

**IV. ULUSLARARASI
BİLİM VE İNOVASYON KONGRESİ
(INSI 2023)
ÖZET METİN BİLDİRİ KİTABI**



**IV. INTERNATIONAL
SCIENCE AND INNOVATION CONGRESS
(INSI 2023)
ABSTRACT PROCEEDINGS BOOK**

AĞUSTOS / AUGUST 2023

Kitabın Adı: IV. Uluslararası Bilim ve İnovasyon Kongresi
Özet Metin Bildiri Kitabı

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IV. International Science and Innovation Congress, 27-30 July 2023, TURKEY

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KONGRE PROGRAMI / CONGRESS SCHEDULE

ORAL PRESENTATION				
28 July 2023 - Friday				
Session 1				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
13:30 - 13:40	SYNTHESIS AND ANTIDIABETIC ACTIVITY OF HYDRAZONE DERIVATIVES	Rabia Kilic, Bediye Seda Kursun Aktar, Emine Elcin Oruc-Emre	Rabia Kilic	Rabia Kilic
13:40 - 13:50	SYNTHESIS OF NEW A-AMINO NITRILE COMPOUNDS AND STUDY OF ANTI-ALZHEIMER'S ACTIVITY BY MOLECULAR MODELING	Adil Ozbay, Emine Elcin Oruc-Emre, Aysegul Karakucuk-Iyidogan	Adil Ozbay	Adil Ozbay
13:50 - 14:00	NOVEL CHIRAL THIOUREAS DERIVED FROM BENZYL ISOTHIOCYANATE: DESIGN, SYNTHESIS, CHARACTERIZATION AND EVALUATION OF ACHE AND BCHE INHIBITION ACTIVITIES	Zafer Bulut, Aysegul Iyidogan, Yusuf Sicak, Emine Elcin Emre	Zafer Bulut	Zafer Bulut
14:00 - 14:10	SYNTHESIS OF HYDRAZONE DERIVATIVES AND INVESTIGATION OF THEIR ANTIOXIDANT AND ANTICHOLINESTERASE ACTIVITY PROPERTIES	Cengiz Karakurt, Bediye Seda Kursun Aktar, Aysegul Karakucuk-Iyidogan, Yusuf Sicak, Emine Elcin Oruc-Emre	Cengiz Karakurt	Cengiz Karakurt
14:10 - 14:20	INVESTIGATION OF BIOACTIVE PEPTIDES IN CALVATIA GIGANTEA (GIANT MUSHROOM) PROTEIN HYDROLYSATES	Ali Zeytunluoglu	Ali Zeytunluoglu	Ali Zeytunluoglu
Session 2				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
15:00 - 15:10	RESPONSE OF SOIL ORGANIC CARBON MINERALIZATION TO LEAVES OF CERATONIA SILIQUA L. AND PINUS BRUTIA TEN. UNDER LABORATORY CONDITION	Sahin Cenkseven, Burak Kocak	Sahin Cenkseven	Burak Kocak
15:10 - 15:20	AN EFFICIENT LOGARITHMIC NUMERICAL METHOD FOR THE GENERALIZED BURGERS-HUXLEY EQUATION	Bilge Inan	Bilge Inan	Bilge Inan
15:20 - 15:30	CYCLIC CODES OVER THE RING FPX(FP+VFP)	Fatma Caliskan, Tulay Yildirim, Refia Aksoy	Fatma Caliskan	Refia Aksoy
15:30 - 15:40	THE EFFECT OF SUPPORTING SCIENCE EDUCATION CONCEPT TEACHING IN SCHOOLS WITH OUTSIDE CLASS ACTIVITIES ON THE ACADEMIC SUCCESS OF STUDENTS AND STUDENT OPINIONS ON THE PROCESS	Begum Busra Aksoy, Hasan Inac	Begum Busra Aksoy	Begum Busra Aksoy
15:40 - 15:50	MODELING OF NUMBER OF TRAFFIC ACCIDENT IN ANKARA WITH REGRESSION AND DECISION TREE METHODS	Mustafa Baran Sevimli, Mine Fulya Gursel, Lina Kiran, Esra Sahin, Hatice Tul Kubra Akdur	Hatice Tul Kubra Akdur	Mustafa Baran Sevimli
Session 3				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
16:30 - 16:40	COMPUTED TOMOGRAPHY-ASSISTED TRANSTHORACIC NEEDLE ASPIRATION BIOPSY BY PULMONOLOGIST IN A CHEST DISEASES HOSPITAL: 4 YEAR EXPERIENCE	Gul Erdal Donmez, Selahattin Oztas, Dilek Emam	Gul Erdal Donmez	Gul Erdal Donmez
16:40 - 16:50	EVALUATION OF KNOWLEDGE, ATTITUDES AND BEHAVIORS OF HEALTH SCIENCES FACULTY STUDENTS ABOUT INFECTIOUS DISEASES: ÇANAKKALE CASE	Hilal Nur Sakalli, Sadi Turgut Bilgi	Hilal Nur Sakalli	Hilal Nur Sakalli
16:50 - 17:00	DO INSTITUTIONAL DIFFERENCES AFFECT HEALTHCARE PROFESSIONALS ATTITUDES TOWARDS QUALITY STUDIES?	Seyhan Cerci, Nermin Uyurdag, Ebru Sevinc, Nuran Reyhanoglu	Seyhan Cerci	Seyhan Cerci



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17:00 - 17:10	A COMPILATION STUDY ON THE BURNOUT OF HEALTHCARE PROFESSIONALS	Altug Cagatay, Figen Ozsahin	Altug Cagatay	Altug Cagatay
17:10 - 17:20	ROLE OF MAGNETIC RESONANCE IMAGING IN THE PROGNOSIS OF INTERVERTEBRAL DISC DISEASES	Ebru Eravci Yalin, Zeynep Nilufer Akcasiz, Simge Ugur	Zeynep Nilufer Akcasiz	Zeynep Nilufer Akcasiz
17:20 - 17:30	ELECTROCHEMOTHERAPY IN VETERINARY MEDICINE	Simge Ugur	Simge Ugur	Simge Ugur
29 July 2023 - Saturday				
Session 4				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
09:00 - 09:10	CULTURAL COMPETENCE IN NURSING CARE	Burcu Caki Doner	Burcu Caki Doner	Burcu Caki Doner
09:10 - 09:20	CHANGES IN BODY TEMPERATURE IN THE NEWBORN: NURSING APPROACHES IN HYPOTHERMIA	Burcu Korkmaz, Durdu Fatma Ugur, Atiye Karakul, Duygu Sonmez Duzkaya	Burcu Korkmaz	Burcu Korkmaz
09:20 - 09:30	ASSISTED BREATHING PRACTICES IN NEWBORNS	Durdu Fatma Ugur, Burcu Korkmaz, Atiye Karakul, Duygu Sonmez Duzkaya	Durdu Fatma Ugur	Durdu Fatma Ugur
09:30 - 09:40	EVALUATION OF AIRFLOW CHANGES ASSOCIATED WITH MAXILLARY SINUS PATHOLOGIES BEFORE AND AFTER THE TWO-STAGE SINUS AUGMENTATION OPERATION USING THE COMPUTATIONAL FLUID DYNAMICS METHOD	Ipek Necla Guldiken, Alperen Tekin, Fatih Suda, Zeynep Gulen Cukurova Yilmaz	Alperen Tekin	Alperen Tekin
09:40 - 09:50	PRE-ERUPTIVE INTRAKORONAL RADIOLUCENCY: A RETROSPECTIVE CASE REPORT	Irem Mergen Gultekin	Irem Mergen Gultekin	Irem Mergen Gultekin
Session 5				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
10:30 - 10:40	FAMILIAL MEDITERRANEAN FEVER WITH TRIPLE MEV MUTATION: COMPARISON OF TRIPLE, COMPOUND DOUBLE, AND FREQUENT SINGLE MUTATIONS IN A TURKISH PEDIATRIC COHORT	Aysegul Alpcan, Yasar Kandur, Derya Beyza Sayin Kocakap, Serkan Tursun, Didem Aliefendioglu	Aysegul Alpcan	Aysegul Alpcan
10:40 - 10:50	EVALUATION OF PREALBUMIN AS A BIOMARKER	Elif Karabacak	Elif Karabacak	Elif Karabacak
10:50 - 11:00	SURFACE-BASED MORPHOMETRIC CHANGES IN PATIENTS WITH HYPERTHYROIDISM	Baris Genc	Baris Genc	Baris Genc
11:00 - 11:10	VITAMIN D LEVELS IN PREGNANCY, GESTATIONAL DIABETES AND REPRODUCTIVE AGE WOMEN	Mehmet Kulhan	Mehmet Kulhan	Mehmet Kulhan
11:10 - 11:20	ANALYSIS OF PRENATAL INVASIVE PROCEDURES IN A TERTIARY CENTER: A TWO-YEAR EXPERIENCE	Gokcen Orgul	Gokcen Orgul	Gokcen Orgul
Session 6				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
12:00 - 12:10	THE EFFECTS OF DIFFERENT DIET MODELS IN VITRO FERTILIZATION OUTCOMES	Mehmet Kulhan	Mehmet Kulhan	Mehmet Kulhan
12:10 - 12:20	THE EFFECT OF FETAL GENDER ON TRANSVERSE CEREBELLAR DIAMETER MEASUREMENTS	Gokcen Orgul	Gokcen Orgul	Gokcen Orgul
12:20 - 12:30	ENDOVASCULAR MANAGEMENT OF SPONTANEOUS LUMBAR ARTERY HEMORRHAGE	Muhammet Kursat Simsek, Ozgur Ozen	Muhammet Kursat Simsek	Muhammet Kursat Simsek
12:30 - 12:40	BILATERAL FACIAL NERVE PARALYSIS: CASE REPORT AND CLINICAL APPROACH	Tarik Yagci	Tarik Yagci	Tarik Yagci



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12:40 - 12:50	PARTIAL SPLENIC EMBOLIZATION FOR HYPERSPLENISM AFTER LIVER TRANSPLANTATION	Ozgur Ozen, Tolga Zeydanli	Tolga Zeydanli	Tolga Zeydanli
Session 7				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
13:30 - 13:40	RESOLUTION IN READING ANALOG DATA: A LABVIEW APPLICATION	Sabri Bicakci	Sabri Bicakci	Sabri Bicakci
13:40 - 13:50	INTERNET OF THINGS SUPPORTED FROST CONTROL IN AGRICULTURE	Huseyin Safa Unlu	Huseyin Safa Unlu	Huseyin Safa Unlu
13:50 - 14:00	DETECTION OF DEFECTS IN MOLDED SHEETS USING THE MFL METHOD: AN ANISOTROPIC MAGNETO-RESISTIVE SENSOR APPLICATION	Hakan Citak	Hakan Citak	Hakan Citak
14:00 - 14:10	CONTROL OF PURE INTEGRATING PROCESSES WITH TIME DELAY USING WHALE OPTIMIZATION ALGORITHM	Tufan Dogruer	Tufan Dogruer	Tufan Dogruer
14:10 - 14:20	DEVELOPMENT OF LABVIEW-BASED QUALITY CONTROL SYSTEM FOR DETECTION OF DIMENSIONAL DEFECTS IN AUTOMOTIVE INDUSTRY PRODUCTION LINES	Elif Aydan Bike, Gokay Bayrak	Elif Aydan Bike	Elif Aydan Bike
14:20 - 14:30	EFFECT OF GLASS FIBER STRUCTURE ON HEADLINER ACOUSTIC PERFORMANCE	Naci Uysal, E. Egemen Yildirim	Naci Uysal	Naci Uysal
Session 8				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
15:00 - 15:10	MICROSCALE ANALYSIS OF HYDROGEN STORAGE IN METAL HYDRIDE REACTORS	Ruveyda N. Kaplan, Gamze Atalmis, Bora Timurkutluk, Serkan Toros, Yuksel Kaplan	Gamze Atalmis	Gamze Atalmis
15:10 - 15:20	A NOVEL RECTANGULAR NOZZLE DESIGN AND MOTION CONTROL TO INCREASE THE SPEED OF YOGURT FILLING MACHINES	Yasin Kaya, Huseyin Ergin, Gokhan Gelen	Yasin Kaya	Yasin Kaya
15:20 - 15:30	EFFECT OF GEOMETRY AND LOCATION OF CRACK ON MODAL ANALYSIS OF BEAMS	Mustafa Kurt, Bilcen Mutlu Mitil	Mustafa Kurt	Bilcen Mutlu Mitil
15:30 - 15:40	NUMERICALLY INVESTIGATION OF THE EFFECTS OF THE CHEVRON ANGLE ON THE THERMAL PERFORMANCE OF A PLATE HEAT EXCHANGER	Haydar Yagmur, Halil Bayram	Halil Bayram	Haydar Yagmur
15:40 - 15:50	OPTIMIZATION OF PROCESS PARAMETERS FOR TENSILE STRENGTH OF 3D PRINTED CARBON FIBER BASED POLYAMIDE SAMPLES	Ersin Kaya, Selim Hartomacioglu, Beril Eker Gumus	Ersin Kaya	Ersin Kaya
15:50 - 16:00	DEVELOPMENT AND OPTIMIZATION OF CARBOXYMETHYL CELLULOSE-REINFORCED BINDER FOR DIRECT INK WRITING METHOD	Necati Ercan, Onur Saray	Necati Ercan	Necati Ercan
Session 9				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
16:30 - 16:40	NUMERICAL INVESTIGATION OF REACTION KINETICS OF ADDED AND COATED HYDROGEN STORAGE MATERIALS	Gamze Atalmis, Serkan Toros, Yuksel Kaplan	Gamze Atalmis	Gamze Atalmis
16:40 - 16:50	ANALYSIS OF DIFFERENT FIXATION METHODS IN CRANIAL IMPLANTS BY FINITE ELEMENT METHOD	Murat Giziroglu	Murat Giziroglu	Murat Giziroglu
16:50 - 17:00	NUMERICAL STUDY OF A BLOWING VEHICLE'S CENTRIFUGAL FAN FLOW STRUCTURES	H. Atakan Baytas, Gokhan Koca	H. Atakan Baytas	H. Atakan Baytas
17:00 - 17:10	THE EFFECTS OF HEAT TREATMENT PARAMETERS ON CUTTING TOOL PROPERTIES	Emin Ali Epcim, Mahmut Ercan Acma	Emin Ali Epcim	Emin Ali Epcim



IV. Uluslararası Bilim ve İnovasyon Kongresi, 27-30 Temmuz 2023, TÜRKİYE
IV. International Science and Innovation Congress, 27-30 July 2023, TURKEY

17:10 - 17:20	PMN-PT BASED PIEZOELECTRIC THICK FILM PRODUCTION WITH SCREEN PRINTING TECHNIQUE AND EFFECT OF PASTE FORMULATION ON FINAL PROPERTIES	Ezgi Kilicgedik, Yusuf Ozturk, Afife Binnaz Hazar Yoruc	Ezgi Kilicgedik	Ezgi Kilicgedik
17:20 - 17:30	COMPARISON BETWEEN SIMULATION RESULTS OF DIE ELEMENTS OBTAINED BY TRIAL-AND-ERROR AND DIE ELEMENTS MANUFACTURED BY REVERSE ENGINEERING	Ismail Gurbuz, M. Hakan Ozkan, Abdulmecit Guldass	Ismail Gurbuz	Ismail Gurbuz
30 July 2023 - Sunday				
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Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
09:00 - 09:10	MACHINE LEARNING IN DIABETES CLASSIFICATION: DATA ANALYSIS WITH EXTRA TREES CLASSIFIER	Yeliz Durgun	Yeliz Durgun	Yeliz Durgun
09:10 - 09:20	BIOMINERALIZATION CAPACITY DETERMINATION OF MUTANT BACILLUS MEGATERIUM	Nur Beril Us, Hamdi Ogut	Nur Beril Us	Nur Beril Us
09:20 - 09:30	DESIGN OF SOLVENT BASED ROTOGRAVURE WHITE INK FOR PET-G MATERIAL IN HYBRID PRINTING MACHINE THAT CAN BE COMPATIBLE WITH OFFSET INKS	Bora Ocak, Bahman Mansurzade, Emine Topaloglu, Sebnem Yildiz, Halide Sesli, Canan Uraz	Canan Uraz	Bora Ocak
09:30 - 09:40	HYDROTHERMAL CARBONIZATION OF RICE HUSK: FUEL PROPERTIES AND CO ₂ ADSORPTION	Zeynep Yildiz Uzun	Zeynep Yildiz Uzun	Zeynep Yildiz Uzun
09:40 - 09:50	A SIMPLE SYNTHESIS OF CR ₂ O ₃ NANOPARTICLES AND ITS PHYSICAL, ELECTROCHEMICAL CHARACTERIZATIONS	Gamze Bozkurt Yildirim	Gamze Bozkurt Yildirim	Gamze Bozkurt Yildirim
09:50 - 10:00	PROS AND CONS OF NON-THERMAL TECHNIQUES IN FOOD PROCESSING AND PRESERVATION	Recep Gunes, Ozgur Karadas Konuk	Recep Gunes	Ozgur Karadas Konuk
Session 11				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
10:30 - 10:40	SYSTEM-LEVEL DESIGN SPACE EXPLORATION BY USING SYMBOLIC CONTROL	Mete Ozbaltan	Mete Ozbaltan	Mete Ozbaltan
10:40 - 10:50	NEXT-GENERATION HANDWRITING RECOGNITION SYSTEM IMPLEMENTED WITH MICROCONTROLLER EMBEDDED DEVICE	Mahmut Durgun	Mahmut Durgun	Mahmut Durgun
10:50 - 11:00	DEEP LEARNING APPROACHES FOR AUTOMATIC BREAST CANCER DETECTION: PERFORMANCE EVALUATION ON MAMMOGRAPHIC IMAGES	Seda Bayat, Gultekin Isik	Seda Bayat	Seda Bayat
11:00 - 11:10	MOBILE ROBOT NAVIGATION WITH DEEP REINFORCEMENT LEARNING	Huseyin Pullu, Cihan Karakuzu	Huseyin Pullu	Huseyin Pullu
11:10 - 11:20	BLOCKCHAIN BASED VEHICLE REGISTRATION SYSTEM	Fatih Ornek, Zafer Guler, Yunus Emre Isik, Halil Arslan	Zafer Guler	Zafer Guler
Session 12				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
12:00 - 12:10	CUSTOMIZABLE HARDWARE COMMUNICATION PROTOCOL FOR INDUSTRIAL AUTOMATIONS	Omer Faruk Kelek, Zafer Guler, Yasin Gormez, Halil Arslan	Zafer Guler	Zafer Guler
12:10 - 12:20	AN ENSEMBLE LEARNING MODEL FOR EARLY DETECTION OF DEMENTIA FROM MRI IMAGES	Veysel Turk, Halil Arslan, Hatice Catal Reis	Halil Arslan	Halil Arslan
12:20 - 12:30	INSTRUMENT CHORD CLASSIFICATION WITH MACHINE LEARNING ALGORITHMS	Aslihan Guven, Fatih Aydin	Aslihan Guven	Aslihan Guven



IV. Uluslararası Bilim ve İnovasyon Kongresi, 27-30 Temmuz 2023, TÜRKİYE
IV. International Science and Innovation Congress, 27-30 July 2023, TURKEY

