yaygın olarak yararlanılmaktadır.

Çilek Mobilya A.Ş. üretim hattında, üretilen mobilya elemanlarında delik işlemleri gerçekleştirdikten sonra, deliklerin lokasyon ve ölçü uygunluğu kontrolü teknik çizimlere göre ilgili birimde çalışan operatör tarafından manuel bir şekilde yapılmaktadır. Delik lokasyon kontrolü, deliklerin eleman yüzeylerinin yatay (X) ve dikey (Y) eksenindeki mesafeleri için şerit metreyle, delik derinlik ölçüleri için ise kumpas yardımıyla yapılmaktadır. Delik lokasyonu ve ölçü kontrolü için gereken süre, operatörün yetkinliğine ve kontrol edilen elemandaki delik sayısına göre değişkenlik göstermektedir. Yapılan ölçümün doğruluğu, tamamen operatöre bağlı olduğundan eleman üzerindeki hatalı delik işlemleri montaj aşamasında ortaya çıkmakta, bu durumda, hatalı elemanlar ya tekrar işlem görmek zorunda kalmakta ya da fire olarak elenmektedir. Üretim süreci içerisindeki bu manuel ve operatöre bağlı olan işlem, üretim sürecini teknik ve ekonomik açıdan olumsuz etkilemektedir.

Bu çalışmada, üretilen mobilya elemanlarındaki deliklerin lokasyon ve ölçü kontrolünü görüntü işleme metodu kullanılmak suretiyle yapabilecek bir sistem geliştirilmesi ve bu sayede de üretim sürecinin iyileştirilmesi amaçlanmıştır. Bu maksatla, üretim hattı içerisinde delik makinelerinin bulunduğu alana görüntü işleme tekniğiyle çalışan bir kontrol ünitesi yerleştirilmiş ve sisteme entegre edilmiştir. Bu sistemde, makinede işlenen ilk eleman yeşil zemin üzerinde konumlandırılarak yüksek çözünürlüklü bir fotoğraf makinesi ile fotoğrafı çekilmektedir. Fotoğraf çekimi yapıldıktan sonra, opencv kütüphanesine eleman ölçüleri ve delik koordinatlarının yazılması sağlanmaktadır. Teknik çizime göre eleman ölçüleri ve deliklerin karşılaştırılması yapılarak operatörlerin anlık olarak sonuçlara ulaşabilmesi sağlanmaktadır. Geliştirilen ve sisteme entegre edilen bu yöntemle, delik makinelerindeki kontrol işlemi operatörden bağımsız bir şekilde yapılmaya başlanmış, şerit metre ve kumpas kullanımı ortadan kaldırılmış ve hazırlık süreleri



azaltılarak eleman işçilik maliyetleri düşürülmüştür. Ayrıca, elemanlarda gerçekleştirilecek delik hatalarının anlık olarak tespit edilmesi sağlanarak, tüm elemanların fireye ayrılması veya tekrar işlem görmesinin önüne geçilmiştir. Çalışma kapsamında, görüntü işleme metodunun üretim sistemine entegrasyonu sayesinde maliyet ve iş gücünden kazanç sağlanarak üretim sürecinin performansı artırılmıştır.

**Anahtar Kelimeler:** *Mobilya, mobilya üretimi, görüntü işleme teknikleri, delik makinesi.*



## NANO ENHANCED PCMS FOR THERMAL AND ENERGETIC SYSTEMS

**Fateh Mebarek-Oudina**

*Department of Physics, Faculty of Sciences, University of 20 Août 1955-Skikda, Skikda 21000, Algeria*

*f.mebarek\_oudina@univ-skikda.dz*

### Abstract

The excellent thermo-physical characteristics of the nanoparticles greatly affected the behavior of the PCM, ensuing in improved thermal performance. For this Nano enhanced PCMs are considered as excellent options for thermal and energetic systems. PCMs attested to be valuable and drew the attention of diverse scientists striving to start novel methods. This work provides an overall overview on how to overcome those constrains via adapting nano enhanced phase change materials. Latest computational and experimental studies have revealed that nanoparticles <sup>[1-7]</sup> are very helpful in terms of improving the thermo-physical properties of PCMs, allowing Nano-PCMs, mainly nano-paraffin, to have a major positive impact on thermal concepts at the ecological, economical, and effectiveness levels. Further research revealed that temperature management is also provided by the combination of nanoparticles and PCMs, which ensures thermal comfort at a very low cost.

**Keywords :** *Thermal systems enhancement; Nano-PCMs; Thermal management.*

### References

- [1] B. V. Pushpa, M. Sankar, F. Mebarek-Oudina, Buoyant convective flow and heat dissipation of Cu-H<sub>2</sub>O nanoliquids in an annulus through a thin baffle, *Journal of Nanofluids*,10 (2) (2021) 292-304; <https://doi.org/10.1166/jon.2021.1782>
- [2] K. Dhif, F. Mebarek-Oudina, S. Chouf, H. Vaidya and Ali J. Chamkha, Thermal Analysis of the Solar Collector Cum Storage System using a Hybrid-Nanofluids, *Journal of Nanofluids*,10 (4), (2021) 634–644; <https://doi.org/10.1166/jon.2021.1807>
- [3] Shafiq, F. Mebarek-Oudina, T. N. Sindhu and Rassoul, G., Sensitivity analysis for Walters' B nanoliquid flow over a radiative Riga surface by RSM, *Scientia Iranica*, 2022, 29 (3), 1236-1249, <https://doi.org/10.24200/SCI.2021.58293.5662>
- [4] I. Chabani, F. Mebarek-Oudina, H. Vaidya, and A. I. Ismail, Numerical analysis of magnetic hybrid Nano-fluid natural convective flow in an adjusted porous trapezoidal enclosure, *Journal of Magnetism and Magnetic Materials*, 2022, 564 (2), 170142. <https://doi.org/10.1016/j.jmmm.2022.170142>
- [5] Y. D. Reddy, F. Mebarek-Oudina, B. S. Goud, A. I. Ismail, Radiation, Velocity and Thermal Slips Effect Toward MHD Boundary Layer Flow Through Heat and Mass Transport of Williamson Nanofluid with Porous Medium, *Arabian Journal for Science and Engineering*, 2022, 47(12), 16355–16369.. <https://doi.org/10.1007/s13369-022-06825-2>
- [6] F. Mebarek-Oudina, Convective Heat Transfer of Titania Nanofluids of different base fluids in Cylindrical Annulus with discrete Heat Source, *Heat Transfer-Asian Research*, 48(2019) 135-147. (Wiley, ISI) <https://doi.org/10.1002/htj.21375>
- [7] F. Mebarek Oudina, & I. Chabani, Review on Nano-fluids applications and heat transfer enhancement techniques in different enclosures, *Journal of Nanofluids*, 11(2),155-168, 2022. <https://doi.org/10.1166/jon.2022.1834>