12:30 - 12:40	DISEASE PREDICTION FROM NATURAL LANGUAGE SYMPTOM DESCRIPTIONS IN TURKISH	A. Huseyin Ezirmik, Fatih Aydin	A. Huseyin Ezirmik	A. Huseyin Ezirmik
Session 13				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
13:30 - 13:40	INVESTIGATION OF TREATED WASTE WATER USAGE OPPORTUNITIES OF KONYA SELÇUKLU AND KARATAY DISTRICT FARMERS	Murat Ekici, Ilknur Kutlar Yaylali	Murat Ekici	Murat Ekici
13:40 - 13:50	KINETIC MODELING OF CHLORELLA VULGARIS MICROALGAE'S BEHAVIOR IN WATER TREATMENT	Burcu Simsek Uygun, Esin Huriye Bugdayci	Esin Huriye Bugdayci	Esin Huriye Bugdayci
13:50 - 14:00	DETECTION OF EARTHQUAKE DAMAGES WITH SATELLITE IMAGERY AND DEEP LEARNING APPROACHES	Fatma Elik	Fatma Elik	Fatma Elik
14:00 - 14:10	IMPACT OF PARAMETER VARIATIONS ON REACHABILITY SETS OF AERODYNAMIC INTERCEPTORS	Tugba Bayoglu, Gokcan Akalin	Tugba Bayoglu	Tugba Bayoglu
14:10 - 14:20	EVALUATION OF ENGINEERING APPLICATIONS IN URBAN AND RURAL STRUCTURES; VAN PROVINCE EXAMPLE	Cafer Giyik	Cafer Giyik	Cafer Giyik
14:20 - 14:30	SITE SELECTION APPLICATIONS IN DISASTER HOUSING IN THE PERSPECTIVE OF DISASTER AND ARCHITECTURAL DESIGN; VAN CITY EXAMPLE	Cafer Giyik	Cafer Giyik	Cafer Giyik
Session 14				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Lect. Umut Saray Meeting Hall Vice-Chairman: Assist. Prof. Dr. Tolga Yucehan		
Time	Title of Study	Authors	Corresponding Author	Presenter
15:00 - 15:10	THERMOCHROMIC DYE APPLICATION STUDY IN HOSIERY AND INVESTIGATION OF IT'S FASTNESS PROPERTIES	Sevda Koksall Daban	Sevda Koksall Daban	Sevda Koksall Daban
15:10 - 15:20	MECHANICAL CHARACTERIZATION OF THERMAL AND UV CURED GLASS COMPOSITES HAVING DIFFERENT LAY-UP CONFIGURATIONS	Oguz Eryilmaz	Oguz Eryilmaz	Oguz Eryilmaz
15:20 - 15:30	THE INVESTIGATION OF PROPERTIES AND APPLICATIONS OF ANIMAL LEATHER USED IN THE READY-MADE CLOTHING AND APPAREL INDUSTRY	Mustafa Sabri Ozen, Nalan Kutlu Satircioglu, Mine Dursun, Nergis Demirel Gultekin	Mustafa Sabri Ozen	Mustafa Sabri Ozen
Session 15				
Hall Name: INSI - Meeting Hall		Meeting Hall Chairman : Assist. Prof. Dr. Tolga Yucehan Meeting Hall Vice-Chairman: Lect. Umut Saray		
Time	Title of Study	Authors	Corresponding Author	Presenter
16:30 - 16:40	MICRO-SCALE STUDY OF THE EFFICIENCY OF HEAT EXCHANGERS WITH NANOFLUIDS	Fateh Mebarek-Oudina	Fateh Mebarek-Oudina	Fateh Mebarek-Oudina
16:40 - 16:50	PREVALENCE AND ANTIMICROBIAL RESISTANCE OF KLEBSIELLA PNEUMONIA RECOVERED FROM RETAILED MEAT IN WASIT MARKETS, IRAQ	Manal Hadi Ghaffoori Kanaan, Sura Saad Abdullah	Manal Hadi Ghaffoori Kanaan	Manal Hadi Ghaffoori Kanaan
16:50 - 17:00	IRON ORE DEPOSIT IN THE VAREŠ AREA WITH OCCURRENCES OF COMPLEX SULPHIDES OF LEAD, ZINC, AND BARITE (BOSNIA AND HERZEGOVINA)	Mevlida Operta, Sylejman Hyseni, Enes Muzaqi	Enes Muzaqi	Mevlida Operta
17:00 - 17:10	STATIC AND DYNAMIC MODE INVESTIGATION OF DISPLACEMENT AND STRESSES IN PINE FLAT DAM	Hamidreza Abbaszadeh, Reza Trinejad	Reza Trinejad	Hamidreza Abbaszadeh
17:10 - 17:20	ANTIDIABETIC PLANTS USED IN SAIVA TEMPLE RITUALS IN SRI LANKA	Saravanan Vivekanandarajah, Vinujan Shanmugalingam, Pholtan Rajamanoharan	Saravanan Vivekanandarajah	Saravanan Vivekanandarajah
17:20 - 17:30	SUPPORT VECTOR MACHINE MODEL IN PREDICTING THE ENERGY DISSIPATION IN LABYRINTH WEIRS	Hamidreza Abbaszadeh, Yousef Hassanzadeh	Hamidreza Abbaszadeh	Hamidreza Abbaszadeh



DAVETLİ KONUŞMACILAR / INVITED SPEAKERS

MICRO-SCALE STUDY OF THE EFFICIENCY OF HEAT EXCHANGERS WITH NANOFLUIDS

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Abstract

The effects of multiple input parameters on a micro open tall enclosure filled with various nanofluids and sinusoidally heated from the bottom sidewall utilizing an experiments design are carried out. The importance of the nanofluids to improve the energy and thermal system is improved by many researchers [1-6].

The obtained results suggest that the local heat transfer on the bottom sidewall is strongly influence d by Rayleigh and Hartmann numbers, while the entropy generation dependents on Knudsen number. Also the optimization of the magnitude and sinusoidal temperature wavelength can improve both heat transfer and entropy generation. The design of experiments (DOE) is one of the most important strategies for improving the quality and performance of energy and thermal systems. These results provide valuable insights into the design of micro heat exchangers and suggest that the optimization of micro-porous geometries using DOE for high energy efficiency. [7-10]

Keywords: *Micro heat exchanger; Nanofluids; Experiments Design; Optimization.*

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PREVALENCE AND ANTIMICROBIAL RESISTANCE OF *KLEBSIELLA PNEUMONIA* RECOVERED FROM RETAILED MEAT IN WASIT MARKETS, IRAQ

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Abstract

Klebsiella pneumonia (*K. pneumonia*) is a major source of community-acquired and nosocomial infections, as well as a significant food-borne pathogen that can cause septicaemia, liver abscesses, and diarrhea in people. Several investigations have shown that meat products sold in grocery stores include various bacteria, including *K. pneumoniae*, lending credence to the hypothesis that contaminated meat is a major source of human exposure to *Klebsiella*. Little is known regarding the incidence of highly resistant *K. pneumoniae* in meat products slated for sale in Wasit markets due to a lack of relevant data about the prevalence of *K. pneumoniae* in the region's markets, so, this study was carried out in Wasit province to investigate the bacteria's presence in retailed meat samples.

Samples of chicken (n=40) and beef (n=31) were taken at random from several native markets in order to compare their quality and safety. Bacteria were isolated and identified using conventional microscopy, bacteriological, and biochemical techniques. Electronic RapID™ ONE (4 hours) biochemical panel micro-tubes strep identification system compendium with reference colors chart and online confirmation microcode data base software was then used for further identification. The sensitivity of microorganisms to various antimicrobials was determined using a disk diffusion test, with 14 different antimicrobials being assessed.

Positive tests for *K. pneumonia* were found in 15 (48.5%) and 9 (22.5%) of 71 samples of beef and chicken, respectively. All *K. pneumoniae* isolates tested positive for resistance to at least six antibiotics; these isolates represented 12 different Antibiotypes. Resistance to the chosen antibiotics was extremely high across the board (74.2%-100%) across all isolates tested. Eighty-five percent of the isolates were classified as having an MRI score between (0.84 and 1).

Multidrug-resistant *K. pneumoniae* was detected at an alarmingly high frequency in retail meat sold in Wasit markets, posing a serious threat to human health. So, it's important to get the word out that food in particular retailed meat might be a reservoir for this harmful infection.

Keywords: Antibigram, cattle meat, chicken meat, *Klebsiella pneumonia*, Wasit Markets

IRON ORE DEPOSIT IN THE VAREŠ AREA WITH OCCURRENCES OF COMPLEX SULPHIDES OF LEAD, ZINC, AND BARITE (BOSNIA AND HERZEGOVINA)

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Abstract

The area of Vareš is known for the production of metallic mineral raw materials: iron ore, chromium, manganese, lead, and zinc with barite. The population of Vareš has been engaged in the mining and processing of ore, trade, and manufacturing of iron objects since ancient times. Even during the time of Bosnian rulers, lead was mined in this area, which is related to German miners (Saxons). In the localities of Borovica, Orti, and Veovača there are traces of old lead, gold, and silver mining. This area is also promising in the domain of non-metallic mineral raw materials, among which the most thoroughly researched spilites, amphibolites, and limestones are suitable as raw materials for the production of technical-building materials, architectural-decorative stone, and stone wool.

The paper analyses the metallogenic and mineralgenic characteristics of the area of Vareš and provides a historical overview of the research of mineral raw materials so far. During 1991, production was suspended in the lead, zinc, and barite mine of Veovača near Vareš, and the following year, exploitation was suspended in the iron ore mine of Vareš (the Smreka and Brezik surface mines, and in the Droškovac pit).

During the exploitation of lead, zinc and barite and the processing of concentrates at the Veovač open pit, a decision was made to carry out sampling of the mineralized zone at the Smreka open pit in order to gain insight into the quality of the ore zone with non-ferrous metals and the possibilities of processing. The paper presents the results of laboratory tests and geological research, as well as the attached geological profiles of the part of the deposit from which sampling and laboratory tests were carried out.

Keywords: mine, ore zones, lead, zinc, barite, iron, chromium, manganese, geological mapping, laboratory testing, reserves, quality.

STATIC AND DYNAMIC MODE INVESTIGATION OF DISPLACEMENT AND STRESSES IN PINE FLAT DAM

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Abstract

Here, static and dynamic analysis based on the frequencies mode of the Pine Flat dam has been investigated using ABAQUS software. For this purpose, a mesh with quadrilateral elements was used in the upper two partitions from the arch part to the crest, and the lower partition from the arch part of the dam to the bottom of the dam. Various mesh networks were investigated to find the optimal mesh. In addition, in the study of the frequency of the dam mode, the first 20 natural modes of the dam were investigated. The results showed that the amount of tensile stress at the lowest point of the dam is equal to 0.53 MPa, which according to the tensile stress range of concrete between 2 to 3 MPa, the amount of stress applied to the dam is less than this range, which leads to its stability. This value is different from each other in different meshes. The maximum amount of displacement in the dam crest is 0.0114 m. The results showed that the maximum pressure in the middle of the dam bottom is 2.168 MPa. In addition, its lowest value at the crest of the dam is 0.04 MPa. The effective mass of the first mode in the x direction is 4641.57 tons, that is, 33% of the total mass.

Keywords: Static analysis, Dynamic analysis, Pine Flat dam.

ANTIDIABETIC PLANTS USED IN SAIVA TEMPLE RITUALS IN SRI LANKA

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Abstract

Saivism is one of the six branches of Hinduism currently followed in Sri Lanka. In 2021, 537 million people (20 to 79 years old) had diabetes. Further, Siddha Medicine is one of the four traditional medicines practiced in Sri Lanka. Siddha Medicine principles are based on Saiva philosophies. Therefore, this work aims to identify and document the antidiabetic plant species currently used in Saiva temple rituals in Sri Lanka and assess the highest levels of reported antidiabetic scientific evidence for recorded plant species. Sri Lankan Saivism school textbooks and temple rituals books were used to identify the plant species, and relevant reported antidiabetic activities were obtained employing the Web of Science, ScienceDirect, and PubMed databases until May 2023. In total, 140 plant species from 58 families were identified, and 82 plant species had antidiabetic scientific evidence. Moreover, the *Fabaceae* have the most documented plant species. Most of the plants identified in the present research were used for medicinal purposes. Overall, 89 antidiabetic compounds were isolated. In addition, most plant species have *in vivo*, followed by clinical and *in vitro*, antidiabetic evidence. This study revealed and recorded the Sri Lankan Saiva temple ritual plant species and laid the basis for future antidiabetic activity research utilizing these plant species.

Keywords: Diabetes, Fabaceae, Plants, Saivism, Siddha Medicine, Sri Lanka.

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SÖZLÜ SUNUMLAR / ORAL PRESENTATION

SÖZLÜ SUNUMLAR ORAL PRESENTATION

SYNTHESIS OF NEW α -AMINO NITRILE COMPOUNDS AND STUDY OF ANTI-ALZHEIMER'S ACTIVITY BY MOLECULAR MODELING

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Abstract

An α -aminonitrile is a compound containing both an amino and a nitrile functional group. In addition to the preparation of α -aminonitrile compounds from cheap and easily accessible starting materials, their properties such as being valuable intermediates in the chemical synthesis of pharmacologically and biologically active molecules (such as α -amino acids) have brought these compounds to a very important place in organic and biochemical sciences. The Strecker reaction for the synthesis of α -aminonitriles is one of the conventional ways. The Strecker method, which is an effective and easy method, was used for the synthesis of α -aminonitriles by stirring aldehydes, amines, and trimethylsilylcyanide with the addition of a catalytic amount of L-proline at room temperature. Alzheimer's disease is the most common neurodegenerative disease that begins with a decline in cognitive functions and is seen in the elderly population worldwide. Although drugs are currently available for the treatment of Alzheimer's disease, there is still no definitive cure. The targeted aminonitrile compounds were synthesized with various aldehydes by 4-(4-fluorophenoxy) aniline in acetonitrile. The structures of α -aminonitriles obtained as racemic mixtures were elucidated by spectroscopic methods (such as FTIR, ¹H and ¹³C NMR) and elemental analysis. To understand the role of the obtained amino nitriles in the treatment of this disease, a molecular modeling study was carried out with the Auto Dock Vina program.

Keywords: α -Aminonitrile, Alzheimer's disease, Strecker reaction.

EVALUATION OF AIRFLOW CHANGES ASSOCIATED WITH MAXILLARY SINUS PATHOLOGIES BEFORE AND AFTER THE TWO-STAGE SINUS AUGMENTATION OPERATION USING THE COMPUTATIONAL FLUID DYNAMICS METHOD

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Abstract

The surgical procedure of maxillary sinus floor augmentation aims to re-level the pneumatized sinus floor prior to implant surgery. Today, this technique is implemented in various concepts, executed as either a single or two-stage process, depending on the height of the residual alveolar bone level. In the two-stage method, a surgical window is opened in the lateral wall of the sinus, and following the removal of the bone window, the Schneider membrane covering the sinus floor is repositioned upwards. Subsequently, materials such as autografts, allografts, xenografts, alloplastic materials, and growth factors are used to elevate the sinus floor. Complications that can occur during or after the procedure may present themselves as different problems in the postoperative period. These may include sinus membrane perforation, infection, oroantral fistula, and sinusitis. The primary goal of our study is to predict and prevent potential complications following sinus floor augmentation surgery using the principles of Computational Fluid Dynamics (CFD). CFD is a branch of fluid mechanics that uses numerical analysis and data structures to analyze and solve problems involving fluid flows. In this method, computers are used to perform the necessary calculations to simulate the flow of fluids and gases and their interaction with surfaces. In this study carried out using the CFD method, the quantity of graft material to be positioned in 3D within the sinus cavity, its effects on postoperative sinus air flow dynamics, and changes in ostium openness were examined. It remains a question as to what impact the 'graftless sinus floor augmentation', a procedure accepted by various authorities, creates in terms of sinus air pressure and fluid dynamics, and to what extent it is connected with postoperative complications. Analyses based on the models obtained using the CFD method have resolved these ambiguities in this causality-based deadlock and enabled the correct interpretation of the reasons behind the results. In this way, the dentist can perform treatment with a more comfortable surgery, and the patient will be protected from possible complications. In this study evaluations reveal that while the flow rate in the surgery region has significantly decreased, the total speed has actually increased. This could potentially enhance the risk of damage to the sinus walls and mucosa. Essentially, it can be postulated that an increase in the lifting amount might trigger anomalies in sinus functions and cause substantial alterations in air-created pressure and velocity. The altered form of the sinus following a lift might be one of the factors contributing to the failure of sinus operations. Consequently, instead of a deep and vertical lifting model, a homogeneous lifting process progressing along a consistent trajectory may mitigate the anomalies resulting from sudden acceleration and deceleration in the airflow. This adjustment could further enhance the success rate of the procedure. CFD modeling of maxillary sinus lifting operation is a novel technique for to examine possible complications of grafting areas of maxillary sinus. It may prove useful in determining the optimal lifting measure before the surgery for each patient.

Keywords: *Computational Fluid Dynamics, Implant Surgery, Maxillary Sinus Floor Elevation.*

AN EFFICIENT LOGARITHMIC NUMERICAL METHOD FOR THE GENERALIZED BURGERS-HUXLEY EQUATION

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Abstract

In this work, we propose Crank-Nicolson logarithmic finite difference scheme to solve for the generalized Burgers-Huxley equation. The solutions of Huxley generalized Huxley, and Burgers-Huxley equations derived from the generalized Burgers-Huxley equation are also we examined under the name of the generalized Burger-Huxley equation. Also, the solution of the generalized Burger-Huxley equation is investigated. The generalized Huxley and Burgers-Huxley equation which is studied in this work is one of the important non-linear partial differential equations. Nonlinear partial differential equations are often encountered when modeling problems in various fields such as science, medicine, and engineering. Since the equations that we solve in this paper are non-linear the scheme leads to a system of non-linear equations. Newton's method is used to solve this non-linear system at each time-step. In order to examine the ability of the method to solve equations, some examples are considered. These examples are created by choosing different parameters in the equations. Obtained numerical solutions of the examples by the Crank-Nicolson logarithmic finite difference method compared with the exact solutions and other defined results in the literature. From these comparisons concluded that the Crank-Nicolson logarithmic finite difference method is a reliable and convenient alternative for solving non-linear Burgers' type equations.

Keywords: *The generalized Burgers-Huxley equation, Finite difference method, Logarithmic finite difference method, Crank-Nicolson logarithmic finite difference method.*

EVALUATION OF ENGINEERING APPLICATIONS IN URBAN AND RURAL STRUCTURES; VAN PROVINCE EXAMPLE

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Abstract

The city of Van, one of the 30 metropolitan cities in Turkey; population, geopolitical position, BC It is an important city in terms of its history dating back to 5000 years and its natural assets. Despite its deep-rooted history and urbanism experience, problems such as unplanned urbanization habits, wrong zoning practices and unqualified building stock still remain in Van, as in many other cities in Turkey. With the effect of unplanned urbanization, the nature-human relationship has deteriorated, and the character of the building stock, texture and silhouette of the city have deteriorated with the negative effect of migration, rapid population growth and illegal construction.

The aim of this study; By analyzing the existing building stock of Van, to identify the deficiencies and misapplications in the construction, to draw attention to the necessity of transforming unlicensed buildings that have not received engineering service into safe and robust structures, and to renew the built environment in the city. In the study, the engineering applications of the building stock of the city of Van are discussed. In this context, the literature was searched and the structures determined by sampling method in the city center and rural areas were examined in the field.

In the study, it was observed that the majority of the buildings in the city center were reinforced concrete, while in the countryside it was approximately 95% masonry, the harmony of the city and the natural environment was disturbed, the chaotic and unplanned agglomeration increased in the built environment, and the urban life quality parameters were low.

The rate of licensed buildings in Van Center is 9.55%. Badly designed structures that have not received engineering service constitute the dominant texture of the city. The green areas of the city are destroyed for construction. In this context, suggestions were made to increase the quality of the built environment in Van, to reduce the problems caused by zoning and to prevent environmental degradation.

Keywords: *City of Van, Architectural Features, Engineering Applications Planning, Design, Building Stock*

KENTSEL VE KIRSAL ALANDAKİ YAPILARDA MÜHENDİSLİK UYGULAMALARI ÜZERİNE BİR DEĞERLENDİRME; VAN İLİ ÖRNEĞİ

Özet

Türkiye'deki 30 büyükşehirden biri olan Van kenti; nüfusu, jeopolitik konumu, M.Ö. 5000 yılına uzanan tarihi ve sahip olduğu doğal varlıklar bakımından önemli bir kenttir. Köklü geçmişi ve şehircilik deneyimine rağmen Türkiye'nin birçok kentinde olduğu gibi Van'da da plansız kentleşme alışkanlıkları, yanlış imar uygulamaları ve niteliksiz yapı stoku gibi sorunlar güncelliğini korumaktadır. Plansız kentleşmenin etkisiyle doğa-insan ilişkisi bozulmuş, göç, hızlı nüfus artışı ve kaçak yapılaşmanın negatif etkisiyle yapı stokunun karakteri, kentin dokusu ve silüeti bozulmuştur.

Bu çalışmanın amacı; Van'ın mevcut yapı stokunun analizini yaparak, yapılaşmadaki eksiklikler ve yanlış uygulamaları tespit etmek, mühendislik hizmeti almamış ruhsatsız yapıların güvenli, sağlam yapılara dönüştürülmesi ve kentteki yapı çevrenin yenilenmesinin gerekliliğine dikkat çekmektir. Çalışmada Van kentinin yapı stokunun mühendislik uygulamaları ele alınmıştır. Bu kapsamda literatür taraması yapılarak kentin merkez ve kırsalında örnekleme yöntemiyle belirlenen yapılar sahada incelenmiştir.

Çalışmada, kent merkezindeki yapıların büyük çoğunluğunun betonarme, kırsalda ise yaklaşık %95 oranında yığma olduğu, kent ve doğal çevre uyumunun bozulduğu, yapı çevre kaotik, plansız yığılmanın arttığı, kentsel yaşam kalite parametrelerinin ise düşük olduğu görülmüştür.

Van Merkezde ruhsatlı yapı oranı %9,55'tir. Mühendislik hizmeti almamış kötü tasarım ürünü yapılar kentin hâkim dokusunu oluşturmaktadır. Kentin yeşil alanları yapılaşma için tahrip edilmektedir. Bu bağlamda Van'da yapı çevrenin kalitesinin artırılması, imar kaynaklı sorunların azaltılması ve çevresel bozulmaların önlenmesi için çözüm önerilerinde bulunulmuştur.

Anahtar Kelimeler: *Van Kenti, Mimari Özellikler, Mühendislik Uygulamaları Planlama, Tasarım, Yapı Stoku*

SITE SELECTION APPLICATIONS IN DISASTER HOUSING IN THE PERSPECTIVE OF DISASTER AND ARCHITECTURAL DESIGN; VAN CITY EXAMPLE

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Abstract

The Depending on the geological structure of the land, its geographical location and meteorological conditions, Van Province is exposed to disasters such as earthquakes, landslides, floods, floods, rockfalls, avalanches and rising water levels of Lake Van. Although Van carries different disaster risks in terms of disaster, the most earthquake damage occurs in the city due to the tectonic structures that produce earthquakes in the region. The main reason why structures are damaged in disasters is the selection of places in areas with disaster risk and the construction of structures that are not resistant to disasters without disaster risk analysis. In the disasters experienced between 2000 and 2020 in Van, 144.230 buildings were damaged in different degrees and loss of life occurred. In this process, a total of 29,788 houses were built with different financing models and construction methods to meet the shelter needs of the disaster victims and return their lives to normal. Experienced disasters show that disaster damages cannot be prevented without a solid and suitable structure on the right ground. Different factors such as disaster, geological, geomorphological structure, socio-economic structures of the victims and legal regulations are effective in site selection. The parcel sizes of the place to be selected should be suitable for the regional conditions, geographical structure, family and household sizes, social, cultural habits, and business sectors of the disaster victims. Since the workplace-housing relationship of the disaster survivors who have been relocated within the scope of internal resettlement is a problem after the disaster, this issue should be considered in site selection. In the study, the disaster management of Van Province and the location selection practices of disaster houses built in Van by disaster management units within the scope of post-disaster recovery activities were examined.

Keywords: *City of Van, Disaster, Earthquake, Site selection, Disaster Housing, AFAD*

AFETSELLİK VE MİMARİ TASARIM PERSPEKTİFİNDE, AFET KONUTLARINDA YER SEÇİMİ UYGULAMALARI; VAN KENTİ ÖRNEĞİ

Özet

Van İli, arazinin jeolojik yapısı, coğrafik konumu ve meteorolojik koşullara bağlı olarak deprem, heyelan, sel, su baskını, kaya düşmesi, çığ ve Van Gölü su seviyesinin yükselmesi gibi afetlere maruz kalmaktadır. Van afetsellik açısından farklı afet risklerini taşısa da bölgedeki deprem üreten tektonik yapılardan dolayı kentte en fazla deprem hasarı söz konusu olmaktadır. Afetlerde yapıların hasar görmesinin temel nedeni afet risk analizleri yapılmadan, afet riski taşıyan alanlarda yer seçilmesi ve yapıların afete dayanıksız yapılmasıdır. Van'da 2000-2020 yılları arasında yaşanan afetlerde 144.230 yapıda farklı derecede hasar oluşmuş, can kayıpları meydana gelmiştir. Bu süreçte afetzedelerin barınma ihtiyaçlarının karşılanarak hayatlarının normale dönmesi için farklı finansman modeli ve yapım yöntemleriyle toplam 29.788 konut yapılmıştır. Yaşanan afetler, afet zararlarının doğru zemine sağlam ve uygun yapı yapılmadan önlenemeyeceğini göstermektedir. Yer seçimlerinde, afetsellik, jeolojik, jeomorfolojik yapı, afetzedelerin sosyo-ekonomik yapıları, yasal düzenlemeler gibi farklı faktörler etkilidir. Seçilecek yerin parsel büyüklükleri bölgesel koşullara, coğrafi yapıya, aile ve hane halkı büyüklüklerine, afetzedelerin sosyal, kültürel alışkanlık ve iş sektörlerine uygun olmalıdır. Afetzedelerden iç iskân kapsamında yeri değiştirilenlerin işyeri- konut ilişkisi afet sonrasında sorun olduğundan yer seçiminde bu hususa dikkat edilmelidir. Çalışmada Van İlinin afetselliği ile afet sonrası iyileştirme faaliyetleri kapsamında afet yönetimi birimleri tarafından Van'da yapılan afet konutlarının yer seçimi uygulamaları incelenmiştir.

Anahtar Kelimeler: *Van Kenti, Afetsellik, Deprem, Yer seçimi, Afet Konutu, AFAD*

SYNTHESIS OF HYDRAZONE DERIVATIVES AND INVESTIGATION OF THEIR ANTIOXIDANT AND ANTICHOLINESTERASE ACTIVITY PROPERTIES

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Abstract

Alzheimer's disease (AD) is a type of dementia that causes memory, thought, and behavior problems. One of the causes of Alzheimer's disease is the cholinergic effect hypothesis. According to this hypothesis, it is the inhibition of cholinesterase, known as the cholinergic effect, because it selectively pathologically degenerates neurons. Acetylcholinesterase acts on acetylcholine and hydrolyzes it to acetic acid and choline. Thus, reduce in acetylcholine concentration injuries neurons in the brain. Therefore, there is an urgent need for the discovery of new drugs due to the limited use of existing acetylcholinesterase inhibitors. The hydrazone derivatives with many pharmacological activities are one of the important compounds for acetylcholinesterase inhibitors. In order to find new potential inhibitors, in this study, a new series of hydrazones were synthesized using the starting material of benzo[b]thiophene-2-carboxaldehyde, and their antioxidant and anticholinesterase activities were investigated. Also *in silico* studies were carried out to calculate the potential of the synthesized compounds to be drug candidates.

Keywords: Alzheimer's disease, Acetylcholinesterase, Hydrazone, Antioxidant, *In silico*.

THE EFFECTS OF HEAT TREATMENT PARAMETERS ON CUTTING TOOL PROPERTIES

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Abstract

All over the world, the processing industry is very important for both defense and electronics, machinery and automotive technologies. Tool steels are also indispensable for the metalworking industry. The effect of the temperature of the austenitizing heat treatment applied during the hardening process of the high speed tool steels, which are basically divided into 4 main groups, on the hardness, tempered hardness, residual austenite and forces on the tool during cutting, which are determinative for the function of the tool steels, were investigated. By means of these concepts, the optimum austenitization temperature for the life of the tool was investigated. In this study, Böhler brand S705 steel, which is very important for the machining industry, was used. DIN code 1.3243 and AISI code M35, this steel contains high amounts of carbon as well as alloying elements such as chromium, tungsten, molybdenum, vanadium and cobalt. Austenitization temperatures of 5 °C were selected as 5 different temperatures. Then, the tools tempered with 3-step tempering were subjected to various tests. In order to see the effect of austenitizing temperature without tempering, the hardnesses were measured before and after tempering, and microstructure photographs were taken. The number of grains was calculated from the photographs taken. Then, with the tempered samples, the forces on the tool were measured instantaneously during processing with the MicroTap test device and integrated software. The residual austenite amount was determined by applying XRD to the tempered samples. In order to better compare all these results, they were graphed and the results were examined.

Keywords: Heat treatment, High speed tool steel, Tapping, Cutting force.

ISIL İŞLEM PARAMETRELERİNİN KESİCİ TAKIM ÖZELLİKLERİNE ETKİLERİ

Özet

Tüm dünyada işleme endüstrisi gerek savunma gerek elektronik, makine ve otomotiv teknolojileri için oldukça önemlidir. Takım çelikleri de metal işleme endüstrisi için vazgeçilmezdir. Temel olarak 4 ana gruba ayrılan takım çeliklerinden biri olan yüksek hız takım çeliklerinin sertleştirme işlemi esnasında uygulanan östenite alma ısıl işleminin sıcaklığının, takım çeliklerinin işlevi için belirleyici olan sertlik, menevişli sertlik, kalıntı östenit ve kesme esnasında takım üzerinde oluşan kuvvetlere etkisi incelenmiştir. İncelenen bu kavramlar aracılığıyla takımın ömrü için optimum olan östenitleme sıcaklığı araştırılmıştır. Bu çalışmada işleme endüstri için oldukça önemli olan Böhler marka S705 çelik kullanılmıştır. DIN kodu 1.3243 ve AISI kodu M35 olan bu çelik yüksek miktarda karbonun yanında, krom, tungsten, molibden, vanadyum ve kobalt gibi alaşım elementleri içermektedir. Östenitleme sıcaklıkları arasında 5 °C olan 5 farklı sıcaklık olarak seçilmiştir. Daha sonra 3 adımlı menevişleme ile menevişi verilen takımlar çeşitli testlere tabi tutulmuştur. Menevişleme olmadan, sadece östenitleme sıcaklığının etkisini görebilmek için menevişleme öncesi ve sonrası sertlikler ölçülmüş ayrıca mikroyapı fotoğrafları alınmıştır. Alınan fotoğraflar ile tane sayısı hesaplanmıştır. Daha sonra menevişlenen numuneler ile MicroTap test cihazı ve entegre yazılım ile işleme esnasında anlık olarak takıma binen kuvvetler ölçülmüştür. Menevişlenmiş numunelere ayrıca XRD uygulanarak kalıntı östenit miktarı tespit edilmiştir. Tüm bu sonuçları daha iyi karşılaştırmak adına grafiklere dökülüp, sonuçlar incelenmiştir.

Anahtar Kelimeler: Isıl işlem, Yüksek hız takım çeliği, Kılavuz, Kesme kuvvetleri.

OPTIMIZATION OF PROCESS PARAMETERS FOR TENSILE STRENGTH OF 3D PRINTED CARBON FIBER BASED POLYAMIDE SAMPLES

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Abstract

Manufacturing parts in 3D printers with the Fuse deposition modelling (FDM) is one of today's innovative manufacturing methods. The advantages of the method can be listed as the possibility to produce very complex designs, easy customization, low fixed cost, speed and ease of prototyping, faster and less risky product development, and finally less waste. The quality of the printed parts is affected by many process parameters. We can list some of these parameters as follows; post-treatment heat treatment, nozzle temperature, layer thickness, part printing direction, printing speed, fill pattern and density. In this study, the effects of different levels of nozzle temperature, printing speed and heat treatment time on tensile strength are investigated. Taguchi L9 orthogonal array method was used in the experimental design and the test samples were printed according to ASTM D638 -14 type 1 (Tensile) standard. These experiments were produced in two sets in a way to make a total of 18 test samples. According to the results obtained, the nozzle temperature has a critical effect on the tensile strength. The increase in printing speed affects tensile strength negatively. It caused a decrease in tensile strength especially after 55 mm/s. The heat treatment process has a positive effect on the tensile strength. However, keeping the processing time over 20 minutes has no significant benefit in terms of tensile strength. In this state, filaments such as Carbon FiberBased Polyamide can be used as material for complex parts in the machinery field, medium load parts in the automotive field and aerospace field.

Keywords: Carbon fiber reinforced PA (CF-PA), Fuse Deposition Modeling(FDM), Additive Manufacturing(AM), Taguchi Method, Tensile strength

3D BASKI KARBON FİBERLİ ESASLI POLYAMİD NUMUNELERİNİN ÇEKME DAYANIMI İÇİN PROSES PARAMETRELERİNİN OPTİMİZASYONU

Özet

Günümüzün yenilikçi imalat yöntemlerinden biri de Eriyik Yığılma Yöntemiyle (FDM) 3D yazıcılarda parça imalatıdır. Yöntemin avantajları çok karmaşık tasarımları üretme imkanının olması, kolay kişiselleştirme, düşük sabit maliyet, prototipleme hızı ve kolaylığı, daha hızlı ve daha az riskli ürün geliştirme ve son olarak daha az atık üretme olarak sıralayabiliriz. Basılan parçaların kalitesi birçok işlem parametresinden etkilenmektedir. Bu parametrelerden bazılarını şu şekilde sıralayabiliriz; işlem sonrası ısıtma işlemi, nozul sıcaklığı, katman kalınlığı, parça baskı yönü, yazdırma hızı, dolgu deseni ve yoğunluğudur. Bu çalışmada, değişik seviyelerdeki nozul sıcaklığı, yazdırma hızı ve ısıtma süresinin çekme mekanik dayanımı üzerindeki etkileri incelenmektedir. Deney tasarımında Taguchi L9 ortogonal array yöntemi kullanılmıştır ve deney numuneleri ASTM D638 -14 type 1 (Tensile) standartına göre baskı yapılmıştır. Bu deneyler iki set halinde toplamda 18 adet deney numunesi yapılacak şekilde üretilmiştir. Elde edilen sonuçları göre sonuçlara göre, Nozul sıcaklığının çekme mukavemeti üzerinde kritik etkisi vardır. Yazdırma hızının artışı çekme mukavemeti olumsuz yönde etkilemektedir. Özellikler 55 mm/s'den sonra çekme mukavemetinin azalmasına sebep olmuştur. Isıtma işlemi süreci çekme mukavemeti üzerinde pozitif yönde etki etmektedir. Fakat işlem süresinin 20 dk'nin üzerinde tutulmamasının çekme mukavemeti açısından önemli bir faydası yoktur. Bu haliyle Karbon Fiberli Esaslı Polyamid gibi filamentler makine alanında karmaşık parçalar, otomotiv alanı ve havacılık alanında orta yüklerde parçalar için malzeme olarak kullanılabilir.

Anahtar Kelimeler: Karbon Fiber Takviyeli PA (CF-PA), Eriyik Biriktirmeli Modelleme, Eklemeli İmalat (AM), Taguchi Metodu, Çekme mukavemeti

PMN-PT BASED PIEZOELECTRIC THICK FILM PRODUCTION WITH SCREEN PRINTING TECHNIQUE AND EFFECT OF PASTE FORMULATION ON FINAL PROPERTIES

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Abstract

Screen printing is the most widely used thick-film deposition technique for producing structures with thicknesses from a few micrometers to several tens of micrometers, as it is relatively simple and convenient. While it is possible to produce a variety of functional thick film materials with this technique, piezoelectric thick films with different compositions are among the most popular ones. The interest in piezoelectric thick films is due to the fact that the devices reduce the driving voltage and prevent significant degradation of electrical properties compared to thin films. This advantage it provides; It offers significant advantages in various applications such as micro-actuators, microelectromechanical systems (MEMS), high-frequency transducers, pyroelectric infrared sensors and surface acoustic wave devices. In addition to the most widely used PZT-based piezoelectric materials today, there has been an increase in the use of relaxor ceramics, especially in recent years. Although $(1-x)\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$ (PMN-PT) is the most studied system from the relaxor ferroelectric material family, thick film structures have not been studied in detail. In this study, it is aimed to examine the effect of paste composition on piezoelectric properties by creating 65PMN-PT thick film structure with screen printing technique. In our previous studies, the effect of Fe_2O_3 additive on 65PMN-PT matrix was studied and the composition formed by adding 0.2% Fe_2O_3 by weight was chosen because it increased the piezoelectric charge coefficient (d_{33}), dielectric constant, electromechanical coupling coefficient and microhardness properties. For this reason, a paste suitable for screen printing technique was prepared by using PMN-PT based piezoelectric powder with 0.2% Fe_2O_3 additive. 2%, 4% and 6% by weight frit additive was added to the prepared paste in order to increase its adhesion to the substrate during sintering. Creating a homogeneous paste at this stage is very important for the repeatability and surface quality of the coating. In addition, the appropriate viscosity of the paste is also an important production parameter so that the paste can pass through the sieve during the coating process. Alumina was chosen as the substrate material. Curing was carried out by applying a silver bottom electrode on the alumina substrate. Then, coatings with a thickness of 50 μm were carried out with 65PMN-PT based pastes prepared using the screen printing method and sintered at 850 °C. After the top electrode application and curing process were completed using silver, the polarization process was carried out. After the measurements, it was determined that there was a decrease in the piezoelectric charge coefficient and capacitance values with the increase of the frit ratio in the paste composition. In addition, it was determined that the addition of frit into the composition improves the adhesion strength of the thick film structure.

Keywords: Piezoelectric thick film, PMN-PT, Screen printing, Piezoelectric paste.

SERİGRAFİ TEKNİĞİ İLE PMN-PT ESASLI PİEZOELEKTRİK KALIN FİLM ÜRETİMİ VE MACUN FORMÜLASYONUNUN NİHAİ ÖZELLİKLERE ETKİSİ

Özet

Serigrafi, birkaç mikrometreden birkaç on mikrometreye kadar kalınlığa sahip yapılar üretmek için, nispeten basit ve kullanışlı olması nedeniyle en yaygın kullanılan kalın film biriktirme tekniğidir. Bu teknik, çeşitli fonksiyonel kalın film malzemelerinin üretimi mümkün olabilmekle birlikte, en popüler olanlar arasında, farklı bileşimlere sahip piezoelektrik kalın filmler gelmektedir. Piezoelektrik kalın filmlere olan ilgi, cihazların sürüş voltajını düşürmesinden ve ince filmlere kıyasla elektriksel özelliklerin belirgin şekilde bozulmasını önlemesinden kaynaklanır. Sağladığı bu avantaj; mikro-aktüatörler, mikroelektromekanik sistemler (MEMS), yüksek frekanslı dönüştürücüler, piezoelektrik kızılötesi sensörler ve yüzey akustik dalga cihazları gibi çeşitli uygulamalarda önemli avantajlar sunmaktadır. Piezoelektrik malzemeler matris yapısına bağlı olarak farklı özellikler sergilemektedir. Günümüzde en yaygın olarak kullanılan PZT esaslı piezoelektrik malzemelerin yanı sıra, özellikle son yıllarda relaksör seramiklerin kullanımlarında artışlar yaşanmaktadır. $(1-x)\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$ (PMN-PT), relaksör ferroelektrik malzeme ailesinden en çok çalışılan sistem olmasına rağmen, kalın film yapıları ayrıntılı olarak incelenmemiştir. Bu çalışmada, serigrafi tekniğiyle 65PMN-PT kalın film yapısı

oluşturularak macun kompozisyonunun piezoelektrik özelliklerine etkisinin incelenmesi hedeflenmiştir. Önceki çalışmalarımızda, Fe_2O_3 katkısının 65PMN-PT matrisine etkisi çalışılmış ve piezoelektrik yük katsayısı (d_{33}), dielektrik sabiti, elektromekanik bağlaşma katsayısı ve mikrosertlik özelliklerinde artış sağlaması nedeniyle ağırlıkça %0,2 Fe_2O_3 katkısıyla oluşturulan kompozisyon seçilmiştir. Bu nedenle %0,2 Fe_2O_3 katkılı PMN-PT esaslı piezoelektrik tozu kullanılarak serigraf tekniğine uygun macun hazırlanmıştır. Hazırlanan macuna, sinterleme sırasında altlığa tutunmasını arttırmak amacıyla ağırlıkça %2, %4 ve %6 oranında frit katkısı yapılmıştır. Bu aşamada homojen bir macun oluşturulması, kaplamanın tekrarlanabilirliği ve yüzey kalitesi açısından oldukça önemlidir. Bununla birlikte kaplama işlemi sırasında macunun elekten geçebilmesi için macunun uygun viskozite değerinde olması da önem taşıyan bir üretim parametresidir. Altlık malzeme olarak alümina seçilmiştir. Alümina altlık üzerine, gümüş alt elektrot uygulanarak kürlleme işlemi gerçekleştirilmiştir. Ardından serigrafî yöntemi kullanılarak hazırlanan 65PMN-PT esaslı macunlarla 50 μm kalınlığa sahip kaplamalar gerçekleştirilmiş ve 850 °C’de sinterleme işlemine tabi tutulmuştur. Gümüş kullanılarak üst elektrot uygulaması ve kürlleme işleminin tamamlanmasının ardından kutuplama işlemi gerçekleştirilmiştir. Yapılan ölçümler sonrasında macun kompozisyonu içerisindeki frit oranının artmasıyla, piezoelektrik yük sabiti ve kapasitans değerlerinde bir düşüş olduğu tespit edilmiştir. Bunun yanı sıra kompozisyon içerisine frit eklenmesinin, kalın film yapısındaki yapışma dayanımını iyileştirdiği belirlenmiştir.

Anahtar Kelimeler: Piezoelektrik kalın film, PMN-PT, Serigrafî, Piezoelektrik macun.