## SHEET MATERIAL OPTIMIZATION

**Hilal Kir<sup>1\*</sup>, Timucin Kale<sup>2</sup>, Mehmet Selim Oda<sup>3</sup>, Sukru Talas<sup>4</sup>**

<sup>1</sup> *Uludag University, Department of Mechanical Engineering, Turkey*

*ORCID ID: 0000-0002-9623-4738, hilalkir16@gmail.com*

<sup>2</sup> *R&D Center, Şahinkul Machine and Spare Parts Production Ltd. Co., Bursa, Turkey*

*ORCID ID: 0000-0003-3891-9373, timucin.kale@sahinkulmakina.com.tr*

<sup>3</sup> *R&D Center, Şahinkul Machine and Spare Parts Production Ltd. Co., Bursa, Turkey*

*ORCID ID: 0000-0002-4520-3050, mehmetselim.oda@sahinkulmakina.com.tr*

<sup>4</sup> *Afyon Kocatepe University, Department of Metallurgical and Materials Engineering, Turkey*

*ORCID ID: 0000-0002-4721-0844, stalas@aku.edu.tr*

*\* Corresponding Author*

### Abstract

Energy efficiency is one of the most important issues in today's production conditions. For sustainable production, currently used manufacturing methods and product topologies are evaluated. Optimization studies are carried out on products and/or production methods with finite element analysis methods that have developed in recent years. Providing energy savings, it is aimed to reduce cost losses and harmful gas emissions such as CO<sub>2</sub> released to the environment. In this study optimized the production processes of a part used in the automotive industry, manufactured with sheet metal forming operations. The product, whose process steps are optimized, is manufactured from 0.65 mm thick, low carbon zinc coated steel sheet material. An optimization study was carried out with the Autoform program. The constraints were determined before the study. The part geometry, thickness, volume and weight parameters were stabled. It is aimed to save on scrap material, production time and labor costs by reducing the process steps of the part. It is a constraint that the production quality of the part does not decrease during this process. While the part was produced with five operations before the analysis study, it was reduced to four operations as a result of the optimization study. In the current process, the part is cut from the trapezoidal band in the first operation. As a result of the analyzes made with the Autoform program, it was decided to cut the first process in the blanking sheet metal geometry from the sheet roll. Depending on this process, the subsequent operations of the part were also evaluated with the analysis program. Formability analyzes of the optimized and non-optimized parts were evaluated with the Forming Limit Diagram (FLD) and Spring Back results. As a result of the optimization study, it was determined that when the part was produced in four operations, the thickening rate of the material increased, but there was no excessive thinning and tearing. The analysis results showed that the material could be produced with four operations. At the end of the study, 30% of material savings were achieved depending on the production numbers with process optimization.

**Keywords:** *Optimization, Autoform, Sheet Metal Forming*



## SAC MALZEME OPTİMİZASYONU

### Özet

Günümüz üretim koşullarında enerji verimliliği en önemli konulardan biridir. Sürdürülebilir üretim için mevcutta kullanılan imalat yöntemleri ve ürün topolojileri değerlendirilmektedir. Son yıllarda hızla gelişen sonlu elemanlar analiz yöntemleriyle ürünlerin ve/veya üretim yöntemlerinin üzerinde optimizasyon çalışmaları yapılmaktadır. Enerji tasarrufunun sağlanması ile maliyet kayıpları ve çevreye salınan CO<sub>2</sub> gibi zararlı gaz salınımlarının düşürülmesi amaçlanmaktadır. Bu çalışmada otomotiv sanayinde kullanılan, sac metal şekillendirme operasyonlarıyla imal edilen bir parçanın üretim prosesleri optimize edilmiştir. Proses adımları optimize edilen ürün, 0,65 mm kalınlığında, düşük karbonlu çinko ile kaplanmış çelik sac malzemeden imal edilmektedir. Optimizasyon çalışması, Autoform programı ile gerçekleştirilmiştir. Yapılan çalışma öncesinde kısıtlar belirlenmiş olup, parça geometrisi, kalınlık, hacim ve ağırlık parametreleri sabittir. Parçanın proses adımları azaltılarak hurda malzeme, üretim süresi ve işçilik maliyetlerinden kazanç sağlanması amaçlanmıştır. Bu işlem sırasında parçanın üretim kalitesinin düşmemesi bir kısıttır. Analiz çalışması öncesinde parça beş operasyonla üretilirken optimizasyon çalışması sonucunda dört operasyona düşürülmüştür. Mevcut proseste parça, birinci operasyonda trapez banttan kesilmektedir. Autoform programıyla yapılan analizler sonucu, ilk prosesin sac rulodan açınım geometrisinde kesilmesine karar verilmiştir. Bu işleme bağlı olarak parçanın sonraki operasyonları da analiz programı ile değerlendirilmiştir. Optimize edilmiş ve optimize edilmemiş parçanın şekillendirilebilirlik analizleri Şekillendirme Limit Eğrisi (FLD) ve Geri Yaylanma sonuçları ile değerlendirilmiştir. Optimizasyon çalışması sonucunda parçanın dört operasyonda üretildiğinde, malzemede kalınlaşma oranının arttığı ancak aşırı incelme ve yırtılmanın olmadığı tespit edilmiştir. Analiz sonuçları malzemenin dört operasyonla üretilebilirliğini göstermiştir. Çalışma sonunda proses optimizasyonu ile üretim adetlerine bağlı olarak %30 malzeme kazancı sağlanmıştır.