DETECTION OF EARTHQUAKE DAMAGES WITH SATELLITE IMAGERY AND DEEP LEARNING APPROACHES

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Abstract

The use of Deep Learning methods in Earth Observation through Remote Sensing has shown great potential in various applications. In this study, we present a fast and efficient method for damage detection in post-earthquake regions using Deep Learning. On February 6, 2023, an earthquake of magnitudes 7.7 and 7.6 struck the Gaziantep and Kahramanmaraş regions of Turkey, causing significant damage to infrastructure and buildings. Our proposed method leverages the power of Deep Learning to detect damage quickly and accurately. We conducted multiple damage detection experiments by using post-earthquake satellite images of the affected regions. Our approach involved training a Convolutional Neural Network (CNN) model on a large dataset of annotated images to detect damage and classify it into different levels. We utilized a custom dataset of annotated post-earthquake satellite images for training. Two state-of-the-art Deep Learning architectures, UNet-ResNet34 and DeepLabv3-ResNet34, were employed as our models. The models were trained to identify and classify different levels of damage using the annotated dataset. Based on the experiments, the optimal image size, epoch size, batch size, and stride size were 4, 256x256, 50, and 128, respectively, for the training dataset. Comparative analysis revealed that the DeepLabv3 architecture showed superior results with a precision value of more than 86 percent, while UNet had more than 75 percent precision in identifying the four damage degrees, such as collapsed, heavily damaged, damaged, and slightly damaged, in the post-earthquake regions. The findings demonstrate the effectiveness of Deep Learning methods, specifically the DeepLabv3-ResNet34 model, in detecting and categorizing damage accurately and efficiently. Our results showed that the proposed method achieved high accuracy and precision in detecting damage in the affected regions. The outcomes of this study can be applied to other earthquake-affected areas, enabling efficient post-disaster assessment and targeted response strategies.

Keywords: *Satellite imagery, Earthquake damage assessment, Deep learning, Natural disaster management, Computer vision.*

UYDU GÖRÜNTÜLERİ VE DERİN ÖĞRENME YAKLAŞIMLARIYLA DEPREM HASARLARININ TESPİTİ

Özet

Uzaktan Algılama yoluyla Yer Gözlemi alanında Derin Öğrenme yöntemlerinin çeşitli uygulamalarda büyük potansiyel gösterdiği görülmüştür. Bu çalışmada, Türkiye'nin Gaziantep ve Kahramanmaraş bölgelerini etkileyen 6 Şubat 2023 tarihindeki 7.7 ve 7.6 büyüklüğündeki depremlerdeki hasarları hızlı ve etkili bir şekilde tespit etmek için Derin Öğrenme kullanarak hızlı ve verimli bir yöntem sunulmaktadır. Önerdiğimiz yöntem, Derin Öğrenmenin gücünden yararlanarak hasarı hızlı ve doğru bir şekilde tespit etmektedir. Etkilenen bölgelerin deprem sonrası uydu görüntülerini kullanarak birden fazla hasar tespiti deneyi gerçekleştirildi. Yakınlaştırılmış bir veri kümesi üzerinde bir Derin Sinir Ağı (CNN) modelini eğiterek hasarı tespit etmek ve farklı seviyelere sınıflandırmak için bir yöntem kullanıldı. Eğitim için özel olarak etiketlenmiş deprem sonrası uydu görüntülerinden oluşan bir veri seti kullanıldı. İki Derin Öğrenme mimarisi olan UNet-ResNet34 ve DeepLabv3-ResNet34 modelleri tercih edildi. Modeller, etiketli veri kümesini kullanarak farklı hasar seviyelerini belirlemek ve sınıflandırmak için eğitildi. Deneylere dayanarak, eğitim veri kümesi için en uygun görüntü boyutu, batch, epok, ve adım (stride) boyutu sırasıyla 256x256, 4, 50 ve 128 oldu. Karşılaştırmalı analizler, DeepLabv3 mimarisinin, deprem sonrası bölgelerde yıkılmış, ağır hasarlı, hasarlı ve hafif hasarlı gibi dört hasar derecesini belirlemede %86'dan daha yüksek bir doğruluk değeri gösterdiğini ortaya koymuştur. Buna karşın, UNet modeli ise %75'ten fazla doğruluk değeri göstermiştir. Bulgular, özellikle DeepLabv3-ResNet34 modelinin hasarı doğru ve verimli bir şekilde tespit etmede Derin Öğrenme yöntemlerinin etkinliğini göstermektedir. Sonuçlar, önerilen yöntemin etkilenen bölgelerde hasarı yüksek doğruluk ve hassasiyetle tespit ettiğini göstermektedir. Bu çalışmanın sonuçları, diğer depremden etkilenen alanlara uygulanarak verimli bir deprem sonrası değerlendirme ve hedefe yönelik müdahale stratejilerine olanak sağlayabilir.

Anahtar Kelimeler: *Uydu görüntüleri, Deprem hasar değerlendirmesi, Derin öğrenme, Doğal afet yönetimi, Bilgisayarlı görü.*

DETECTION OF DEFECTS IN MOLDED SHEETS USING THE MFL METHOD: AN ANISOTROPIC MAGNETO-RESISTIVE SENSOR APPLICATION

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Abstract

Stainless steel sheets are used in many vehicle parts in the automobile industry due to their high strength properties. These sheet metal parts are subjected to bending and warping during the forming process, which can lead to deformation defects such as tearing and thickness variations. Although numerical simulations and new forming technologies are used to prevent deformation in sheet metal parts, deformation can still occur in the formed sheet due to variations in mechanical properties based on the manufacturing company and even within different regions of a sheet roll. If a sheet metal part that has been torn as a result of deformation is assembled and painted on a car without being noticed during a preliminary inspection and then placed in a drying oven, all defects in the sheet metal will become apparent as it expands under high temperature. Detecting defects at this stage increases the cost. In most car factories worldwide, the preliminary inspection process is typically conducted through visual and manual checks under proper lighting conditions. The success rate of this visual inspection, which takes approximately 6 seconds, is associated with the performance of the personnel involved and is often found to be inadequate. Accordingly, this study aims to use the Magnetic Flux Leakage (MFL) method to detect defects that may occur in shaped sheets. This method, which is based on the detection of whether there is any magnetic flux leakage on the sheet after it is magnetized, utilizes the KMZ51 anisotropic magnetoresistive sensor as the detector. The success of this method in identifying tearing defects in the sheet metal has been discussed within the scope of the paper.

Keywords: Tear Flaw, MFL Method, Anisotropic Magnetoresistive Sensor.

KALIP İLE ŞEKİLLENDİRİLEN SAÇLARDA MFL YÖNTEMİ KULLANILARAK KUSURLARIN BELİRLENMESİ: BİR ANİZOTROPİK MAGNETO-REZİSTİF SENSÖR UYGULAMASI

Özet

Paslanmaz çelik saçlar yüksek mukavemet özelliklerine sahip olması nedeniyle otomobil endüstrisinde birçok araç parçasında kullanılmaktadır. Bu saçların şekillendirme aşamasında eğme ve bükme işlemlerinden geçirilirken yırtılma ve kalınlık değişimi gibi deformasyon hataları meydana gelebilmektedir. Saçlardaki deformasyonun önlenmesi için sayısal simülasyonlar ile yeni şekillendirme teknolojileri kullanılsa da sacın mekanik özelliklerinin üretildiği firmaya göre değişmesi ve bu özelliğin bir sac rulosunun değişik bölgelerinde bile farklılık göstermesi yüzünden şekillendirilen sacda deformasyonlar görülmektedir. Deformasyon sonucu yırtılmış, ön incelemeden geçmiş bir sac, otomobile monte edilerek boyanır ve ardından bir kurutma fırınına sokulursa, yüksek sıcaklık altında genişleyen sacdaki tüm kusurlar belirgin hale gelecektir. Bu aşamada kusurların tespit edilmesi ise maliyeti yükseltmektedir. Dünya çapındaki çoğu otomobil fabrikasında, ön inceleme süreci çoğunlukla ışık altında gözle ve elle kontrol edilerek gerçekleştirilmektedir. Yaklaşık 6 saniyede gerçekleşen bu görsel denetimin başarı oranı görevli personelin performansı ile ilişkilidir ve yeterli değildir. Bu doğrultuda bu çalışmada şekillendirilmiş saçlarda oluşabilecek kusurların tespitinde Manyetik akı kaçağı (MFL) yönteminin kullanılması hedeflenmiştir. Sacın manyetize edilmesi ile üzerinde manyetik akı kaçağı olup olmadığının tespitine dayanan bu yöntemde algılayıcı olarak KMZ51 anizotropik magnetoresistive sensör kullanılmıştır. Bu yöntemin sacdaki yırtılma kusurlarını belirlemedeki başarısı bildiri kapsamında tartışılmıştır.

Anahtar Kelimeler: Yırtılma Kusuru, MFL Yöntemi, Anizotropik Magneto-rezistif Sensör.

NUMERICALLY INVESTIGATION OF THE EFFECTS OF THE CHEVRON ANGLE ON THE THERMAL PERFORMANCE OF A PLATE HEAT EXCHANGER

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Abstract

Plate heat exchangers are widely used in heating and cooling applications, refrigeration, chemical, food industries, etc. In addition, other reasons for the selection the plate heat exchangers are the compact structure and having a large heat transfer area with a lower volume than other types of heat exchangers. In this study, the hydrothermal performance of a gasketed plate heat exchanger with a variable chevron angle was numerically investigated by using the generated computational fluid dynamics (CFD) models. In the present study, both the rating and sizing parameters of the heat exchanger were examined. The numerical study was performed under different hot water inlet temperature conditions by using the plate heat exchanger models that generated different chevron angles. The numerical model was first validated by comparison with experimental data obtained from the experimental study that was also performed in this study. And it was observed that the numerical results were in good agreement with the results of the experimental study. The Nusselt number (Nu) and the friction factor (f) values were evaluated by using the correlations obtained from the studies performed in similar conditions and the results from the numerical analyses. According to the results of the numerical analyses, as the temperature difference between the inlet sides of the heat exchanger increased, the total heat transfer rate increased as expected. However, it was also observed that the change in temperature difference did not have a considerable effect on the pressure drop. As the chevron angle increased, although a decrease was observed in the total heat transfer rate values under all cold water inlet temperature and mass flow rate conditions, a noticeable decrease was observed in the pressure drop.

Keywords: Plate heat exchanger, Chevron Angle, CFD.

MODELING OF NUMBER OF TRAFFIC ACCIDENT IN ANKARA WITH REGRESSION AND DECISION TREE METHODS

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Abstract

The purpose of the use of road transport systems is to transport people, goods, animals, foodstuffs from one place to another in an efficient, healthy and reliable manner. Traffic accidents and adverse events on the road disrupt the functioning of the road system. According to the data of the World Health Organization (WHO), approximately 1.3 million people lose their lives as a result of traffic accidents each year and nearly 50 million people are injured. In the world report on the prevention of traffic accidents, prepared jointly by the WHO and the World Bank, it is stated that road traffic accidents are a major public health and development problem. Many risk factors such as weather conditions, driver's socio-economic status and education level, road design/environment and geometric features, driving speed, and legal speed limit of the road can be reason in the occurrence of traffic accidents. This study aims to determine the risk factors affecting the number of accidents by focusing on the number of traffic accidents in the state roads of Ankara province and its districts. The dataset of this study were obtained from the Ankara Police Department Traffic Branch, legally. The number of traffic accidents in Ankara in 2016-2021 is modeled with regression models and decision tree methods in accordance with the count data, and the risk factors affecting the accident were determined. Decision tree algorithms combined with count regression models were utilized in the analysis of the data set. In addition, the number of traffic accidents and related risk factors are described with appropriate data visualization techniques.

Keywords: Number of traffic accident, Count regression, Decision tree

ANKARA İLİNDE TRAFİK KAZA SAYILARININ REGRESYON VE KARAR AĞACI YÖNTEMLERİ İLE MODELLENMESİ

Özet

Karayolu taşıma sistemlerinin kullanımının amacı insanları, eşyaları, hayvanları, gıda maddelerini verimli, sağlıklı ve güvenilir olarak bir yerden bir yere taşımaktır. Trafik kazaları ve yolda meydana gelen çalışmalar olumsuzluklar karayolu sisteminin işleyişini bozmaktadır. Dünya Sağlık Örgütü (DSÖ) verilerine göre her yıl trafik kazaları sonucu yaklaşık 1.3 milyon insan hayatını kaybetmekte ve 50 milyona yakın insan da yaralanmaktadır. DSÖ ve Dünya Bankası'na ortak olarak hazırlanan trafik kazalarının önlenmesine ilişkin dünya raporunda, karayolu trafik kazaları büyük bir halk sağlığı ve gelişim sorunu olduğu belirtilmiştir. Trafik kazalarının oluşmasında hava şartları, sürücünün sosyo-ekonomik durumu ve eğitim düzeyi, yolun tasarımı/ çevresi ve geometrik özellikleri, sürüş hızı, yolun yasal hız limiti gibi bir çok risk faktörü etkili olabilir. Bu çalışma Ankara ili ve ilçeleri devlet yolları özelinde trafik kaza sayılarına odaklanarak kaza sayılarına etki eden risk faktörlerini belirlemeyi amaçlamıştır. Bu çalışmada kullanılan veriler Ankara Emniyet Müdürlüğü Trafik Şube Başkanlığı'ndan temin edilmiştir. Ankara ilinde 2016-2021 yılında gerçekleşen trafik kaza sayıları sayım verilerine uygun regresyon modelleri ve karar ağacı yöntemleri ile modellenerek ve kazaya etki eden risk faktörleri belirlenmiştir. Sayım regresyon modelleri ile birleştirilen karar ağacı algoritmaları veri setinin analizinde yararlanılmıştır. Ayrıca, uygun veri görselleştirme teknikleri ile trafik kaza sayıları ve ilgili risk faktörleri betimlenmiştir.

Anahtar Kelimeler: Trafik kaza sayıları, Sayım regresyonu, Karar ağacı

EVALUATION OF KNOWLEDGE, ATTITUDES AND BEHAVIORS OF HEALTH SCIENCES FACULTY STUDENTS ABOUT INFECTIOUS DISEASES: ÇANAKKALE CASE

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Abstract

Infectious diseases are defined as the entry, establishment, and proliferation of disease-causing microorganisms in the body by any means (CDC). Infectious diseases pose a major threat to public health worldwide. Having accurate and up-to-date information on infectious diseases for the students of the faculty of health sciences is of great importance in preparing them for their future roles in health services. The aim of this research is to examine the level of knowledge and attitudes of health sciences students about the spread, prevention, and treatment of infectious diseases. In the study, an online questionnaire was applied to 651 participants consisting of Çanakkale Onsekiz Mart University (ÇOMÜ) Faculty of Health Sciences, Midwifery, Nursing, and Emergency Aid and Disaster Management (AYAY) department students using the descriptive research method. The questionnaire form used as a data collection tool was created by the researchers in line with the literature. The questionnaire form consists of four parts. Participants were asked 9 questions in the first part to determine their socio-demographic characteristics; 13 questions in the second part to evaluate their general knowledge level and attitudes about infectious diseases (BH); 12 questions in the third part to evaluate their knowledge and attitudes about bacterial infectious diseases (BK); and finally, 13 questions in the fourth part to determine their knowledge and attitudes about the prevention and control of infectious diseases. Within the scope of the study, institutional permission, ethics committee permission, and a voluntary consent form were obtained for the participants. According to the results obtained, the highest participation was in nursing (39.1%) on a departmental basis and first-year students (35.1%) on a class basis. 22.9% of the participating students are 21 years old, 82.5% are women, and 87.1% are not working. The number of participants who received training on infectious diseases is 45.4%, the number of participants with a chronic disease is 6.9%, and the number of participants diagnosed with an infectious disease is only 0.2%. When the data is examined, it is seen that male students have more knowledge in the Infectious Diseases Knowledge Level factor than women, while women have more information than men in all other factors. When the averages of the factors are compared according to the status of having received education and not having received education, it is concluded that the individuals who have received any education about infectious diseases have more information, with an average of 74.2534 General Knowledge Level and an average of 4.6349 General Attitude. The same result is obtained when all other factors are compared. It is seen that the averages of BH Attitude, BK Infectious Disease Attitude, BH Prevention and Control Attitude, General Attitude, and BH Prevention and Control Knowledge Level are higher in midwifery department students. It is concluded that the averages of BH Knowledge Level, BK Infectious Diseases Knowledge Level, and General Knowledge Level are mostly among AYAY department students. It is thought that the research will shed light on future studies in terms of preparing education programs to improve students' knowledge, attitudes and behaviors on infectious diseases and will contribute to the training of more knowledgeable health workers for future interventions.

Keywords: Infectious Diseases, Bacterial, Prevention and Control, Knowledge, Attitude

SAĞLIK BİLİMLERİ FAKÜLTESİ ÖĞRENCİLERİNİN BULAŞICI HASTALIKLAR HAKKINDA BİLGİ TUTUM VE DAVRANIŞLARININ DEĞERLENDİRİLMESİ: ÇANAKKALE ÖRNEĞİ

Özet

Bulaşıcı hastalıklar, hastalık yapıcı mikroorganizmaların herhangi bir yolla vücuda girmesi, yerleşmesi ve çoğalarak yayılması olarak tanımlanmaktadır (CDC). Bulaşıcı hastalıklar dünya çapında halk sağlığı için büyük bir tehdit oluşturmaktadır. Sağlık bilimleri fakültesi öğrencilerinin bulaşıcı hastalıklar konusunda doğru ve güncel bilgilere sahip olması onların gelecekte sağlık hizmetlerindeki rollerine hazırlanmaları için son derece büyük bir öneme sahiptir. Bu araştırmanın amacı sağlık bilimleri fakültesi öğrencilerinin bulaşıcı hastalıkların yayılımı, korunma ve tedavileri hakkında bilgi düzeyi ve tutumlarını incelemektir. Çalışmada Çanakkale Onsekiz Mart Üniversitesi (ÇOMÜ) Sağlık Bilimleri Fakültesi Ebelik, Hemşirelik ve Acil Yardım ve Afet Yönetimi (AYAY) bölüm öğrencilerinden oluşan 651 katılımcıya tanımlayıcı araştırma yöntemi kullanılarak çevrimiçi anket uygulaması yapılmıştır. Veri toplama aracı olarak kullanılan anket formu literatür doğrultusunda araştırmacılar tarafından oluşturulmuştur. Anket formu dört bölümden oluşmaktadır. Katılımcılara birinci bölümde sosyo-demografik özelliklerini belirlemeye yönelik 9 soru, ikinci bölümde

bulaşıcı hastalıklar (BH) hakkında genel bilgi düzeyi ve tutumlarını değerlendirmeye yönelik 13 soru, üçüncü bölümde bakteriyel kökenli (BK) bulaşıcı hastalıklar hakkında bilgi ve tutumlarının değerlendirmesine yönelik 12 soru ve son olarak dördüncü bölümde bulaşıcı hastalıkları önleme ve kontrol hakkında bilgi ve tutumlarını belirlemeye yönelik 13 soru yöneltilmiştir. Çalışma kapsamında kurum izni, etik kurul izni ve katılımcılar için gönüllü onam formu alınmıştır. Elde edilen sonuçlara göre en yüksek katılım bölüm bazında hemşirelik (%39,1), sınıf bazında da 1. sınıf öğrencilerinden (%35,1) oluşmuştur. Katılım sağlayan öğrencilerin %22,9'u 21 yaşında, %82,5'i kadın ve %87,1'i çalışmamaktadır. Bulaşıcı hastalıklar hakkında eğitim alan katılımcı sayısı %45,4, kronik bir hastalığa sahip katılımcı sayısı %6,9 ve bulaşıcı bir hastalık tanısı konmuş katılımcı sayısı yalnızca %0,2'dir. Veriler incelendiğinde Erkek öğrencilerin BH Bilgi Düzeyi faktöründe kadınlara oranla daha fazla bilgiye sahip olduğu, kadınların ise diğer tüm faktörlerde erkeklere oranla daha fazla bilgiye sahip olduğu görülmektedir. Eğitim almış olma ve eğitim almamış olma durumlarına göre faktörlerin ortalamaları kıyaslandığında, Genel Bilgi Düzeyi 74,2534 ortalama ve Genel Tutum 4,6349 ortalama ile bulaşıcı hastalıklar hakkında herhangi bir eğitim almış bireylerin eğitim almayan bireylere oranla daha fazla bilgiye sahip olduğu sonucuna varılmaktadır. Diğer tüm faktörler kıyaslandığında da aynı sonuç elde edilmektedir. BH Tutumu, BK Bulaşıcı Hastalık Tutumu, BH Önleme ve Kontrol Tutumu, Genel Tutum, BH Önleme ve Kontrol Bilgi Düzeyi ortalamalarının Ebelik bölümü öğrencilerinde daha fazla olduğu görülmektedir. BH Bilgi Düzeyi, BK Bulaşıcı Hastalık Bilgi Düzeyi, Genel Bilgi Düzeyi ortalamalarının çoğunluk olarak AYAY bölümü öğrencilerinde olduğu sonucuna varılmaktadır. Araştırmanın, öğrencilerin bulaşıcı hastalıklar konusundaki bilgi, tutum ve davranışlarını geliştirmeye yönelik eğitim programlarının hazırlanması açısından gelecekte yapılacak çalışmalara ışık tutacağı ve gelecekteki müdahaleler için daha bilgili sağlık çalışanlarının yetiştirilmesine katkı sağlayacağı düşünülmektedir.

Anahtar Kelimeler: Bulaşıcı Hastalıklar, Bakteriyel, Önlem ve Kontrol, Bilgi, Tutum

NEXT-GENERATION HANDWRITING RECOGNITION SYSTEM IMPLEMENTED WITH MICROCONTROLLER EMBEDDED DEVICE

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Abstract

This study focuses on an advanced handwriting recognition system implemented using a microcontroller-based embedded device. This innovative system utilizes a 9-axis IMU sensor embedded in the microcontroller, which includes features such as an accelerometer, gyroscope, and magnetometer, to identify characters generated by a person while writing. This advanced technology has the ability to convert a person's handwriting into a digital format. This feature enables computers to understand written text, allowing for more effective utilization of written information in digital environments. Our system is a writer-independent solution that recognizes characters written on plain paper using a specially equipped pen with a sensor. This pen provides linear acceleration, angular velocity, magnetic field, and force applied by the user. These analog signals are transformed into a time series data of the movements occurring while writing. This transformation process enables the recognition and processing of the written characters in a digital environment. This system is applicable in real-world applications and requires personalized training for recognition. This training process enables the system to learn the user's writing style and utilize this knowledge during the character recognition process. This personalized training enhances the accuracy and effectiveness of the system. The aim of this study is to provide a real-time handwriting recognition system, enabling real-time recognition while a person is writing. This can be particularly time-saving in scenarios where documents need to be digitized and further processed. This feature enhances the efficiency and usability of the system. This technology represents a significant advancement in the field of handwriting recognition. Traditional handwriting recognition systems typically require pre-training to recognize the handwriting of specific individuals. However, this system employs a writer-independent approach. This means that our system can recognize the handwriting of any individual. This feature enables the system to be usable by a wide range of users and makes it applicable for numerous applications. This study sheds light on the future development of handwriting recognition technology, and it is believed that advancements in this field will further expedite access to information and information processing.

Keywords: Microcontroller Embedded Device, IMU Sensor, Handwriting Recognition, Writer-Independent, Real-Time Recognition, Digitization, Character Recognition, Machine Learning, Artificial Intelligence.

MİKRODENETLEYİCİ UÇ CİHAZ İLE GERÇEKLEŞTİRİLEN YENİ NESİL YAZI TANIMA SİSTEMİ

Özet

Bu çalışma, bir mikrodnetleyici uç cihaz kullanarak gerçekleştirilen ileri düzey bir yazı tanıma sistemi üzerine odaklanmaktadır. Bu yenilikçi sistem, mikrodnetleyici üzerinde yerleşik olan ve ivmeölçer, jiroskop, manyetometre gibi özelliklere sahip olan 9 Eksen IMU Sensörü'nü kullanarak, kişinin yazı yazarken oluşturduğu karakterleri tanımlamaktadır. Bu gelişmiş teknoloji, bir kişinin yazısını dijital formata dönüştürme yeteneğine sahiptir. Bu özellik, yazılı metinlerin bilgisayarlar tarafından anlaşılmasını sağlar ve bu sayede yazılı bilginin dijital ortamlarda daha etkin bir şekilde kullanılmasına olanak sağlar. Sistemimiz, bir sensörle donatılmış özel bir kalem kullanarak düz kağıda yazılan karakterleri tanıyan yazar bağımsız bir sistemdir. Bu kalem, kullanıcının uyguladığı lineer ivmeyi, açısal hızı, manyetik alanı ve kuvveti sağlar. Bu analog sinyaller, yazı yazarken oluşan hareketlerin zaman serisi verisine dönüştürülür. Bu dönüşüm süreci, yazılan karakterlerin dijital ortamda tanınmasını ve işlenmesini sağlar. Bu sistem, gerçek dünya uygulamalarında kullanılabilir ve tanıma için kullanıcıya özgü bir eğitim gerektirir. Bu eğitim süreci, sistemin kullanıcının yazı stilini öğrenmesini ve bu bilgiyi yazıyı tanıma sürecinde kullanmasını sağlar. Bu özelleştirilmiş eğitim süreci, sistemin doğruluğunu ve etkinliğini artırır. Bu çalışma, gerçek zamanlı bir yazı tanıma sistemi sağlamayı hedeflemektedir. Bu sistem, bir kişinin yazı yazarken gerçek zamanlı olarak tanıma uygulamasını mümkün kılar. Bu, özellikle belgelerin dijitalleştirilmesi ve daha sonra işlenmesi gereken durumlarda büyük zaman kazandırabilir. Bu özellik, sistemin verimliliğini ve kullanılabilirliğini artırır. Bu teknoloji, yazı tanıma alanında önemli bir ilerleme sağlar. Geleneksel yazı tanıma sistemleri genellikle belirli bir yazarın yazısını tanımak için önceden eğitilmiş olmalıdır. Ancak bu sistem, yazar bağımsız bir yaklaşım kullanır. Bu, sistemimizin herhangi bir kişinin yazısını tanıyabilmesi anlamına gelir. Bu özellik, sistemin geniş bir kullanıcı kitlesi tarafından kullanılabilir olmasını sağlar ve onu birçok uygulama için uygulanabilir kılar. Bu çalışma, yazı tanıma teknolojisinin gelecekteki gelişimine ışık tutmaktadır ve bu alandaki ilerlemelerin, bilgiye erişim ve bilgi işleme süreçlerini daha da hızlandıracağına inanılmaktadır.

Anahtar Kelimeler: Mikrodnetleyici Uç Cihaz, IMU Sensörü, Yazı Tanıma, Yazar Bağımsız, Gerçek Zamanlı Tanıma, Dijitalleştirme, Karakter Tanıma, Makine Öğrenmesi, Yapay Zeka.

SYSTEM-LEVEL DESIGN SPACE EXPLORATION BY USING SYMBOLIC CONTROL

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Abstract

This paper presents, a systematic modeling framework by using the symbolic discrete controller synthesis technique, that allows for faster and more effective design in the early design stages of the system-level in line with the given desired design criteria. We consider the design space exploration for the system-level design as a discrete control synthesis problem in our work. Design state exploration is a process that is carried out to find the most suitable candidate, which best meets the design requirements among many design alternatives, before the implementation of a design. Design space exploration at the system level is inherently complex due to the trade-off between some performance metrics. This aspect represents a significant design constraint in modern embedded systems, imposing limitations on performance, battery life, and various other metrics. In our study, we present the details of our symbolic approach by means of the discrete controller synthesis technique with a case study by addressing the processing of tasks on processors in multiprocessor system-on-chips in terms of energy and performance criteria; where discrete controller synthesis is a technique for automatically generating controllers to achieve desired system behaviors and design objectives. Firstly, we abstract the processors and tasks by associating them with our design objectives and model them as data-flow equations in the context of synchronous languages. Then, we synthesize controllers that meet the design objectives and system behaviors through the application of safety and optimization synthesis algorithms. The safety objective facilitates the enforcement of mutual constraints, while the optimization objective is employed to minimize energy consumption. As a result, these controllers allow configurations that satisfy the design objectives and system behaviors. In this process, the design objectives are used to narrow down the design space by considering a limited number of values for parameter n . Finally, we reach a small number of design candidates, which can be exemplified as low, medium, and high-performance designs. Through our case study, we experimentally validated our synthesis algorithms and framework, demonstrating that our approach is more effective in the design space exploration domain compared to commonly employed other existing techniques such as heuristic and machine learning. Undoubtedly, conducting future research that considers additional performance metrics such as temperature, and size, and incorporates multi-objective criteria would further highlight the impact of the symbolic control approach in this field. This would provide deeper insights into the effectiveness of the symbolic control approach and its implications for optimizing system performance in a more comprehensive manner.

Keywords: *Discrete Event Systems, Symbolic Discrete Controller Synthesis, Design Space Exploration, System-level, Multiprocessor.*

ENDOVASCULAR MANAGEMENT OF SPONTANEOUS LUMBAR ARTERY HEMORRHAGE

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Abstract

Introduction: Spontaneous hemorrhage (SH) originating from the lumbar artery detected on CT is life-threatening condition. The aim of this study is to investigate the success of transcatheter arterial embolization (TAE) for the management of SH originating from lumbar artery and to assess the effectiveness of computed tomography (CT) in the treatment planning process. **Materials and methods:** From June 2015 to June 2018, 10 patients with signs of bleeding on CT images and underwent digital subtraction angiography (DSA) were evaluated. Angiograms and CT images were evaluated to determine the hemorrhage location and the presence of extravasation. Relationship between CT and angiography results and the clinical and technical effectiveness of endovascular procedures were evaluated. **Results:** Pre-operative CT images revealed active leak of contrast media in 8 of 10 (80%) patients. One patient had spinal arterio-venous malformation and the other had retroperitoneal hematoma with no active contrast media extravasation. DSA identified active extravasation in all patients (100%). Lumbar arteries of all patients were embolised by TAE. Embolization procedures were performed with N-Butyl 2-Cyanoacrylate (NBCA) diluted with iodized oil in seven procedures (70%), NBCA and microspheres (HydroPearl, Terumo) in one procedure (10%), microspheres in one procedure (10%), and microspheres and coil in one procedure (10%). No major procedure-related complications occurred. Technical success for TAE was 100%. **Conclusion:** TAE is a safe and effective treatment method for life-threatening lumbar artery hemorrhage. Pre-operative CT evaluation enhance technical success of TAE because it helps to target potentially bleeding arteries.

Keywords: Hemorrhage, Transcatheter arterial embolization, Computed tomography.

INVESTIGATION OF TREATED WASTE WATER USAGE OPPORTUNITIES OF KONYA SELÇUKLU AND KARATAY DISTRICT FARMERS

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Abstract

It is estimated that the world population will increase to approximately 9 billion by 2050, therefore, the access to the fixed, unchanging and constantly moving water on the earth, which is the life source of the earth, in sufficient quantity and quality, becomes limited. Usable water is shared between domestic use, industrial use and use in agricultural irrigation, varying over the years, and the largest share is still in agricultural use in our country due to the inefficient use of irrigation technologies. With the fact that drought, which is the negative result of global warming and climate change, is felt today, water use competition between stakeholders is increasing, and solutions are sought for the increase in agricultural irrigation water need due to the security and continuity of food supply. While the increasing population causes a decrease in the per capita food supply and water amount, it also leads to an increase in the amount of wastewater. Due to the increase in water consumption day by day and the limited available water resources, wastewater should be used under appropriate methods and standards. This situation provides a great advantage in terms of protecting clean water resources. The concepts of fully purified, partially treated or directly used domestic, urban and industrial wastewater are constantly on the agenda as an alternative water source. Studies on this subject are also needed. In a part of the master's thesis study conducted with this requirement, in addition to the use of good quality water as irrigation water used by farmers in 12 neighborhoods in Selçuklu and Karatay districts of Konya province, the possibilities of using treated wastewater were investigated. For this purpose, 77 questions prepared in detail were asked to 100 regional farmers, and the current situation was evaluated by conducting face-to-face surveys with respect to producers and consumers. As a result of the research, all of the regional farmers who cultivate field crops and do not use treated wastewater stated that they experience water shortages. With the answers they gave to the survey questions, they said that there is a treatment plant in their region and it has become a necessity to reuse the wastewater treated in these facilities, especially during periods when irrigation water is insufficient, that they are willing to be a part of this issue, that this existing water is available to more farmers in more areas are indicated.

Keywords: *Agricultural watering, Waste water, Purified Waste Water Usage, Farmer.*

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ANALYSIS OF DIFFERENT FIXATION METHODS IN CRANIAL IMPLANTS BY FINITE ELEMENT METHOD

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Abstract

The purpose of this project is modelling cranial implants with various fixation method and make analysis in certain conditions . The modelling of implant was made with Solidworks program. Three different fixation methods were used for this model. These fixation methods are miniplate and screw, clamp fixation and wire fixation. After modelling process we analyzed the model in certain conditions with Ansys Workbench program. 50 N outer force and 15 mm-Hg pressure were applied for all models .The material of implants are PMMA(Polymethyl methacrylate) and PEEK(Polyether Ether Ketone). In addition pre-loads were applied the equipments which were used for fixation of implant. By doing this we tried to find the realistic results. According to our research this method was never used before. According to our research only miniplate and screw fixation was examined by finite element method. But we analyzed other fixation methods,too. According to results in Ansys Workbench Program, in miniplate and screw fixation method the highest strain values are 0,016 mm and 0,020 mm, but the highest stress values are 2,8 MPa and 2,2 MPa for PEEK and PMMA implants respectively. In clamp fixation same values are 0,013 mm and 0,017 mm and 0,0003 MPa and 0,00022 MPa. In wire fixation same values are 0,255 mm and 0,26 mm and 21,85 MPa and 21,9 MPa. When we examined the stresses of implants even clamp fixation has the best mechanical behaviour, the stresses were more intense on clamps and deformity is recognizable. If this fixation method is going to be used, finite element method should be used before operation.

Keywords: Finite Element Method, Cranial Implant, Fixation Methods.

KRANIAL İMPLANTLARDA FARKLI TESPİT YÖNTEMLERİNİN SONLU ELEMANLAR YÖNTEMİ İLE ANALİZİ

Özet

Bu çalışmanın amacı kafatası kemikleri(kranial) için kullanılan implantların çeşitli tespit yöntemleriyle modellenmesini yapmak ve belirli şartlarla analizini yapıp karşılaştırma yapmaktır. Kafatası implantının modellenmesi Solidworks programıyla yapılmıştır. Modellemede üç farklı bağlama yöntemi kullanılmıştır. Bu yöntemler sırasıyla miniplak ve civata ile, clamp ile ve tel ile bağlama yöntemleridir. Modelleme işlemini tamamladıktan sonra Ansys Workbench programıyla belirli şartlar altında analizi yapılmıştır. Yapılan modeller 50 N dış yük altında ve 15 mm-Hg basınç altında analizi yapılmıştır. İmplant malzemesi olarak PMMA(Polimetil metakrilat), PEEK(Poli Eter Eterketon) malzeme kullanılmıştır. Bununla beraber implantları bağlama amaçlı kullanılan makine elemanlarına ön yüklemeler verilerek daha gerçekçi sonuçlar elde edilmek istenmiştir. Araştırmalarımıza göre daha önce yapılan çalışmalarda fiksasyonda kullanılacak makine elemanlarında ön yüklemeler yapılmamıştır. Bununla beraber akademik alanda daha çok mini plak ve civatayla bağlama yöntemiyle sonlu elemanlar çalışması yapılmıştır. Yaptığımız araştırmalara göre kafatası implantları için diğer bağlama yöntemlerinin sonlu elemanlar çalışması yapılmamıştır. Bu nedenle bu alanda çalışma yapılarak en iyi cerrahi yöntem bulunmaya çalışılmıştır. Ansys Workbench programıyla yapılan sonuçlara göre. Miniplak ve vida ile bağlama yönteminde PEEK, PMMA malzemede en fazla şekil değiştirme değerleri sırasıyla 0,016 mm ve 0,020 mm dir. Yine aynı bağlama yönteminde en fazla gerilme değerleri sırasıyla 2,8 MPa ve 2,2 MPa dır. Clamp yöntemiyle bağlama metodunda aynı değerler sırasıyla 0,013 mm ve 0,017 mm dir. Gerilme değerleri ise 0,0003 MPa ile 0,00022 MPa dir. Telle bağlama yönteminde aynı değerler sırasıyla 0,255 mm ve 0,26 mmdir. Gerilmeler 21,85 MPa ve 21,9MPa'dır. İmplantlar üzerindeki değerler incelendiğinde her ne kadar clamp ile bağlama yönteminin mekanik davranışı daha iyi gibi dursa da bağlantı bölgesinde yoğunlaşmış gerilmeler ve şekil bozukluğu dikkate değerdir. Bu nedenle bu yöntemle yapılacak ameliyatlardan önce kesinlikle öncesinde sonlu elemanlar çalışması yapılarak implant bağlama alınmalıdır.

Anahtar Kelimeler: Sonlu Elemanlar Yöntemi, Kafatası İmplantı, Bağlama Yöntemleri.

EFFECT OF GLASS FIBER STRUCTURE ON HEADLINER ACOUSTIC PERFORMANCE

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Abstract

The acoustic performance of automotive interiors plays a crucial role in providing a comfortable and quiet driving experience. One component that contributes to the acoustic performance is the headliner, which is the interior roof panel of a vehicle. Recognizing this importance, research has been conducted to develop a special thermoset composite material using Polyurethane rigid foam (PUR), non-woven surface, fiberglass, and binder. The study extensively investigated the influence of glass fiber structure. Two different glass fiber structure were meticulously compared in terms of their respective sound absorption coefficients. To evaluate the effectiveness of the developed composite materials, rigorous sound absorption coefficient tests were conducted in strict accordance with the industry-standard 7.R7401 specification for alpha cabin. The objective was to achieve sound absorption coefficients close to unity for frequencies above 2000 Hz to 10000 Hz, ensuring maximum attenuation of unwanted noise inside the vehicle cabin. The compelling results obtained from the study demonstrated the exceptional acoustic performance of the composite material featuring a both side glass fiber mat. Among the tested materials, it exhibited the highest sound absorption coefficient, serving as evidence of its remarkable capabilities. The measured sound absorption coefficients ranged from 0.78 to 0.92, indicating significant advancements in acoustic efficiency and noise reduction. In conclusion, the findings unequivocally highlight the positive influence of the glass fiber mat structure on enhancing the sound absorption coefficient, thereby providing electric vehicle passengers with an enhanced auditory experience. This pioneering research paves the way for further advancements in the field of acoustic engineering, catering to the ever-increasing demands for a serene and comfortable ride in the realm of electric mobility. As electric vehicles gain popularity, such innovations are believed to play a crucial role in improving passenger comfort and providing a more enjoyable journey. This study contributes significantly to the automotive industry and will guide the development of future electric vehicle designs.

Keywords: Headliner, Glass fiber, acoustic, alpha cabinet.

DEVELOPMENT AND OPTIMIZATION OF CARBOXYMETHYL CELLULOSE-REINFORCED BINDER FOR DIRECT INK WRITING METHOD

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Abstract

Various methods such as Powder Bed Fusion, Material Extrusion, Inkjet Printing, Directed Energy Deposition, Stereolithography and Binder Jetting are utilized in the additive manufacturing of metals. Due to the numerous advantages it possesses, numerous research has been conducted on Metal Material Extrusion-Based Additive Manufacturing (Metal MEX) technology, which is based on the extrusion of polymer-metal raw materials filled with a high volume fraction of metal powder. The raw materials used in Metal MEX can exist in solid forms such as filaments and granules, or in the viscoelastic form of pastes or inks. The viscoelastic "ink" in Metal MEX, which exhibits viscoelastic material behavior, is additively manufactured at room temperature using a piston-based approach, known as Direct Ink Writing (DIW) or robocasting. In DIW, the ink is produced by blending metal powders with a polymer-based binder. The binder is composed of a polymer, a solvent for the polymer, and various additives. The commonly used binders and solvents include Polylactic acid (PLA) - Dichloromethane (DCM), Chitosan-Acetic acid (C₂H₄O₂), and Polyvinyl alcohol (PVA) / Polyethylene glycol (PEG) - water. Since DCM and acetic acid have toxic properties and cause adverse effects on human health, non-toxic and water-soluble PEG and PVA-based binders were preferred in this study. A binder was produced in accordance with the method described in the literature by mechanically mixing 12% PVA, 10% PEG, 3% glycerin, and 75% water. It was observed that over time, the solvent function of water separates from the other components. To address this issue, Carboxymethyl cellulose (CMC), a cellulose-based, non-toxic, water-soluble, and biodegradable ether, was added to the binder at different weight percentages of 0, 0.5, 1, 1.5, 2, 2.5, 5, 7.5, and 10 to enhance the homogeneity of the binder due to its high binding capability. Particularly, at CMC concentrations of 1% and above, the problem of water separation was eliminated. Binders with varying compositions were prepared to investigate the effects of the added CMC on the green part strength of the binder. Nine different binders with different CMC ratios were filled into molds with dimensions of 80mm×10mm×5mm and left at room temperature until sufficient solidification was achieved. The prepared green part samples were subjected to flexural tests at a speed of 1 mm/min using a SCHIMADZU AGS-X 10N-10kN model testing machine after being kept at room temperature for 5 days. The effects of CMC concentration on the bending strength were examined. Depending on the increase in the CMC ratio in the binder from 0% to 10%, the flexural strength increases from 0.35 MPa to 5.1 MPa, while the elongation, which is the ductility measure, decreases from 15% to 1%. It was observed that green parts with CMC concentrations of 1.5% and below were highly ductile but had low strength. The increase in CMC concentration enhanced the bending strength and elastic modulus, leading to a positive effect on binder adhesion. However, it also resulted in a decrease in binder ductility, consequently generating more fragile green parts and making it challenging to preserve the binder after printing. Therefore, an optimum CMC concentration range of 1.5-2.5% was determined, which provided both sufficient flexibility and strength.