**Anahtar Kelimeler:** *Optimizasyon, Autoform, Sac Metal Şekillendirme*



## **N-VINYL-2-PYRROLIDONE BASED HYDROGELS REINFORCED WITH MODIFIED SEPIOLITE**

**Mehmet Yurttadur<sup>1</sup>, Gulcihan Guzel Kaya<sup>2</sup>, Huseyin Deveci<sup>3\*</sup>**

<sup>1</sup> *Konya Technical University, Chemical Engineering, Turkey*

*yurttadurmehmet@gmail.com*

<sup>2</sup> *Konya Technical University, Chemical Engineering, Turkey*

*ORCID ID: 0000-0003-2753-7724, ggkaya@ktun.edu.tr*

<sup>3</sup> *Konya Technical University, Chemical Engineering, Turkey*

*ORCID ID: 0000-0002-1103-7234, hdeveci@ktun.edu.tr*

*\* Corresponding Author*

### **Abstract**

Hydrogels are three dimensional network of natural/synthetic polymers. Due to hydrophilic groups such as –OH, CONH-, –CONH<sub>2</sub> and –SO<sub>3</sub>H in the network, hydrogels can absorb large amount of water [1]. Depending on different parameters, hydrogels can be classified: response (pH, glucose, enzyme, antigen, temperature, pressure, light, electric and magnetic field), cross-linking (physically and chemically cross-linked), preparation (copolymeric, homopolymeric and interpenetrating), ionic charge (cationic, anionic and nonionic) and degradability (biodegradable and nonbiodegradable) [2]. Hydrogels with the advantages of functionality, reversibility and biocompatibility are promising materials in the applications of tissue engineering, drug delivery, biosensor, fertilizer and agriculture [3].

Hydrogels reinforced with dispersed clays have become popular composite materials in recent years. Incorporation of different types of clays including kaolin, montmorillonite, sepiolite and bentonite into the hydrogel network generally provides an increase in mechanical strength and swelling ratio of the hydrogels as well as synergistic effects on their rheological properties [4]. To achieve better compatibility between hydrogel network and clays, clay modification is generally conducted using alkyl ammonium salts or polymeric materials [5].

In this study, *N*-vinyl-2-pyrrolidone based hydrogels were synthesized by free-radical polymerization. With the incorporation of tetramethylammonium chloride modified sepiolite as a filler, hydrogel composites were prepared. Effect of filler loading on the swelling properties of the hydrogel composites was investigated under different pH and temperature conditions. The highest swelling percent of the hydrogel composite including 1% filler was determined as about 1800% at pH 9. An increase in water temperature had synergistic effects on the swelling properties of the hydrogel composites. X-ray diffraction analyses showed that the hydrogel composites have amorphous structure. Chemical bonding of the hydrogel composites was examined by Fourier transform infrared spectroscopy analyses. Morphological characterization of the hydrogel composites was carried out by scanning electron microscopy analyses. Thermogravimetric analyses indicated that thermal stability of the hydrogel composites was enhanced in the presence of modified filler.

The results showed that the hydrogel composites which were pH and temperature responsive materials can be used in various fields such as biomedical applications and agricultural industry.

**Keywords:** *N*-vinyl-2-pyrrolidone, hydrogel, modified sepiolite





## References

- [1] F. Ullah, M.B.H. Othman, F. Javed, Z. Ahmad, H.M. Akil, Classification, processing and application of hydrogels: A review, *Materials Science and Engineering: C*, 57 (2015) 414-433.
- [2] M.M. Khansari, L.V. Sorokina, P. Mukherjee, F. Mukhtar, M.R. Shirdar, M. Shahidi, T. Shokuhfar, Classification of Hydrogels Based on Their Source: A Review and Application in Stem Cell Regulation, *JOM*, 69 (2017) 1340-1347.
- [3] W.A. Laftah, S. Hashim, A.N. Ibrahim, Polymer Hydrogels: A Review, *Polymer-Plastics Technology and Engineering*, 50 (2011) 1475-1486.
- [4] F. Zhang, Z. Guo, H. Gao, Y. Li, L. Ren, L. Shi, L. Wang, Synthesis and Properties of Sepiolite/poly (acrylic acid-co-acrylamide) Nanocomposites, *Polymer Bulletin*, 55 (2005) 419-428.
- [5] K.A.B. Pereira, K.L.N.P. Aguiar, P.F. Oliveira, B.M. Vicente, L.G. Pedroni, C.R.E. Mansur, Synthesis of Hydrogel Nanocomposites Based on Partially Hydrolyzed Polyacrylamide, Polyethyleneimine, and Modified Clay, *ACS Omega*, 5 (2020) 4759-4769.



## BIOINFORMATICS INVESTIGATION OF TAU PROTEINS WHICH HAVE A PLACE IN THE PATHOGENESIS OF NEURODEGENERATIVE DISEASES SUCH AS ALZHEIMER'S, DEMENTIA