Keywords: Additive manufacturing, Direct Ink Writing, Three-point flexural test, Carboxymethyl cellulose.

DOĞRUDAN MÜREKKEP YAZMA INK YÖNTEMİ İÇİN KARBOKSİMETİL SELÜLOZ TAKVİYELİ BAĞLAYICI GELİŞTİRİLMESİ VE OPTİMİZASYONU

Özet

Metallerin eklemeli üretiminde Toz Yatak Füzyonu, Malzeme Ekstrüzyonu, Mürekkep Püskürtmeli Baskı, Doğrudan Enerji Biriktirme, Stereolitografi ve Bağlayıcı Püskürtme gibi çeşitli yöntemler kullanılmaktadır. Sunmuş olduğu birçok avantaj nedeniyle, yüksek oranda metal tozu ile doldurulmuş polimer-metal hammaddelerin ekstrüzyonuna dayanan Metal Malzeme Ekstrüzyon Esaslı Eklemeli İmalat (Metal MEX) teknolojisi üzerine birçok çalışma yapılmıştır. Metal MEX yönteminde kullanılan hammaddeler filament ve granül şeklinde katı bir formda ya da macun veya mürekkep şeklinde viskoelastik malzeme formunda olabilmektedir. Viskoelastik malzeme davranışı sergileyen "mürekkebin" oda sıcaklığında eklemeli olarak üretildiği piston bazlı Metal MEX yöntemi Doğrudan Mürekkep Yazma (DMY) veya robocasting olarak adlandırılmaktadır. DMY'de mürekkep, metal tozları ile polimer esaslı bağlayıcının karıştırılmasıyla oluşur. Bağlayıcı ise polimer, polimerin çözücüsü ve çeşitli katkı maddelerinden oluşmaktadır. En yaygın kullanılan bağlayıcılar ve çözücüler; Polilaktik asit (PLA) - Diklorometan (DCM), Kitosan - Asetik asit (C₂H₄O₂), Polivinil alkol (PVA) / Polietilen glikol (PEG) – Su olarak sıralanabilir. DCM ve asetik asit toksik özelliklere sahip olması ve insan sağlığı üzerinde olumsuz etkilere neden olduğundan dolayı bu çalışmada toksik olmayan ve suda çözünür PEG ve PVA bazlı bağlayıcı tercih edilmiştir. Ağırlıkça %12 PVA, %10 PEG, %3 Gliserin ve %75 suyun mekanik karıştırıcıda

karıştırılması suretiyle literatürde belirtilen metoda uygun olarak üretilen bağlayıcıda, çözücü görevi gören suyun zamanla diğer bileşenlerden ayrıldığı gözlemlenmiştir. Bu probleme çözüm üretmek amacıyla selüloz bazlı, toksik olmayan, suda çözünebilir ve biyolojik olarak parçalanabilir bir eter olan Karboksimetil selüloz (CMC) yüksek bağlayıcılık özelliği nedeniyle bağlayıcıyı daha homojen hale getirmek amacıyla ağırlıkça %0, 0.5, 1, 1.5, 2, 2.5, 5, 7.5, 10 oranlarında bağlayıcı içeriğine eklenmiştir. Özellikle %1 ve üzerindeki CMC konsantrasyonlarında suyun ayrışması problemi ortadan kalkmıştır. Bağlayıcıya ilave edilen CMC'nin yeşil parça mukavemeti, dolayısıyla bağlayıcının bağlayıcılığı üzerine etkilerini araştırmak amacıyla farklı bileşimlerde bağlayıcılar üretilmiştir. Ağırlıkça 9 farklı CMC oranına sahip bağlayıcılar 80mm×10mm×5mm boyutundaki kalıplara doldurularak yeterli katılma sağlayıcıya dek oda sıcaklığında bekletilmiştir. Hazırlanan yeşil parça numuneleri oda sıcaklığında 5 gün bekletildikten sonra SCHİMADZU AGS-X 10N-10kN model test cihazında 1 mm/dk hızda 3 nokta eğme testlerine tabi tutulmuş ve CMC konsantrasyonunun eğme dayanımı üzerindeki etkileri incelenmiştir. Bağlayıcı bünyesindeki CMC oranının %0'dan %10'a artmasına bağlı olarak eğme dayanımı 0.35 MPa'dan 5.1 MPa'a çıkarken süneklik ölçüsü olan yüzde birim uzama ise %15'den %1'e düşmektedir. %1,5 ve altındaki CMC konsantrasyonlarında yeşil parçanın oldukça sünek ancak düşük dayanıma sahip olduğu görülmektedir. CMC konsantrasyonunun artması eğme dayanımını ve elastik modülü artırarak bağlayıcının tutuculuğu üzerine olumlu bir etkiye yol açarken, aynı zamanda bağlayıcı sünekliğinin azalmasına, dolayısıyla daha kırılabilir yeşil parçaların meydana gelmesine neden olarak bağlayıcının baskı sonrası muhafazasını zorlaştırmaktadır. Bu sebepten ötürü hem yeterli esnekliği hem de yeterli dayanımı sağlayan %1.5-2.5 aralığı optimum CMC konsantrasyonu olarak belirlenmiştir.

Anahtar Kelimeler: Eklemeli imalat, Doğrudan Mürekkep Yazma, Üç nokta eğilme testi, Karboksimetil selüloz..

BIOMINERALIZATION CAPACITY DETERMINATION OF MUTANT *BACILLUS MEGATERIUM*

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Abstract

It is known that the traditional methods used to improve the deterioration of structures are mostly inadequate and cause different deterioration problems over time. Therefore, one of the most innovative methods used in recent years is biomineralization. Microbial calcite precipitation (MICP) is a biomineralization method that increases the durability of the structure and allows it to repair and improve according to the original microstructure. Urea hydrolysis by urease enzyme by urolytic bacteria is an important factor for calcification to obtain a higher concentration of precipitated carbonate. Within the scope of this research, studies were carried out with urolytic and non-pathogenic bacteria *Bacillus megaterium*. The bacteria were exposed to UV irradiation for 8 seconds, 11 seconds, 13 seconds, 15 seconds, 17 seconds, and 21 seconds, respectively, using an 8-watt ultraviolet fluorescent lamp in a 10x35x20 cm box. Christensen Urea Agar Base and Urease Activity Assay Kit (BioVision, K378-100) were used to compare the urease enzyme activations of the mutant bacteria with the urease enzyme activity of the original bacteria. In the study using Christensen Urea Agar Base, mutants and the original strain used as control were cultivated on urea agar for 24 h, 48 h. and 72 h. incubated throughout. At the end of the incubation period, the changes in the magenta color were photographed and the color intensities were measured. It was determined that the color intensities formed were higher in mutant bacteria than in the control and the intensity increased in direct proportion to the exposure time to UV radiation. In order to ensure the determined results, the enzyme activities of the *B. megaterium* bacterial strain and the mutant bacteria formed by 21 sec UV irradiation were tested by using the kit that measures the urease enzyme activity. The concentration of ammonia formation due to urease enzyme activity was measured as 1.01 nmol for *B. megaterium* and 3.32 nmol for mutant bacteria. When the amount of ammonia formed was examined, it was seen that there was a significant difference of 95% between the concentration averages and the mutant produced statistically more ammonia ($P<0.005$). At the end of the study, it was understood that the adaptation to high pH conditions of the bacteria exposed to UV radiation for 21 seconds increased and the urease enzyme activity increased. Accordingly, it was determined that the calcification potential and biomineralization capacity of the mutant bacteria increased compared to the original bacteria.

Keywords: *Bacillus megaterium*, Bio-mineralization, Mutation, UV radiation, MICP.

MECHANICAL CHARACTERIZATION OF THERMAL AND UV CURED GLASS COMPOSITES HAVING DIFFERENT LAY-UP CONFIGURATIONS

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Abstract

Glass composites are materials that combine the strength and toughness of glass with the flexibility and lightweight of a composite. In this study, it was investigated the mechanical and chemical properties of two types of glass composites: UV-cured and thermal-cured, with different layups. The UV-cured composites were prepared by mixing glass fibers with a UV-curable resin. The thermal-cured composites were prepared by mixing glass fibers with a thermoset resin. The composites were manufactured with two different layups: 0/90/0/90 and 0/+45/-45/90. Both types of composites were then subjected to a series of mechanical tests, including tensile, impact, and flexural tests. The results showed that the thermal-cured composites had slightly higher tensile strength and flexural strength than the thermal-cured composites. However, the thermal-cured composites had better impact resistance. Overall, the results of this study showed that UV-cured and thermal-cured glass composites have good mechanical properties. However, the UV-cured composites have slightly higher tensile strength and flexural strength, while the thermal-cured composites have better impact resistance and chemical resistance.

Keywords: *UV-Curing, Thermal Curing, Glass Composites, Mechanical Properties*

SYNTHESIS AND ANTIDIABETIC ACTIVITY OF HYDRAZONE DERIVATIVES

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Abstract

Diabetes mellitus, a chronic disease, is showing a rapid increase all over the world. 463 Million patients were identified in 2019, and this number is estimated to reach 578 million in 2030 and 700 million in 2045. Due to this rapid increase, new medicines are needed. In recent years, when the design of new effective drug candidates is examined, synthesis is generally made on the basis of drugs with known efficacy. Another way is to study the pharmacotherapeutic effects of a drug used to treat a disease with the idea that it can also be effective in other diseases. Based on this strategy, in this study, a new series of hydrazone compounds rich in biological activity was synthesized by selecting the acetohexamide compound, which is used as a first-generation antidiabetic drug, as a starting material. Hydrazone compounds have different pharmacological activities such as antimicrobial, antitubercular, anticonvulsant, analgesic, antiinflammatory, antiplatelet, anticancer, anti-viral, antitumor, and antimalarial activities. This study was started with acetohexamide to obtain hydrazone compounds. Hydrazones were synthesized from the reaction of ketones with hydrazides in acetonitrile using acetic acid as a catalyst. FT-IR, ¹H NMR, ¹³C NMR, and elemental analysis methods were used for the structural characterization of the synthesized hydrazone compounds. In addition, the properties of molecules such as H-bond acceptors, H-bond donors, TPSA, Lipinski, iLogP, GI absorption, and BBB permeability were also investigated with the SwissADME program used in drug design.

Keywords: Acetohexamide, Hydrazone, Antidiabetic activity.

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HİDRAZON TÜREVLERİNİN SENTEZİ VE ANTİDİYABETİK AKTİVİTESİ

Özet

Kronik bir hastalık olan diyabetes mellitus, tüm dünyada hızlı bir artış göstermektedir. 2019 yılında 463 milyon hasta tespit edilmiş olup, bu sayının 2030'da 578 milyonu ve 2045'de 700 milyonu bulması tahmin edilmektedir. Bu hızlı artıştan dolayı yeni ilaçlara ihtiyaç duyulmaktadır. Son yıllarda yeni etkili ilaç adaylarının tasarımı incelendiğinde genellikle etkinliği bilinen ilaçlar bazında sentez yapılmaktadır. Bir başka yol ise bir hastalığın tedavisinde kullanılan ilacın diğer hastalıklarda da etkili olabileceği fikriyle farmakoterapötik etkilerinin incelenmesidir. Bu stratejiden yola çıkılarak bu çalışmada, başlangıç materyali olarak birinci kuşak antidiyabetik ilaç olarak kullanılan asetoheksamid bileşiği seçilerek biyolojik aktivite açısından zengin yeni bir seri hidrazon bileşiği sentezlenmiştir. Hidrazon bileşiklerinin antimikrobiyal, antitüberküler, antikonvülsan, analjezik, anti-iltihabik, antiplatelet, antikanser, antiviral, antitümör ve antimalaryal etkinliklere sahip aktiviteleri vardır. Bu çalışmada hidrazon bileşiklerini elde etmek için asetoheksamitten yola çıkılmıştır. Hidrazonlar, katalizör olarak asetik asit kullanılarak asetonitril içinde ketonların hidrazitlerle reaksiyonundan sentezlendi. Sentezlenen hidrazon bileşiklerinin yapısal karakterizasyonu için FT-IR, ¹H NMR, ¹³C NMR ve elementel analiz yöntemleri kullanılmıştır. Ayrıca ilaç tasarımında kullanılan SwissADME programı ile H-bağı alıcıları, H-bağı vericileri, TPSA, Lipinski, iLogP, GI absorpsiyonu, BBB geçirgenliği gibi moleküllerin özellikleri de araştırılmıştır.

Anahtar Kelimeler: Asetoheksamit, Hidrazon, Antidiyabetik aktivite.

Teşekkür: Mali desteklerinden dolayı TÜBİTAK'a (Proje no: 121Z746) teşekkür ederiz.



PROS AND CONS OF NON-THERMAL TECHNIQUES IN FOOD PROCESSING AND PRESERVATION

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Abstract

Thermal treatment is one of the most widely used food preservation techniques in the methods of food processing from past to present in order to inhibit the activities of microorganisms that cause food spoilage and to give foods a suitable shelf-life. However, in traditional thermal applications, various undesirable losses occur in the nutritional components and sensory properties of different foods. On the other hand, consumers, who are more conscious now, demand foods with high nutritional content and sensory properties closest to natural and fresh ones. This situation has turned the attention of food professionals to the development of green, safe, eco-friendly, and effective non-thermal technologies, and various processing treatments have come to light over the past few decades. However, besides being well established in the scientific literature, research into non-thermal food processing technologies applied to a wide variety of food products is constantly increasing, and therefore, due to this remarkable progress, it is essential to synthesize the available information in a way that benefits of all actors. Moreover, in addition to the advantages of these developed techniques, some of them also have some disadvantages such as huge start-up costs, difficulties in implementation, and energy consumption. In this framework, in this study, firstly the operational mechanisms of food irradiation, pulsed electric field technique and cold plasma treatment, which are more emphasized among the non-thermal techniques and have proven adaptability to the industry and/or have high potential, were explained. Afterwards, the advantages and deficiencies of these treatments in terms of processing and preservation of various food products were discussed.

Keywords: *Non-thermal techniques, Food processing, Preservation.*

CYCLIC CODES OVER THE RING $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$

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Abstract

The processing, storing and transferring of information safely is of great importance in communication. Deformation in communication may occur when information is exposed to an external impact. The main purpose of coding theory is to transmit information as quickly as possible, in addition, to detect and correct the errors that occur on information. Using error correcting codes, efforts are made to compensate the deformities in communication. The higher the minimum weight of a code, the greater its capacity to detect and correct errors. Since linear codes are vector spaces, linear codes are easier to define and use rather than nonlinear codes. Since cyclic codes, belonging to the family of linear code, have an algebraically convenient structure, they are considered as a popular study subject by researchers. In recent years, codes over the Cartesian product rings have also become the focus of researchers' interest. In this study, firstly, the ring $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ is studied algebraically where p is an odd prime and $\nu^2 = \nu$ and linear codes over the ring $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ are defined and their properties are investigated. The Lee weight of an element in the ring $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ is defined and a weight preserving Gray map from the ring $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ to the field \mathbb{F}_p is given. Then, the properties of the duals of linear codes depending on the Euclidean inner product on the ring $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ are examined. Additionally, the generator polynomials for the cyclic codes and their duals over the ring $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ are searched and the number of codewords in a cyclic code and its dual code is formulated based on the generator polynomial of the cyclic code. Finally, using the Calderbank-Shor-Steane (CSS) construction method, it is shown that quantum error correcting codes can be obtained from the cyclic codes containing their dual.

Keywords: Finite rings, Cyclic codes, Dual codes, Generator polynomials, Quantum codes.

$\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ HALKASI ÜZERİNDEKİ DEVİRLİ KODLAR

Özet

Bilginin güvenli bir şekilde işlenmesi, saklanması ve transferi iletişimde büyük bir öneme sahiptir. Bilginin dıştan bir etkiye maruz kalmasıyla iletişimde bozulmalar meydana gelebilir. Kodlama teorisinin temel amacı bilgiyi mümkün olduğunca hızlı iletmekle birlikte bilgide oluşan hataları fark etmek ve düzeltmektir. Hata düzelten kodlar ile iletişimde bozukluklar telafi edilmeye çalışılmaktadır. Bir kodun minimum ağırlığı ne kadar büyükse hata farketme ve hata düzeltme kapasitesi de o kadar yüksektir. Lineer kodlar birer vektör uzayı oldukları için lineer kodların tanımlanması ve kullanılması lineer olmayan kodlara göre daha kolaydır. Lineer kod ailesine ait olan devirli kodlar cebirsel yönden elverişli bir yapıya sahip olduklarından araştırmacılar tarafından popüler bir çalışma konusu olarak göz önüne alınmaktadır. Son yıllarda kartezyen çarpım halkaları üzerindeki kodlar da araştırmacıların ilgi odağı haline gelmiştir. Bu çalışmada ilk olarak, p bir tek asal ve $\nu^2 = \nu$ olmak üzere $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ halkası cebirsel açıdan incelenmiş ve $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ halkası üzerindeki lineer kodlar tanımlanarak özellikleri araştırılmıştır. $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ halkasındaki bir elemanın sahip olduğu Lee ağırlık tanımlanmış ve $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ halkasından \mathbb{F}_p cismi üzerine ağırlık koruyan bir Gray dönüşüm verilmiştir. Daha sonra, $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ halkası üzerindeki Öklid iç çarpıma göre lineer kodların duallerinin özellikleri incelenmiştir. Aynı zamanda $\mathbb{F}_p \times (\mathbb{F}_p + \nu \mathbb{F}_p)$ halkası üzerindeki devirli kodlar ve devirli kodların dualleri için üreteç polinomları araştırılmış ve bir devirli koddaki ve bir devirli kodun dualindeki kod kelimesi sayısı devirli kodun üreteç polinomuna bağlı olarak formülize edilmiştir. Son olarak, Calderbank-Shor-Steane (CSS) inşa metodu ile dualini içeren devirli kodlardan kuantum hata düzelten kodların elde edilebildiği gösterilmiştir.

Anahtar Kelimeler: Sonlu halkalar, Devirli kodlar, Dual kodlar, Üreteç polinomları, Kuantum kodlar.

RESOLUTION IN READING ANALOG DATA: A LABVIEW APPLICATION

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Abstract

Sensors are electronic elements that produce analog signals according to the change of physical quantities such as temperature, pressure, stress, voltage, current, electric field and magnetic field. In experimental studies with sensors and automation products, the analog signal produced by the sensors must be converted to digital data. The electronic elements that perform this process are called Analog to Digital Converter (ADC). The most important feature used in ADC selection is digital data resolution. Digital data resolution can be defined as the smallest change value of the analog signal at the sensor output that causes a change in the digital output of the ADC. It is important that the analog signal received from the sensor is converted to a digital value as closely as possible to its real value. This situation can be improved by increasing the digital data resolution of the ADC. The high resolution of data reading not only increases the reliability of the experimental work, but also directly affects the decision mechanisms of automation products. The built-in ADCs found in most of the microcontrollers used for automation today are usually 10-bit resolution and can perform single channel operation at the same time. An external ADC element must be used to perform multi-channel and high-resolution conversion at the same time. In this direction, it is the aim of this study to develop a LabVIEW software to receive an analog signal at 8, 12 and 24 bit resolution via myRIO using external ADC elements. Within the scope of the study, first of all, the procedures of analog-digital conversion for each of the AD832 (8-Bit), MCP3201 (12-Bit) and AD7714 (24-Bit) ADC ICs are explained and then the LabVIEW software developed according to these procedures is discussed in detail.

Keywords: Analog Data, Resolution, LabVIEW.