Hudanur Demir <sup>1\*</sup>, Esmâ Eryılmaz Dogan <sup>2</sup>

<sup>1</sup> Selcuk University, Biomedical Engineering, Turkey

ORCID ID: 0000-0002-9809-7757, hudanurdemir16@hotmail.com

<sup>2</sup> Selcuk University, Biomedical Engineering, Turkey

ORCID ID: 0000-0001-6809-7513, eeryilmaz@selcuk.edu.tr

\* Corresponding Author

### Abstract

Tau proteins are proteins that ensure the normal functioning of microtubules by playing a role in maintaining the stability and organization of microtubules, which are cytoskeletal proteins. In the human brain, tau proteins are a protein belonging to the MAPT (Microtubule-Associated Protein Tau) family, which is encoded by chromosome 17 and has 6 isoforms. One of the causes of some neurodegenerative diseases such as Alzheimer's disease is the formation of NFY (Neurofibrillary tangles) within the cell. Hyperactive kinases and/or hypoactive phosphatases cause hyperphosphorylation of tau protein. As a result, the ability of tau proteins to bind to microtubules is impaired. Unbound phosphorylated tau protein polymerizes into insoluble double-stranded filaments, which eventually become neurofibrillary tangles. NFYs accumulating in neurons can lead to the destruction of neurons and cause neuronal loss. Because tau proteins are the main components of neurofibrillary tangles, they have an important role in the pathogenesis of various neurodegenerative diseases such as Alzheimer's, Dementia, and Parkinson's. In this study, microtubule-associated tau protein and its mutations were investigated. By using various bioinformatics tools, it is aimed to characterize the tau protein with bioinformatic tools by carrying out studies such as investigating the properties of the protein of interest, examining the sequence and structure of the protein, identifying mutations, examining and modeling its three-dimensional structure. In this way, it is aimed to accelerate the understanding of such diseases and to shed light on the treatment processes by performing bioinformatic analysis of tau proteins, which have an important place for various neurodegenerative diseases. Considering that these in silico studies, which were carried out using bioinformatic tools, will be of great importance in terms of speed, efficiency and cost in laboratory work processes, clinical studies and drug discovery processes, it is aimed to contribute to such studies and biotechnological drug technologies.

**Keywords:** *Bioinformatics, Neurodegenerative diseases, Neurofibrillary tangles, Tau protein*

## ALZHEİMER, DEMANS GİBİ NÖRODEJENERATİF HASTALIKLARIN PATOGENEZİNDE YER TUTAN TAU PROTEİNLERİNİN BİYOİNFORMATİK AÇIDAN İNCELENMESİ

### Özet

Tau proteinleri, hücre iskeleti proteinlerinden olan mikrotübüllerin stabilitesini korumasında ve organizasyonunda rol alarak, mikrotübüllerin normal bir şekilde çalışmasını sağlayan proteinlerdir. İnsan beyinde tau proteinleri, 17. kromozom tarafından kodlanan MAPT (Mikrotübül-İlişkili Protein Tau) ailesine ait bir proteindir ve 6 izoformu bulunmaktadır. Alzheimer hastalığı gibi bazı



nörodejeneratif hastalıkların oluşum sebeplerinden biri hücre içinde NFY (Nörofibriler yumaklar) oluşmasıdır. Hiperaktif kinazlar ve/veya hipoaktif fosfatazlar tau proteininin hiperfosforilasyonuna yol açmaktadır. Bunun sonucunda da tau proteinlerinin mikrotübüllere bağlanma yeteneği bozulmaktadır. Bağlanmamış fosforilize tau proteini çözölemeyen çift sarmallı iplikçiklere (filament) polimerize olur ve bunlar zamanla Nörofibriler yumaklar haline gelirler. Nöronlar içerisinde biriken NFY' ler nöronların tahribatına yol açarak nöron kaybına sebebiyet verebilirler. Tau proteinleri Nörofibriler yumakların temel bileşeni olduklarından dolayı Alzheimer, Demans, Parkinson gibi çeşitli nörodejeneratif hastalıkların patogeneğinde önemli role sahiptir. Bu çalışmada, mikrotübül-ilişkili tau proteini ve mutasyonları incelenmiştir. Çeşitli biyoinformatik araçları kullanarak, ilgilenilen proteinin özelliklerinin araştırılması, proteinin dizisi ve yapısının incelenmesi, mutasyonların belirlenmesi, üç boyutlu yapısının incelenmesi ve modellenmesi gibi çalışmaları gerçekleştirerek tau proteininin biyoinformatik araçlarla karakterizasyonu amaçlanmıştır. Bu şekilde çeşitli nörodejeneratif hastalıklar için önemli bir yere sahip olan tau proteinlerinin biyoinformatik açıdan analizinin gerçekleştirilmesiyle bu tarz hastalıkların anlaşılmasının hızlandırılması ve tedavi süreçlerine ışık tutulması hedeflenmektedir. Biyoinformatik araçlar kullanarak gerçekleştirilmiş olan bu in silico çalışmaların, laboratuvar çalışma süreçlerinde, klinik çalışmalarında ve ilaç keşif sürecinde hız, verimlilik ve maliyet açısından büyük bir önem arz edeceği düşünülerek bu tarz çalışmalara ve biyoteknolojik ilaç teknolojileri alanlarına katkı sağlamak amaçlanmaktadır.

**Anahtar Kelimeler:** *Biyoinformatik, Nörodejeneratif hastalıklar, Nörofibriler yumaklar, Tau proteini*



## PHOTOVOLTAIC TECHNOLOGIES OF FLEXIBLE SOLAR PANELS FOR SELF CHARGING ELECTRIC VEHICLES

Mehmet Murat Tezcan <sup>1\*</sup>, Ayca Akkaya <sup>2</sup>

<sup>1</sup> Kütahya Dumlupınar University, Engineering Faculty, Electrical and Electronic Engineering Department, Turkey

ORCID ID: 0000-0002-5390-4527, murat.tezcan@dpu.edu.tr

<sup>2</sup> Kütahya Dumlupınar University, Engineering Faculty, Electrical and Electronic Engineering Department, Turkey

ORCID ID: 0000-0002-5743-4681, ayca.akkaya0@ogr.dpu.edu.tr

\* Corresponding Author

### Abstract

In recent years, with the increasing demand for solar technology and photovoltaic panels, it is aimed to produce panels with different specifications for different installation and usage areas. However, with the increasing demand for devices with flexibility, light weight, compatibility and bendability, photovoltaic technology based on flexible solar cells has recently begun to be needed. In this article, the advantages of using “Tarpaulin type (foldable umbrella) panels”, which can be designed with flexible panels for use in different areas, will be examined for solar technology, which continues to develop today. With this rapidly advancing technology, Tarpaulin type panels, the design of which is targeted, can be used in many areas with ease of transportation. The biggest example of these areas is electric and hybrid vehicles. In portable tarpaulin type panels, it is aimed to be installed in the desired position without disturbing the design and model of the area to be used and to be able to generate electricity. In this study, the advantages and disadvantages of flexible solar panels compared to standard panels will be examined by considering. In addition, in this article, an examination of the necessary and appropriate materials to produce flexible solar panels will be made. Among the detailed materials ; plastics, metals and glass will be included.

**Keywords:** *Photovoltaic Technologies, Flexible Solar Panels, Electric Vehicles, Self Charging, Flexibility and portability.*



## EFFECTS OF VARIABLE WALL SURFACE ENERGY ON THE MOTION OF SELF-DRIVEN INTERFACE IN A CAPILLARY MICROCHANNEL

Mehmet Alptug Boylu <sup>1\*</sup>, Umut Ceyhan <sup>2</sup>

<sup>1</sup> Graduate School of Natural and Applied Sciences, İzmir Katip Çelebi University, Türkiye

ORCID ID: 0000-0003-1856-7606, alptugboylu.ab@gmail.com

<sup>2</sup> Department of Mechanical Engineering, İzmir Katip Çelebi University, Türkiye

ORCID ID: 0000-0003-0033-1013, umut.ceyhan@ikcu.edu.tr

\* Corresponding Author

### Abstract

The use of self-driven flows in microfluidic devices attracts attention as the requirement for the external driving mechanisms are either reduced or totally eliminated; this, in return, increases the mobility and applicability. Capillary microfluidics provides us with manipulation of the flow by the action of capillarity; namely, the pressure difference across interfaces may be used to drive the flow in micro-channels and can be controlled by chemical structure of the surfaces contact lines meet [1-4]. We, in this study, model capillary driven two-phase flows and investigate the motion of interfaces by varying the surface energy of the channel walls in a microfluidic setup. For the model problem, we use multiple relaxation time lattice Boltzmann Method to integrate the motion of interfaces [5]. This method has advantages against methods such as Finite Element Method, Finite Volume Method etc. in terms of computational cost, mobility and ease of implement etc. We first discuss classical static and dynamic interface problems for validation of our solver. Following the validations, we discuss two main problems: (i) alteration of the speed of the interface in a capillary, (ii) stopping the interface at a desired location. By designing the channel walls with varying wettability, we alter the contact line speed and show the deviations from the classical Washburn's law. Secondly, we show that the two contact lines meeting the top and bottom channel walls need to satisfy a simple condition to stagnate the motion. We also remark how the configuration of various regions with different energies affects the location of the stopped interface.

**Keywords:** Capillarity, Wetting, Interface, Microfluidics, Lattice Boltzmann Method

### References

- [1] Peicheng Teng, D. Tian, et al. [2020], "Recent progress of electrowetting for droplet manipulation: from wetting to superwetting systems", *Mater. Chem. Front.* 4, 140
- [2] A. Olanrewaju, M. Beaugrand, et al. [2018], "Capillary microfluidics in microchannels: from microfluidic networks to capillary circuits", *Lab Chip*, 18(16), 2323-2347
- [3] Xiangting Chang, Haibo Huang, et al. [2022], "Width effect on contact angle hysteresis in a patterned heterogeneous microchannel", *J. Fluid Mech.* 949(A15)
- [4] M.S. Mahmud, A. Alo, B. Farshchian et al. [2022], "Pulsed laser ablation on polymethylmethacrylate (pmma) surfaces for capillary driven flows", *Surfaces and Interfaces* 31, 101989
- [5] C.M Pooley, H. Kusumaatmaja and J. Yeomans [2008], "Contact line dynamics in binary lattice Boltzmann simulations", *Physical Review E.* 78, 056709



## MULTI-CLASS FEATURE SELECTION WITH METAHEURISTIC ALGORITHM THE CASE OF SIVRICE EARTHQUAKE

Mehlika Eraslan Celik <sup>1</sup>, Mihrimah Ozmen <sup>2\*</sup>

<sup>1</sup> *Erciyes University, Graduate School of Natural and Applied Sciences, Industrial Engineering Program, Kayseri, Türkiye*

ORCID ID: 0000-0003-3933-0149, eraslanmehlika97@gmail.com

<sup>2</sup> *Erciyes University, Department of Industrial Engineering, Kayseri, Türkiye*

ORCID ID: 0000-0002-2648-5865, mihrimah@erciyes.edu.tr

\* *Corresponding Author*

### Abstract

On January 24, 2020, an earthquake struck Sivrice, a district within the borders of Elazig Province in Türkiye's East Anatolian region. According to Türkiye's Emergency Management Presidency (AFAD, 2020), a major 6.8 magnitude (Mw) earthquake struck the East Anatolian Fault (EAF). The Earthquake Disaster and Emergency Management Presidency (AFAD) reported that 41 people were killed and 1,607 injured in the Sivrice earthquake.

Machine learning is a branch of artificial intelligence and computer science that mimics the way humans learn, giving systems and computers opportunities to learn and improve from past experiences. In machine learning, feature selection is one of the most frequently used and important techniques for pre-processing. Feature selection algorithms reduce the size of high-dimension datasets and analyze the data for relevant features or noisy, redundant, or irrelevant data. This process makes data mining algorithms faster, more predictive, and easier to understand. Feature selection is divided into two main categories: feature selection and feature creation or extraction. Feature extraction creates some new subsets from the original dataset, whereas feature selection selects a good subset from the original dataset without transformation. In machine learning, it is important to select subsets of relevant features. Since most classifications are binary, it is more difficult to select features with multiple classes.

Metaheuristics are approximate algorithms used to generate efficient solutions to complex optimization problems for which traditional optimization algorithms cannot provide an acceptable solution. They are presented in four main behavior-based categories, human-based, physics-based, evolutionary-based, and swarm intelligence-based. Metaheuristic algorithms are very efficient and effective at finding the best subset of a data set and are good at maintaining model accuracy. Because of this strength, this work focuses on the problem of feature selection using metaheuristic algorithms. Genetic Algorithm (GA) and Particle Swarm Optimization (PSO) are commonly used metaheuristic algorithms and were used in this study. PSO is a population-based optimization algorithm developed by observing the social behavior of animals/birds. GA is a metaheuristic inspired by Darwin's theory of evolution, belonging to the class of evolutionary algorithms.