ANALOG VERİ OKUMADA ÇÖZÜNÜRLÜK: BİR LABVIEW UYGULAMASI

Özet

Sensörler; sıcaklık, basınç, stres, voltaj, akım, elektrik alan ve manyetik alan gibi fiziksel niceliklerin değişimine göre analog sinyal üreten elektronik elemanlardır. Sensörlerle yapılan deneysel çalışmalarda ve otomasyon ürünlerinde sensörlerin ürettiği analog sinyalin dijital veriye dönüştürülmesi gerekir. Bu işlemi gerçekleştiren elektronik elemanlara Analog Dijital Dönüştürücü (ADC) denir. ADC seçiminde kullanılan en önemli özellik dijital veri çözünürlüğüdür. Dijital veri çözünürlüğü ADC nin dijital çıkışında değişikliğe sebep olan sensör çıkışındaki analog sinyalin en küçük değişim değeri olarak tanımlanabilir. Sensörden alınan analog sinyalin gerçek değerine en yakın şekilde dijital değere dönüştürülmesi önemlidir. Bu durum ADC nin dijital veri çözünürlüğünün yükseltilmesiyle iyileştirilir. Veri okuma çözünürlüğünün yüksek olması, deneysel çalışmanın güvenilirliğini artırdığı gibi otomasyon ürünlerinin karar mekanizmalarını da doğrudan etkilemektedir. Günümüzde otomasyon için kullanılan mikrokontrolcülerin bir çoğunda bulunan dahili ADC ler genellikle 10 bit çözünürlükte ve aynı anda tek kanal işlem yapabilmektedir. Aynı anda çok kanaldan ve yüksek çözünürlüklü dönüşüm yapabilmek için harici bir ADC elemanın kullanılması gerekmektedir. Bu doğrultuda bir analog sinyalin harici ADC elemanları kullanılarak myRIO üzerinden 8, 12 ve 24 bit çözünürlükte alınabilmesi için bir LabVIEW yazılımı geliştirmek bu çalışmanın amacı olmuştur. Çalışma kapsamında öncelikle AD832 (8-Bit), MCP3201(12-Bit) ve AD7714 (24-Bit) ADC entegrelerinin herbiri için analog dijital dönüşümün prosedürleri anlatılmış ve daha sonra bu prosedürlere göre geliştirilen LabVIEW yazılımı ayrıntılı olarak tartışılmıştır.

Anahtar Kelimeler: Analog Veri, Çözünürlük, LabVIEW.

THERMOCHROMIC DYE APPLICATION STUDY IN HOSIERY AND INVESTIGATION OF IT'S FASTNESS PROPERTIES

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Abstract

Today, finding a place for a product in the market can only be achieved by revealing its multi-functional, multi-needs and innovative aspects. Smart textiles are attracting more and more attention every day due to their high innovative design features, quality and multifunctionality. Due to chromic materials that change color, which is an important area of smart textiles, it is possible to obtain both textile products with enhanced aesthetic and visual properties and technological textile products. In the literature, there are some studies examining the color change of thermochromic dyes on textile products. The use of socks dyed with thermochromic dye as an immediate stimulus in high-risk foot complications, and the monitoring of fever in young children with socks containing leyko thermochromic microcapsules are examples of this field. For this purpose, heat sensitive thermochromic dye transfer printing technique, which has an activation temperature of 37°C and changes color from green to yellow with heat, was applied to thin socks knitted in matec. In addition, physical properties after application were examined by rubbing and washing fastness tests. When four different application groups were compared, it was understood that application group 3 was the most suitable group for use in thin socks in terms of both pattern color tone and production costs. It was observed that there were no difference between the groups in wet and dry rubbing fastnesses, whereas it was observed that it had high washing fastness up to 5 washings and moderate washing fastness up to 10 washings.

Keywords: Smart Textiles, Color Change, Patterning, Thermochromic Dye, Hosiery

İNCE ÇORAPLARDA TERMOKROMİK BOYA UYGULAMA ÇALIŞMASI VE HASLIKLARININ İNCELENMESİ

Özet

Günümüzde bir ürünün pazarda kendine yer bulabilmesi ancak onun çok fonksiyonlu, birden fazla ihtiyaca cevap veren ve yenilikçi yönlerinin ortaya çıkarılmasıyla sağlanabilmektedir. Akıllı tekstiller, yüksek yenilikçi tasarımsal özellikleri, kaliteleri ve çok fonksiyonlu olmaları nedeniyle her geçen gün daha fazla ilgi çekmektedirler. Akıllı tekstillerin önemli bir alanı olan renk değiştiren kromik materyaller sayesinde hem estetik ve görsel özellikleri zenginleştirilmiş tekstil ürünleri hem de teknolojik tekstil ürünleri elde etmek mümkündür. Literatürde termokromik boya ürünleri üzerinde renk değişimini inceleyen bazı araştırmalar mevcuttur. Termokromik boya ile boyanmış çorapların yüksek riskli ayak komplikasyonlarında ani uyaran olarak kullanılması, küçük çocukların ateşinin leyko termokromik mikrokapsül içeren çoraplar ile izlenmesi çalışmaları bu alana örneklerdir. Bu çalışmada kilotlu çocuk çoraplarının üzerinde bulunan desenlerin termokromik boya denemeleri sonucu renk değişiminin sağlanması amaçlanmıştır. Bu amaçla, matec ince çorap örme makinasında örülen çoraplara, 37°C aktivasyon sıcaklığına sahip olan ve ısı ile yeşilden sarıya doğru renk değiştiren ısıya duyarlı termokromik boya transfer baskı tekniği ile uygulanmıştır. Buna ilaveten uygulama sonrası haslık özellikleri, sürtme ve yıkama haslık testleriyle incelenmiştir. Dört farklı uygulama grubu karşılaştırıldığında gerek desen renk tonu, gerekse üretim maliyetleri açısından ince çoraplarda kullanımı en uygun olan grubun 3 no'lu uygulama grubu olduğu anlaşılmıştır. Gruplar arası yaş ve kuru sürtme haslıklarında fark bulunmadığı, 5 yıkamaya kadar yüksek, 10 yıkamaya kadar orta derecede yıkama haslığına sahip olduğu görülmüştür.

Anahtar Kelimeler: Akıllı Tekstiller, Renk Değişimi, Desenlendirme, Termokromik Boya, Çorap

DO INSTITUTIONAL DIFFERENCES AFFECT HEALTHCARE PROFESSIONALS ATTITUDES TOWARDS QUALITY STUDIES?

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Abstract

It is known that quality studies in health have an important place both in the world and in Turkey. Quality studies in becoming more important day by day and are being researched with increasing interest. It is thought that quality practices affect the performance and productivity of health workers positively, increase the satisfaction of patients and employees, and contribute positively to the performance and development of health institutions and organizations. This study was carried out in a descriptive and cross-sectional design in order to determine the attitudes of health professionals working in different health institutions towards quality practices. The population of the research consisted of health workers working in three hospitals (a university, a public and a private hospital) (N:3978). Power analysis was used to calculate the sample. It was aimed to reach at least 357 healthcare professionals with a 5% margin of error and 95% confidence interval. Using the proportional stratified sampling method, 357 healthcare workers were stratified by institution. The sample of the study was 681 participants who accepted to be included in the study and filled out the data collection tools completely. 17% of the universe has been reached. The data of the study were collected face-to-face by being distributed to the relevant hospitals between 1 May and 30 June 2023, using the "Descriptive Information Form" and "Attitude Scale towards Quality Studies: Healthcare Professionals Version". The data of the study were collected face-to-face by being distributed to the relevant hospitals between 1 May and 30 June 2023, using the Introductory Information Form and the Attitude Scale towards Quality Studies: Healthcare Professionals Version developed by the researchers. Descriptive statistics were applied by transferring the data to the SPSS 22.0 package program. Ethics committee approval was obtained from the Non-Interventional Clinical Research Ethics Committee, institutional permission from the hospitals where the study would be conducted, and voluntary consent of the participants. Most of the health workers participating in the research were in a university hospital (40.8%), female (67.1%), 26-35 years old (43.8%), single (54.9%), professional nurse-midwife (60.1%), associate degree (43.6%), the number of years working in the profession and institution was 5 years and ↓ (46.1%) (58.9%). In addition, it was determined that most of the participants were in shifts (61.4%), were assigned to special units (36.7%), and chose their profession voluntarily (64.3%). The mean score of the scale was 3.61±0.81; The mean scores of the corporate, managerial and employee approach sub-dimensions were (3.57±0.85), (3.56±0.86), (3.88±0.89), respectively. With the scale, it was determined that there were significant differences with the variables of institution, gender, profession, working year in the profession and the institution, the unit of work and choosing the profession willingly (p<0.05). It was determined that the attitude of health professionals working in university, private and public hospitals towards quality studies were at a high level. However, it was determined that the quality attitude of the employees in private and public hospitals was higher than those of the employees in the university hospital.

Keywords: *Quality Practices, Quality in Health, Health Workers, Attitude.*

KURUM FARKLILIKLARI SAĞLIK ÇALIŞANLARININ KALİTE ÇALIŞMALARINA YÖNELİK TUTUMLARINI ETKİLER Mİ?

Özet

Sağlıkta kalite çalışmalarının hem dünyada hem de Türkiye’de önemli bir yere sahip olduğu bilinmektedir. Her geçen gün kalite çalışmaları daha da önemli hale gelmekte ve artan bir ilgiyle araştırılmaktadır. Kalite uygulamaları, sağlık çalışanlarının performansını ve verimliliğini olumlu etkilediği, hastaların ve çalışanların memnuniyetini artırdığı, sağlık kurum ve kuruluşlarının performansının ve gelişiminin yükseltilmesine olumlu katkı sağladığı düşünülmektedir. Bu çalışmada farklı sağlık kurumlarında görev yapan sağlık çalışanlarının kalite çalışmalarına yönelik tutumlarını belirlemek amacıyla tanımlayıcı ve kesitsel bir desende gerçekleştirildi. Araştırmanın evrenini üç hastanede (bir üniversitesi, bir kamu, bir özel hastane) görev yapan sağlık çalışanları oluşturdu (N:3978). Örneklemenin hesaplanmasında güç analizi yapıldı. %5 hata payı, %95 güven aralığı ile en az 357 sağlık çalışanına ulaşılması hedeflendi. Oransal tabakalı örnekleme yöntemi ile 357 sağlık çalışanı kurumlarına göre tabakalandı. Araştırmaya dahil olmayı kabullenen ve veri toplama araçları eksiksiz dolduran 681 katılımcı ise araştırmanın örneklemini oluşturdu. Evrenin %17’sine ulaşıldı. Araştırmanın verileri, “Tanıtıcı Bilgi Formu” ve “Kalite Çalışmalarına Yönelik Tutum Ölçeği:Sağlık Çalışanları Sürümü” kullanılarak 1 Mayıs-30 Haziran 2023 tarihleri arasında, ilgili hastanelere dağıtılarak yüz yüze toplandı. Veriler, SPSS 22,0 paket programına aktararak tanımlayıcı istatistikler uygulandı. Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu’ndan etik kurul izni, araştırmanın gerçekleştirileceği hastanelerden kurum izni ve katılımcıların da gönüllü onamları alındı. Araştırmaya katılan sağlık çalışanlarının çoğu üniversite hastanesinde (%40.8), kadın (%67.1), 26-35 yaş aralığında (%43.8), bekar (%54.9), mesleği hemşire-ebe ((%60.1), önlisans eğitime sahip (%43.6), meslekte ve kurumda çalışma yılı 5 yıl ve ↓ (%46,1)(%58,9) olduğu belirlendi. Ayrıca katılımcıların çoğu vardiyalı olarak (%61,4), özellikli birimlerde görevlendirildikleri (%36,7), kendi istekleriyle mesleklerini seçtikleri (%64,3) saptandı. Ölçeğin puan ortalaması $3,61 \pm 0,81$ olup; kurumsal, yönetici ve çalışan yaklaşımı alt boyut puan ortalamaları sırasıyla $(3,57 \pm 0,85)$, $(3,56 \pm 0,86)$, $(3,88 \pm 0,89)$ olarak tespit edildi. Ölçek ile kurum, cinsiyet, meslek, meslekte ve kurumda çalışma yılı, çalışılan birim ve mesleği isteyerek seçme değişkenleri ile anlamlı farklılıklar olduğu belirlendi ($p < 0,05$). Üniversite, özel ve kamu hastanelerinde çalışan sağlık profesyonellerinin kalite çalışmalarına ilişkin tutumu yüksek düzeyde olduğu belirlendi. Ancak özel ve kamu hastanesinde çalışanların kalite tutumu, üniversite hastanesinde çalışanlardan yüksek olduğu tespit edildi.

Anahtar Kelimeler: Kalite Uygulamaları, Sağlıkta Kalite, Sağlık Çalışanları, Tutum.

ELECHTROCHEMOTHERAPY IN VETERINARY MEDICINE

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Abstract

In recent years, the number of pets, especially cats and dogs, has been rapidly increasing in our country. As a result of domestication, the lifespan of pets has significantly increased compared to previous centuries, both worldwide and in our country. This situation not only strengthens the bond between pet owners and their animals but also brings along many problems. One of these problems, and perhaps the most important one, is the occurrence of tumors in these animals.

Tumors are formations that can proliferate uncontrollably in the body, can be benign or malignant, and are generally characterized by swelling in the tissues, hence the name. They can also spread from one tissue to another, posing a threat to the life of the organism. Histopathological examination is necessary to determine the nature of tumors, and taking a biopsy is the first step in treatment.

Based on the histopathological examination of the tumor, some of the treatment methods that can be applied include complete surgical excision of the tumor, chemotherapy, cryotherapy, which are widely mentioned in the literature and commonly used methods. However, when surgical excision is not possible due to the location or size of the tumor, or when the patient's owner does not accept other treatment options, another method that can be safely applied is electrochemotherapy.

Electrochemotherapy is based on the principle of providing the ability to enter the tumor cell and exhibit its cytotoxic effect by creating temporary gaps in the tumor cell wall through short and intense electrical currents applied to the tissues. Although these chemotherapeutic agents have very high cytotoxic properties under normal conditions, they cannot pass through the cell wall or have very limited ability to do so.

Keywords: *Cat, Dog, Electrochemotherapy*

RESPONSE OF SOIL ORGANIC CARBON MINERALIZATION TO LEAVES OF *CERATONIA SILIQUA* L. AND *PINUS BRUTIA* TEN. UNDER LABORATORY CONDITION

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Abstract

Ceratonia siliqua L. (Carob tree) and *Pinus brutia* Ten. (Turkish red pine) are two of the dominant trees of the Mediterranean plant vegetation. In the forest systems, heterotrophic microorganisms in the soil decompose the organic compounds to obtain energy for growth that was originated by the fall of leaves and litter, dead roots and root exudates. Even though these trees had economic importance, their role in the carbon dioxide release from the soil is not well understood in the soil ecosystems. In order to understand the effects of leaves of Turkish red pine and carob tree, which are naturally grown in Cukurova University Campus, Adana, Turkey, on soil organic carbon mineralization, leaves were added their soils at 0.5% and 1%, humidified at 80% of field capacity and incubated for 52 days at 28°C. Addition of leaves of both plants significantly enhanced cumulative carbon mineralization ($P<0.05$). Leaves of Turkish red Pine in both doses were separately and significantly higher than carob tree in the rate of carbon mineralization ($P<0.05$). Effects of plant species, dose of leaves and their combinations on mineralization were significant ($P<0.05$). It's possible to conclude that soil organic carbon mineralization is a good indicator for the evaluation of the effects of environmental changes to the microorganisms in the soil ecosystems. Both the leaves of carob tree and Turkish red pine are easily available energy sources for soil microorganisms in all doses while carob leaf is a better option for carbon sequestration than Turkish red pine leaf.

Keywords: Soil microbial respiration, Microbial activity, Leaf substrates, Priming effect.

LABORATUVAR KOŞULLARINDA *CERATONIA SILIQUA* L. VE *PINUS BRUTIA* TEN. YAPRAKLARININ TOPRAK ORGANİK KARBON MİNERALİZASYONUNA ETKİSİ

Özet

Ceratonia siliqua L. (Keçiboynuzu) ve *Pinus brutia* Ten. (Kızılçam) Akdeniz Bölgesi'ne özgü bitki vejetasyonuna hakim olan ağaçlardan ikisini oluşturmaktadır. Orman ekosistemlerinde, topraktaki heterotrofik mikroorganizmalar büyümeleri için gerekli olan enerjiyi, düşen yapraklar, ölü kökler ve kök salgılarından oluşan organik bileşikler parçalayarak elde etmektedirler. Her ne kadar bu ağaçların ekonomik önemi oldukları bilinse de, toprak ekosistemlerinde topraktan karbondioksit salınımında olan roller iyi bilinmemektedir. Adana, Türkiye'de Çukurova Üniversitesi Kampüsü'nde doğal olarak yetişen kızılçam ve keçiboynuzu yapraklarının toprak karbon mineralizasyonuna olan etkilerinin anlaşılabilmesi için bu bitkilerin yaprakları %0.5 ve %1 oranında kendi topraklarına karıştırıldıktan sonra tarla kapasitelerinin %80'i oranında nemlendirilmiş ve 28°C'de 52 gün boyunca inkübe edilmişlerdir. Her iki bitkinin yapraklarının ilavesi kümülatif karbon mineralizasyonunu önemli bir biçimde arttırmıştır ($P<0.05$). Karbon mineralizasyon oranında kızılçam yaprak dozlarının ayrı ayrı keçiboynuzu yaprak dozlarından önemli bir biçimde yüksek olduğu saptanmıştır ($P<0.05$). Bitki türlerinin, yaprak dozlarının ve bunların kombinasyonlarının mineralizasyona etkilerinin önemli olduğu belirlenmiştir ($P<0.05$). Sonuçta, toprak organik karbon mineralizasyonu toprak ekosistemlerinde çevresel değişimlerin mikroorganizmalara olan etkilerinin değerlendirilmesinde iyi bir indikatör olduğu söylenebilir. Hem kızılçam hem de keçiboynuzu yapraklarının bütün dozlarının toprak mikroorganizmaları için kolay erişilebilen enerji kaynakları olduğu belirlenmiş olup keçiboynuzu yaprağının karbon bağlanması konusunda kızılçam yaprağına göre daha iyi bir seçenek olduğu ortaya çıkmıştır.

Anahtar Kelimeler: Toprak mikrobiyal respirasyonu, Mikrobiyal Aktivite, Yaprak substratları, Teşvik etkisi.

PARTIAL SPLENIC EMBOLIZATION FOR HYPERSPLENISM AFTER LIVER TRANSPLANTATION

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Abstract

Partial splenic embolization (PSE) has proven to be a successful alternative to splenectomy for patients experiencing hypersplenism. Unlike splenectomy, which carries a higher risk of perioperative complications in these cases, PSE offers a less invasive approach to treating cytopenia caused by hypersplenism in liver transplant recipients. Between October 2013 and October 2021, 14 partial SAE procedures performed in 12 liver transplant recipients for hypersplenism were retrospectively analysed. Patients underwent selective arterial catheterization and embolization via a percutaneous femoral approach. Embolization procedures performed with n-butyl-2-cyanoacrylate+iodized oil (n=7) microspheres (n=3), coils (n=2), coil and n-butyl-2-cyanoacrylate+iodized oil (n=1), coil and microspheres (n=1). Indications for PSE were thrombocytopenia in two cases and a combination of thrombocytopenia and leukopenia in 12 cases, totaling 14 procedures. The technical success rate was 100% in all procedures. The average volume embolized was 52.8 % (50-70%). The lower pole being selectively embolized in 13 procedures and the upper pole in one procedure. Despite the embolization in 2 of 12 patients, there was no expected increase in platelet and white blood cell (WBC) levels. Further examinations revealed that one patient had aplastic anemia, while the other had EBV-related immune thrombocytopenia. The expected increase in platelet and WBC counts was detected in the first 4 weeks period in all of the remaining 10 patients (mean platelet counts improved from 48 K/ μ L to 104 K/ μ L and mean WBC counts improved from 1.7 K/ μ L to 5.7 K/ μ L). After detecting a decline in platelet and WBC counts during follow-up, one patient underwent a repeated embolization at the 12th month, and the other at the 18th month. This resulted in permanent improvement for one patient. However, the other patient although the platelet counts improved after the second embolization unfortunately passed away at the 12th month due to rejection. Post-embolization symptoms included fever in two patients and abdominal pain in three patients. In conclusion Using partial splenic embolization proves to be a secure and efficient therapeutic choice for addressing hypersplenism in individuals who have undergone liver transplantation.