The multi-class feature selection with metaheuristic algorithm was applied to the Sivrice Earthquake dataset and according to the algorithm selected feature subset is consist of 4 features: carrier system type of floor, the general intended use of the building, distance to the epicenter of the earthquake, number of floors in the building.

**Keywords:** *Metaheuristic algorithm, Earthquake, Feature Selection*

**Funding declaration:** This work was supported by research grants from The Scientific and Technological Research Council of Türkiye (Project No: 121E406) and Council of Higher Education 100/2000 PhD scholarship program.



## MULTI-OBJECTIVE EVOLUTIONARY ALGORITHM DAMAGE PREDICTION APPROACH FOR THE CASE OF SAMOS EARTHQUAKE

Mehlika Eraslan Celik <sup>1</sup>, Mihrimah Ozmen <sup>2\*</sup>

<sup>1</sup> Erciyes University, Graduate School of Natural and Applied Sciences, Industrial Engineering Program, Kayseri, Türkiye

ORCID ID: 0000-0003-3933-0149, eraslanmehlika97@gmail.com

<sup>2</sup> Erciyes University, Department of Industrial Engineering, Kayseri, Türkiye

ORCID ID: 0000-0002-2648-5865, mihrimah@erciyes.edu.tr

\* Corresponding Author

### Abstract

Earthquake-induced building collapses are one of the main causes of human casualties. Therefore, it is vital to quickly assess the buildings in an urban area affected by an earthquake and make the most accurate damage estimate. Damage estimation can help predict the aftermath of an earthquake to facilitate proper shelter for the injured and improve the post-earthquake response of rescue teams.

An earthquake with a magnitude of 7.0 MW occurred on October 30, 2020, off the island of Samos in the east of the Aegean Sea. Following the earthquake, tsunami waves affected coastal areas close to the epicenter, with greater intensity around the Bay of Sığacık (Türkiye) and northern Samos (Greece). In the earthquake that occurred on the Greek island of Karlovasi-Samos, 2 people lost their lives, 19 people were slightly injured, and many buildings were damaged or collapsed. However, the main impact of the earthquake was on the Türkiye city of Izmir, building collapses in the Izmir region killed more than 100 people and injured more than 1,000. The city center of Izmir, especially the Bayraklı district, suffered unexpected damage, with 12 buildings immediately collapsing and many others severely damaged.

Systematic and simultaneous optimization of more than one objective in the performance criterion is called multi-objective optimization. Pareto-based Elitist Multi-objective Evolutionary Algorithms to maximize accuracy and minimize classifier the complexity (number of rules) of classifiers, subject to interpretability constraints.

In this study, a post-earthquake structural damage prediction method was proposed with a multi-objective evolutionary algorithm and it is applied to Samos earthquake data. The algorithm generated 3 rules and achieved very satisfactory results with an accuracy of 94%.

**Keywords:** *Multi-Objective Optimization, Evolutionary Algorithm, Earthquake*

**Funding declaration:** This work was supported by research grants from The Scientific and Technological Research Council of Türkiye (Project No: 121E406) and the Council of Higher Education 100/2000 Ph.D. scholarship program.



## AIRCRAFT BRAKE INDUCED VIBRATIONS INVESTIGATION FOR GEAR-WALK AND BRAKE CHATTER PHENOMENA

Oner Altinbag <sup>1</sup>, Demet Balkan <sup>2</sup>

<sup>1</sup> Istanbul Technical University, Faculty of Aeronautics and Astronautics, Turkey

ORCID ID: 0000-0002-9310-2035, altinbago@itu.edu.tr

<sup>2</sup> Istanbul Technical University, Faculty of Aeronautics and Astronautics, Turkey

ORCID ID: 0000-0002-5807-2731, kececidem@itu.edu.tr

\* Corresponding Author

### Abstract

The aircraft landing gear system is one of the safest, most critical, and most complex systems of the aircraft. Aircraft manufacturers usually give their landing gear design activities to specialized companies. These companies can be a single one, or they can be different subcontractors for different subsystems. However, the responsibility for safety at the aircraft level is still under the responsibility of the aircraft manufacturer, and most of the design activities are done by the aircraft manufacturer. Although it is a mature design due to the principles of the landing gear, it still has a critical importance in aircraft design today due to its unique problems. Landing gear vibrations are still a subject of active research today. The main reason for this is that the results found are not shared because most of the studies conducted in the industry provide commercial advantages. The landing gear is a complex structure by nature, so the engineering solutions are design dependent and unique for each aircraft design. Undesirable vibrations on the aircraft can occur both in the air and on the ground. The best example in the air is the engine imbalance event. Landing gear-induced vibrations can be considered the harshest and most destructive for on-ground operations. The study aims to make an investigation on brake-induced vibration phenomena. The dummy aircraft model with tri-cycle landing gear was created by using MSC ADAMS software. There are some conceptual aircraft assumptions for the aircraft design in this study. The main purpose of the assumptions are the representing the generic fighter jet or middle-weight civil aircraft ground dynamics behavior. Since the total aircraft design is a multi-disciplinary and significantly specialized process, the author made some generic assumptions for the physical arrangement of the aircraft and its landing gear. The structural dynamics of the landing gear highly depended on the structural design of the aircraft and it is assumed a rigid body in this study. However, the landing gear itself consists of bushing-like joints with free plays which are assumed to be representative of landing gear stiffness. As a result of the studies, the effects of brake-induced vibrations were investigated and compared with previous studies. Four different analysis model environments were created and the results were compared with each other. Brake vibrations at high speeds (+75 m/s) usually cause vibrations of low amplitude and high frequency. Vibrations called "gear walk" at low speeds (-25 m/s) caused vibrations of high amplitude and low frequency. For this reason, it has been observed that the "gear walk" phenomenon has a more critical effect when considering the ground handling, structural dynamics and structural life.