Keywords: Transplantation, splenic embolization, endovascular

A NOVEL RECTANGULAR NOZZLE DESIGN AND MOTION CONTROL TO INCREASE THE SPEED OF YOGURT FILLING MACHINES

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Abstract

This paper presents a novel yogurt filling machine design with a rectangular-shaped nozzle. The unique rectangular nozzle design enables efficient residue separation by rotation for fast and effective cleaning between batches. The elongated shape of the nozzle enhances filling speed by covering a larger surface area. This machine moves buckets of yogurt along a conveyor belt in sync with the movement of the nozzle. As the empty bucket approaches the nozzle, it is placed under the nozzle for filling. The nozzle is then lowered to a predetermined height inside the bucket and the filling process begins.

The unique motion style of the nozzle plays an important role in optimizing the filling process. First, filling the bucket while moving significantly reduces the overall filling time compared to filling while stationary. Second, starting the filling process at a higher altitude minimizes the formation of air bubbles within the yogurt. This upward motion ensures a more even filling and longer shelf life for yogurt products. Additionally, the rectangular-shaped nozzle tip rotates around its center during the filling process, promoting a more even distribution of the yogurt within the bucket. When the bucket's radius is similar to the nozzle tip's width, the rotation around the center is sufficient. However, in cases where the bucket's radius greatly exceeds the nozzle tip's width, an additional circular orbiting motion is introduced. This combined rotation and orbiting mechanism reduces the possibility of air bubbles and improves product quality and shelf life.

By implementing this innovative design, the proposed yogurt filling machine offers significant advantages in terms of speed, uniformity, and product quality. Efficient separation of residues, fast filling processes, and reduced air bubble formation contribute to faster and more reliable production lines, ultimately leading to longer shelf life of yogurt products.

Keywords: Yogurt, Filling Machine, Nozzle Design, Motion Control, Automation, Multiple Axes.

MACHINE LEARNING IN DIABETES CLASSIFICATION: DATA ANALYSIS WITH EXTRA TREES CLASSIFIER

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Abstract

Diabetes is a disease that affects millions of people worldwide and significantly impairs their quality of life. Early diagnosis and effective management are of critical importance to improve health outcomes for patients. This study aims to develop and evaluate a machine learning model for diabetes classification, which can be a valuable tool for early diagnosis and risk assessment. The study utilized a dataset containing more than 100 patient records. These records encompass various demographic and health information, such as age, gender, body mass index, blood pressure, fasting blood sugar, hemoglobin A1c, family history of diabetes, smoking habits, diet, and exercise habits. During the data preprocessing stage, missing and duplicate values were checked, and categorical values were encoded. Additionally, the correlation of the data was examined, and class distribution was inspected. The imbalanced class distribution was corrected using the Synthetic Minority Over-sampling Technique (SMOTE). This technique rectifies imbalanced class distribution by synthetically augmenting samples of the minority class. Various classification models were compared, and the Extra Trees Classifier model was selected. This model works by combining multiple decision trees, resulting in high accuracy rates. The model was evaluated using various metrics. The results demonstrated that the Extra Trees Classifier is an effective model for diabetes classification. This study showcases the potential of machine learning in medical diagnosis and risk assessment and can serve as a foundation for future research. It can be a significant step in the early diagnosis and management of diabetes, thereby improving patients' quality of life and enhancing the effectiveness of healthcare services.

Keywords: Diabetes Classification, Machine Learning, Data Preprocessing, Health Information Systems, Data Analysis, Risk Assessment

DİYABET SINIFLANDIRMASINDA MAKİNE ÖĞRENMESİ: EXTRA TREES CLASSİFİER İLE VERİ ANALİZİ

Özet

Diyabet, dünya çapında milyonlarca insanı etkileyen ve yaşam kalitesini önemli ölçüde düşüren bir hastalıktır. Erken teşhis ve etkili yönetim, hastaların sağlık sonuçlarını iyileştirmek için kritik öneme sahiptir. Bu çalışma, diyabet sınıflandırması için bir makine öğrenmesi modeli oluşturmayı ve değerlendirmeyi hedeflemektedir, bu da erken teşhis ve risk değerlendirmesinde önemli bir araç olabilmektedir. Çalışmada, 100'den fazla hasta kaydını içeren bir veri seti kullanılmıştır. Bu kayıtlar, hastaların yaş, cinsiyet, vücut kitle indeksi, kan basıncı, açlık kan şekeri, hemoglobin A1c, diyabet aile öyküsü, sigara kullanımı, diyet ve egzersiz alışkanlıkları gibi çeşitli demografik ve sağlık bilgilerini içermektedir. Veri ön işleme aşamasında, eksik ve yinelenen değerler kontrol edilmiş ve kategorik değerler kodlanmıştır. Ayrıca, verinin korelasyonu incelenmiş ve sınıf dağılımı kontrol edilmiştir. Dengesiz sınıf dağılımı, Synthetic Minority Over-sampling Technique (SMOTE) kullanılarak düzeltilmiştir. Bu teknik, azınlık sınıfının örneklerini sentetik olarak artırarak dengesiz sınıf dağılımını düzeltir. Çeşitli sınıflandırma modelleri karşılaştırılmış ve Extra Trees Classifier modeli seçilmiştir. Bu model, birçok karar ağacını birleştirerek çalışır ve bu sayede yüksek doğruluk oranları elde eder. Model, çeşitli metrikler kullanılarak değerlendirilmiştir. Sonuçlar, Extra Trees Classifier'ın diyabet sınıflandırması için etkili bir model olduğunu göstermiştir. Bu çalışma, makine öğrenmesinin tıbbi teşhis ve risk değerlendirmesindeki potansiyelini göstermektedir ve gelecekteki araştırmalar için bir temel oluşturabilmektedir. Bu, diyabetin erken teşhisinde ve yönetiminde önemli bir adım olabilir, böylece hastaların yaşam kalitesini iyileştirebilir ve sağlık hizmetlerinin etkinliğini artırabilir.

Anahtar Kelimeler: Diyabet Sınıflandırması, Makine Öğrenmesi, Veri Ön İşleme, Sağlık Bilgi Sistemleri, Veri Analizi, Risk Değerlendirmesi.

NOVEL CHIRAL THIOUREAS DERIVED FROM BENZYL ISOTHIOCYANATE: DESIGN, SYNTHESIS, CHARACTERIZATION AND EVALUATION OF ACHE AND BCHE INHIBITION ACTIVITIES

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Abstract

The identification of new, potent, selective, and less toxic agents is one of the most pressing health problems. In order to find a solution to this situation, scientists, especially those engaged in organic synthesis, synthesize new active substances.

Current studies conducted in our group include the synthesis, structure determination, and activity studies of organic molecules that can be an alternative to drugs that can be used in the treatment of Alzheimer's with in silico molecular modeling and will also shed light on studies conducted in this field.

In this study, chiral thiourea derivatives have been synthesized, which will shed light on substances that may be medicines. For the structure determination of the components obtained safely, FT-IR, ¹H and ¹³C NMR, mass spectroscopy, and elemental analysis were used. And also their biological activities of synthesized compounds have been screened as enzyme inhibition activities.

Keywords: Chiral thiourea, Alzheimer, AChE inhibition

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BLOCKCHAIN BASED VEHICLE REGISTRATION SYSTEM

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Abstract

Nowadays, Blockchain technology is used in many different fields for various purposes. Data can be stored securely with distributed ledger and smart contracts, which are the advantages of this technology. Reliable and unchangeable storage of vehicle registration information is important for the reliability of vehicle trade. Motor vehicles are the most widely used vehicles to meet transportation needs. Motor vehicles contribute to all levels of logistics, from individual transportation to the product supply chain. This has resulted in a significant expansion of the motor vehicle trade. However, the growth of trade brings forth various challenges. The most significant issue among these problems is gaining a financial advantage by concealing information about vehicles, such as accidents, registration, and expertise. Although car expert centers are used for this situation, even these documents can be forged. Particularly corporate companies involved in buying and selling vehicles can share all the past information and documents about the vehicles they sell through a reliable source, thereby increasing buyer satisfaction. This study includes the development of a Blockchain-based vehicle registration system and portal as a solution to address this requirement. The proposed system will ensure immutability by storing the information of the vehicles as well as the supplementary documents (expertise, inspection, etc.) on the blockchain. In addition, with the portal to be included in the system, different companies and individuals will have the ability to register their vehicles and access the vehicles shared by other companies. The proposed study will prevent financial losses that may occur in vehicle trade, thanks to the reliability of all information of the vehicles in the system. Moreover, in case of a situation that may occur after the sale of the vehicle, immutable registration information can be used as evidence.

Keywords: Blockchain, Vehicle registration, Vehicle trade

BLOK ZİNCİR TEMELLİ ARAÇ SİCİL SİSTEMİ

Özet

Günümüzde Blok zincir teknolojisi birçok farklı alanda, çeşitli amaçlara yönelik kullanılmaktadır. Bu teknolojinin sunduğu avantajlardan olan dağıtık defter ve akıllı sözleşmeler ile veriler güvenli bir şekilde saklanabilmektedir. Araçlara ait sicil bilgilerinin güvenilir ve değiştirilemez şekilde saklanması, araç ticaretinin güvenilirliği açısından önem arz etmektedir. Ulaşım ihtiyaçlarının giderilmesi için en çok kullanılan vasıtalar motorlu araçlardır. Motorlu taşıtlar, bireysel taşımacılıktan ürün tedarik zincirine kadar lojistiğin tüm seviyelerine katkıda bulunur. Bu durum motorlu taşıt ticaretinin önemli ölçüde genişlemesine neden olmuştur. Ancak ticaretin büyümesi çeşitli zorlukları da beraberinde getirmektedir. Bu sorunlar arasında en önemli konu araçlara ait kaza, ruhsat, ekspertiz gibi bilgilerin gizleyerek maddi avantaj elde edilmesidir. Her ne kadar bu duruma yönelik otomobil test merkezleri kullanılsa da bu belgelerde dahi sahtecilik yapılabilmektedir. Özellikle araç alım satımı yapan kurumsal firmalar, sattıkları araçlarla ilgili geçmişe dönük tüm bilgi ve belgeleri güvenilir bir kaynak üzerinden paylaşarak alıcı memnuniyetini artırabilmektedir. Bu çalışma, bu ihtiyacı karşılamak için bir çözüm olarak blok zincir tabanlı bir araç kayıt sistemi ve portalının geliştirilmesini içermektedir. Önerilen sistem, araçlara ait bilgilerin yanı sıra tamamlayıcı belgeleri de (ekspertiz, muayene vb.) blok zinciri üzerinde saklanarak değiştirilemezliği garanti altına alacaktır. Ayrıca sisteme dahil edilecek bir portal ile farklı firma ve şahıslar kendi araçlarını kaydedebilecek ve diğer firmalar tarafından paylaşılan araçlara erişim sağlayabileceklerdir. Önerilen çalışma, sistem içerisinde yer alan araçların tüm bilgilerinin güvenilir olması sayesinde araç ticaretinde meydana gelebilecek maddi kayıpların önüne geçecektir. Ayrıca araç satış sonrası yaşanabilecek bir durum karşısında, kanıt niteliğinde değiştirilemez sicil bilgileri kullanılabilecektir.

Anahtar Kelimeler: Blok zincir, Taşıt sicil, Taşıt ticareti

CUSTOMIZABLE HARDWARE COMMUNICATION PROTOCOL FOR INDUSTRIAL AUTOMATIONS

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Abstract

With the increasing population, the demands of people are growing exponentially. Factories are required to produce more to meet these needs. However, given the demands and the limitations of manual labor, it is not feasible to achieve sufficient production solely through manpower. This challenge is addressed by the implementation of automation in production processes. Nonetheless, ensuring smooth communication among these automated systems and enabling them to work in harmony within the business processes remains an ongoing area of research and development. With the rapid pace of technological advancements and digitalization, it is expected that the number of automated processes in factories will increase significantly, leading to the emergence of new communication protocols. This study proposes the development of a customizable platform for facilitating communication among industrial automations. By developing an Open Platform Communication (OPC) server, it will become feasible to transfer real-time data obtained from automation systems. Moreover, the platform will be designed to support various data communication protocols such as Modbus, Profibus, and MQTT. Many large-scale companies that rely on industrial automation for their manufacturing operations also utilize enterprise resource planning applications such as SAP and Oracle to carry out their business processes. The developed OPC server is responsible for processing real-time data and transmitting it to the client or other automation systems. Companies using this system may need to access historical data, so real-time information will also be saved. Therefore, the services will be designed to transfer the collected real-time data to third-party applications. With the developed customizable hardware communication protocol system, it will allow the production to be carried out more smoothly and quickly.

Keywords: Open platform communication, Communication protocol, Production processes, Industrial automations

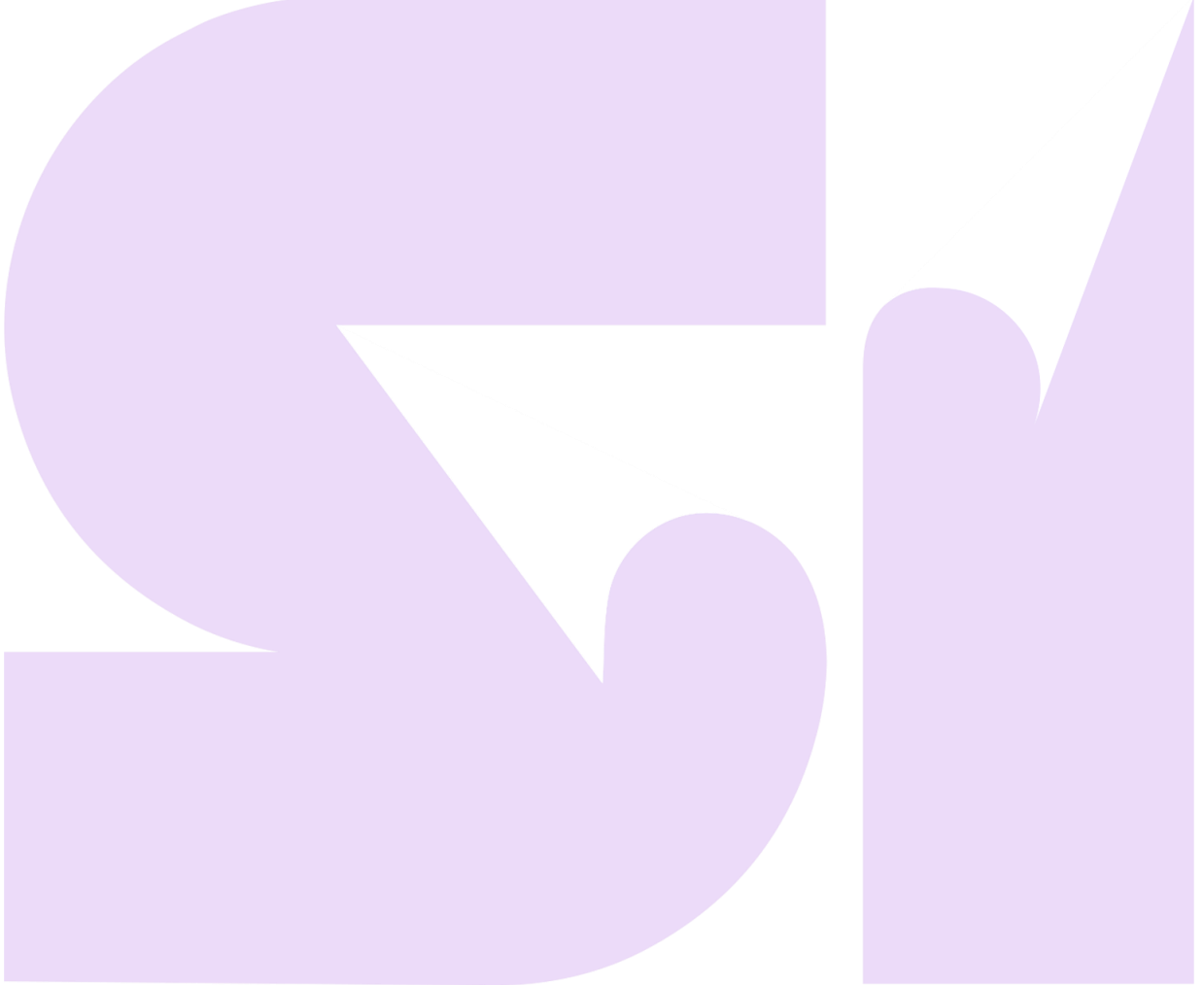
ENDÜSTRİYEL OTOMASYONLAR İÇİN ÖZELLEŞTİRİLEBİLİR DONANIM İLETİŞİM PROTOKOLÜ

Özet

Artan nüfusla birlikte insanların talepleri de katlanarak artmaktadır. Bu ihtiyaçları karşılamak için fabrikaların daha fazla üretim yapması gerekmektedir. Ancak, talepleri ve el emeğinin sınırlamaları göz önüne alındığında, yeterli üretimi yalnızca insan gücü ile elde etmek mümkün değildir. Bu zorluk, üretim süreçlerinde otomasyonun uygulanmasıyla giderilir. Bununla birlikte, bu otomatik sistemler arasında sorunsuz bir iletişimin sağlanması ve iş süreçlerinde uyumlu bir şekilde çalışabilmesi, halen devam eden bir araştırma ve geliştirme alanıdır. Teknolojik gelişmelerin ve dijitalleşmenin hızlı artması ile birlikte fabrikalardaki otomatik süreçlerin sayısının önemli ölçüde artması ve yeni iletişim protokollerinin ortaya çıkması beklenmektedir. Bu çalışmada, endüstriyel otomasyonlar arasındaki iletişimi kolaylaştırmak için özelleştirilebilir bir platformun geliştirilmesini önermektedir. Açık İletişim Platform (OPC) sunucusu geliştirilerek otomasyon sistemlerinden elde edilen gerçek zamanlı verilerin aktarılması mümkün hale gelecektir. Ayrıca platform, Modbus, Profibus ve MQTT gibi çeşitli veri iletişim protokollerini destekleyecek şekilde tasarlanacaktır. Üretim operasyonları için endüstriyel otomasyona güvenen birçok büyük ölçekli şirket, iş süreçlerini yürütmek için SAP ve Oracle gibi kurumsal kaynak planlama uygulamalarını da kullanır. Geliştirilen OPC sunucusu, gerçek zamanlı verilerin işlenmesinden ve

istemciye veya diğer otomasyon sistemlerine iletilmesinden sorumludur. Bu sistemi kullanan şirketlerin geçmiş verilere erişmesi gerekebilir, bu nedenle gerçek zamanlı bilgiler ayrıca kaydedilecektir. Bu nedenle hizmetler, toplanan gerçek zamanlı verileri üçüncü taraf uygulamalara aktarmak için tasarlanacaktır. Geliştirilen özelleştirilebilir donanım iletişim protokol sistemi ile üretimin daha sorunsuz ve hızlı bir şekilde gerçekleştirilmesine olanak sağlayacaktır.

Anahtar Kelimeler: Açık iletişim platformu, İletişim protokolü, Üretim süreçleri, Endüstriyel otomasyonlar



ROLE OF MAGNETIC RESONANCE IMAGING IN THE PROGNOSIS OF INTERVERTEBRAL DISC DISEASES

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Abstract

Intervertebral disc disease (IVDD) is a term used in veterinary medicine to encompass neurological diseases that affect the intervertebral discs. Lesions developed based on different types of IVDD have been discovered and examined with advancements in diagnostic technologies. A classification system has been defined for IVDD, including Intervertebral Disc Extrusion (Hansen type 1), Intervertebral Disc Protrusion (Hansen type 2), Hydranucleus Pulposus Extrusion, Acute Non-Compressive Nucleus Pulposus Extrusion, Fibrocartilaginous Embolic Myelopathy, and Intradural/Intramedullary IVDD. Intervertebral disc disease leads to various clinical presentations depending on the affected segment and the type of lesion observed in the patient. Clinical findings typically manifest acutely and can range from the presence of pain to paralysis where deep pain sensation is lost. Among the types of IVDD, extruded disc disease (IVDE) is the most common cause of compressive spinal cord injury in dogs. Given the risks and costs associated with the procedures required for diagnosis and treatment, as well as the potential for permanent damage due to the nature of the disease, it is crucial for the prognosis to be determined by the veterinarian and shared with the pet owner. The selection and success of medical and surgical treatment techniques used in these pathologies are known to be determined by evaluating the patient's clinical condition, the severity of the trauma, various parameters measured from cerebrospinal fluid, and data obtained through advanced imaging techniques. With this presentation, we aimed to emphasize that magnetic resonance imaging is considered the gold standard for both the diagnosis and prognosis determination of the disease, as it assists us in determining the prognosis through examination and diagnostic techniques.

Keywords: *Dog, Intervertebral Disc Disease, Prognosis, Magnetic Resonance Imaging.*