**Keywords:** Aircraft, Landing gear, Braking, Vibration, Structural dynamics





## COMPARISON OF TWO MAGNETIC STORMS OCCURRED IN SAME SOLAR ACTIVITY PERIOD

**Samed Inyurt**

*Tokat Gaziosmanpaşa University, Department of Geomatics Engineering, Tokat, Türkiye*

*ORCID ID: 0000-0001-9339-7569, samed.inyurt@gop.edu.tr*

### **Abstract**

The ionosphere is constantly changing due to differences in solar, geomagnetic, and seismic activity. GPS observations offer an effective tool to monitor these changes. Total electron content (TEC) is a helpful statistic to characterize the ionosphere and study ionospheric fluctuation using GPS devices. This investigation aims to pinpoint TEC changes caused by magnetic storms (Kp 8) that passed over ISTA station in 2015 and 2017. GNSS-TEC was calculated for the 20 days preceding to the magnetic storm as well as the day of it. Then, to detect ionospheric disruption during a storm, 27 quiet days were constructed. TEC value averages were created utilizing statistical techniques to identify upper and lower bounds. On June 22, 2015, a magnetic storm (Kp = 8.3) was investigated. A negative disturbance (about 6 TECU) was observed during the magnetic storm. On September 8, 2017, another magnetic storm with a Kp of 8.3 was discussed. It was determined that there was a positive disturbance of about 4 TECU.

**Keywords:** *Ionosphere, Geomagnetic storm, GPS*



## TRENDS IN INEQUALITIES IN CHILDHOOD STUNTING IN ETHIOPIA FROM 2000 TO 2016: A CROSS SECTIONAL STUDY

Betregiorgis Zegeye<sup>1</sup>, Gebretsadik Shibre<sup>2</sup>,  
Dina Idriss-Wheeler<sup>3</sup>, Sanni Yaya<sup>4\*</sup>

<sup>1</sup> HaSET Maternal and Child Health Research Program, Shewarobit Field Office, Addis Ababa, Ethiopia

ORCID ID: 0000-0003-4550-3261, betregiorgiszegeye27@gmail.com

<sup>2</sup> Department of Reproductive, Family and Population Health, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

ORCID ID: 0000-0001-6671-9833, gebretsh@gmail.com

<sup>3</sup> Interdisciplinary School of Health Sciences, University of Ottawa, Ottawa, Canada

didri040@uottawa.ca

<sup>4</sup> School of International Development and Global Studies, University of Ottawa, Ottawa, Canada

<sup>4</sup> The George Institute for Global Health, The University of Oxford, Oxford, UK

ORCID ID: 0000-0002-4876-6043, sanni.yaya@uOttawa.ca

\* Corresponding Author

### Abstract

The decrease in the magnitude of stunting over the past 20 years has been slow in Ethiopia. To date, in Ethiopia, the trends in and extent of inequality in stunting have not been investigated using methods suitably developed for disparity studies. This paper investigated both the extent and overtime dynamics of stunting inequality in Ethiopia over the last 17 years.

Using the World Health Organization's Health Equity Assessment Toolkit software, data from the Ethiopia Demographic and Health surveys (EDHS) were analyzed between 2000 and 2016. The inequality analysis consisted of disaggregated rates of stunting using five equity stratifiers (economic status, education, residence, region and sex) and four summary measures (Difference, Population Attributable risk, Ratio and Absolute Concentration Index). A 95% uncertainty interval was constructed around point estimates to measure statistical significance.

The study showed that both absolute and relative inequalities in stunting exist in all the studied years in Ethiopia. The inequality disfavors children of mothers who are poor, uneducated and living in rural areas and specific regions such as Amhara. The pro-rich ( $R = 1.2$ ; 1.1, 1.3 in 2000 to  $R = 1.7$ ; 1.4, 2 in 2016) and pro-educated ( $R = 1.6$ ; 95%UI = 1.3, 1.9 in 2000 and  $R = 2.3$ ; 95%UI = 1.5, 3 in 2011) inequalities slightly increased with time. Male children bear a disproportionately higher burden of stunting, and the disparity increased between the first and the last time points ( $PAR = -1.5$  95%UI =  $-2.5$ ,  $-0.6$  in 2000 and  $PAR = -2.9$  95%UI =  $-3.9$ ,  $-1.9$ ) based on complex measures but remained constant with simple measures ( $R = 1$ ; 95%UI = 0.9, 1.1 in 2000 and  $R = 1.1$  95%UI = 1, 1.2 in 2016). Similarly, both the sub-national regional and residence-related stunting disparities generally widened over time according to some of the inequality measures.

Stunting appeared to be highly prevalent among certain sub-groups (i.e. poor, uneducated and living in rural regions). The subpopulations experiencing excessively high stunting prevalence should be the focus of policy makers' attention as they work to achieve the WHO 40% reduction in stunting target by 2025 and the UN Agenda 2030 for Sustainable Development Goals.

**Keywords:** DHS, Ethiopia, Global health, Inequality, Stunting



## PRESCRIPTIVE ANALYTICS AND ADVANCED WORKFORCE MANAGEMENT FOR OPTIMIZED O&M OF SOLAR POWER PLANTS “PANAMA”

Ugur Cem Yilmaz <sup>1\*</sup>, Rabia Seyma Gunes <sup>2</sup>,  
Canan Sisman Korkmaz <sup>3</sup>, Alper Terciyanlı <sup>4</sup>

<sup>1</sup> Inavitas Energy, R&D Department, Turkey

ORCID ID: 0000-0002-6913-1493, cem.yilmaz@inavitas.com

<sup>2</sup> Inavitas Energy, R&D Department, Turkey

ORCID ID: 0000-0002-6320-775X, seyma.yilmaz@inavitas.com

<sup>3</sup> Endoks Energy, R&D Department, Turkey

ORCID ID: 0000-0001-6394-2319, canan.korkmaz@endoks.com

<sup>4</sup> Endoks Energy, R&D Department, Turkey

ORCID ID:0000-0003-2671-2615, alper.terciyanli@endoks.com

**\* Corresponding Author**

### Abstract

Failures in the functioning of a solar power plant cause unexpected breakdowns, a loss of output, and lost income, much like in many other sectors. Reactive maintenance makes about 55% of all maintenance tasks since unexpected problems occur so frequently. Predictive maintenance presently accounts for 12% of routine and scheduled work, while "preventive maintenance," which accounts for 31%. All these maintenance schemes are based on three data analytics techniques which are descriptive (what happened), diagnostic (why it happened) and predictive (what will happen). All of these, meanwhile, only offer a small amount of help. In order to get toward a maintenance strategy that answers the question: What should be done? it is in the best interest of asset owners and managers to continue along this path. The recommended course of action to obtain a certain outcome is provided by prescriptive analytics based on previous results. As a result, "prescriptive maintenance" enters the picture, where it assists in enhancing the capability to provide guidance to the technician on what to do and how to fix by making use of artificial intelligence and machine learning. In this case, an O&M suite for solar power plants utilizing predictive analytics, sophisticated performance monitoring, and mobile workforce management tools must be built, verified, and demonstrated in an operational setting.

In this international project, 4 partners came together and began to work in 2020. Each partner has been contributing to the project since then by developing a prescriptive maintenance tool (University of Western Macedonia), developing failure detection and degradation algorithms (Austrian Institute of Technology), developing workforce management system and platform interfaces (Inavitas Energy) and lastly providing data with ensuring pilot fields (Insos Energy).

With the increasing use of emerging technologies in energy industry heading towards digitalization goal, number of innovative solutions dramatically went up. This project proposes a solution consisting of prescriptive analytics where it is one more step beyond the predictive analytics and also its application on the O&M of solar power plants with a mobile work force management tool which will be adopted to specific requirements of the solar O&M works. For this purpose, fault detection and degradation algorithms that will detect and classify system performance failures and performance loss trends, even at early stages and in some cases before occurrence.



For fault detection process following inputs are used: MPP voltage/current, optional module temperature, AC and DC power, measured irradiation and ambient temperature. Then, for maintenance tool: locations, number of inverters, solar irradiance, number of strings per inverter and number of panels per string information has used to time forecasting.

Until today, majority of the duties in the scope of project has been completed. As for time being, work plans and work force management system integration is going on process. After completion of this last step, it is expected to be done.

**Keywords:** *Optimization, Prospective maintenance, Solar energy, Workforce management*



## HYALURONIC ACID/BSA NANO-BIO COMPOSITE SYSTEMS AS POTENTIAL GREEN CARRIERS FOR SUPEROXIDE DISMUTASE/CATALASE COVALENT IMMOBILIZATION AS NOVEL BIOCATALYSTS: INCREASED REUSABILITY AND STABILITY

Atheer Atiroglu <sup>1</sup>, Ali Sultan Al- Hajri <sup>2</sup>, Ahmed Atiroglu <sup>3</sup>, Vesen Atiroglu <sup>4\*</sup>

<sup>1</sup> Sakarya University, Biomedical, Magnetic and Semiconductor Materials Application and Research Center (BIMAS-RC), 54187, Sakarya, Turkey

ORCID ID: 0000-0003-2409-7030, amehde@sakarya.edu.tr

<sup>2</sup> SASSRP Tıbbi Teknolojik ARGE Ticaret ve Sanayi Limited Şirketi

ORCID ID: 0000-0002-6188-9486, alialhajri4444@hotmail.com

<sup>3</sup> Sakarya University, Faculty of Medicine, 54290, Sakarya, Turkey

ORCID ID: 0000-0002-4196-2885, ahmed.atiroglu@ogr.sakarya.edu.tr

<sup>4</sup> Sakarya University, Biomedical, Magnetic and Semiconductor Materials Application and Research Center (BIMAS-RC), 54187, Sakarya, Turkey

ORCID ID: 0000-0001-7551-133X, wesenm@sakarya.edu.tr

\* Corresponding Author

### Abstract

Superoxide dismutase (SOD) and catalase (CAT), two antioxidant enzymes found in the body that constantly coexist, provide the most efficient mechanism for controlling free radical levels. SOD converts superoxide anions to hydrogen peroxide, while CAT eliminates hydrogen peroxide from tissues, limiting the creation of more damaging free radicals. Individual SOD or CAT encapsulation or immobilization was employed in a variety of applications, including medication administration and biosensors. Furthermore, there have been few research on SOD/CAT multi enzyme immobilization. The goal of this work is to increase CAT and SOD activity after encapsulation by co-immobilizing the enzymes as a pair. Through the use of new green carriers as an efficient and effective support, the successful immobilization of superoxide dismutase/catalase SOD/CAT is demonstrated in this study for the first time. Various techniques, including Fourier transform infrared spectroscopy, thermal gravimetric measurement, and scanning electron microscopy were used to examine the chemical composition, morphology, and functional groups of the immobilized SOD/CAT. The enzymatic activities of the immobilized SOD/CAT @ Hyaluronic acid /BSA (SOD/CAT @ Hyaluronic acid /BSA) were compared with the free one. In comparison to the free enzyme, the pH and thermal stability of the SOD/CAT@ Hyaluronic acid/BSA were dramatically improved. High long-term storage stability was shown by the SOD/CAT @ Hyaluronic acid /BSA, which could preserve more than 92% of the original activity for 8 weeks. Additionally, the SOD/CAT @ Hyaluronic acid /BSA demonstrated great reusability and after 20 cycles, still exhibited a high level of activity (more than 80%). In this work, SOD/CAT@ Hyaluronic acid/BSA nanocomposite is used for the first time as an immobilizing support for the SOD/CAT multi enzyme. Immobilized SOD/CAT multi enzyme may be useful for use in medical, industrial, and biotechnological applications because to its improved catalytic efficiency ( $V_{max}/K_m$ ) values, reusability, and storage stability.

**Keywords:** Hyaluronic acid; BSA; bio composite; superoxide dismutase; catalase

