OMÜ TEKNOLOJİ TRANSFER OFİSİ

1. INTERNATIONAL TECHNOLOGY TRANSFER SYMPOSIUM

6-8 MAY 2024

SYMPOSIUM ABSTRACT BOOKLET

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ABOUT US

Technology transfer consists of the following successive processes: following the technological developments in the world, knowledge, skills, machinery, selecting technologies such as products, services, etc., importing the selected technologies into the country, adapting the imported technologies to national conditions and needs and starting production, developing and disseminating the technology. Therefore, technology transfer involves understanding, adapting, developing, and diffusing acquired technologies. The mission of Technology Transfer Offices is to ensure the qualified follow-up and comprehensive provision of these processes.

The "International Technology Transfer Symposium," which will be held hybrid for the first time in our country by Ondokuz Mayıs University Technology Transfer Office on 6-8 May 2024 (you can make your presentation on any day you wish), is a symposium where researchers, academics, industry professionals, experts and students from different countries will share their experiences and research results, discuss the challenges and solutions that can be produced.

The symposium aims to present technological innovations in all fields, from basic sciences to engineering, veterinary medicine, health, and social sciences worldwide, and even facilitate their commercialization processes. The symposium, where research, experimental studies, prototypes, products, and patents will be transferred and promoted globally, will not only be limited to academic papers but will also include panels with the participation of sector and public representatives to discuss and debate the main issues that form the basis of Technology Transfer, and a workshop area where companies can present their products, patent holders can present their patents, and entrepreneurs waiting for investment can present their prototypes.

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Assoc. Prof. Dr. Onur SARAÇOĞLU	*Tokat Gaziosmanpaşa University*
Assoc. Prof. Dr. Ömer Faruk KARATAŞ	*Erzurum Technical University*

Assoc. Prof. Dr. Ömer KASAR	*Artvin Çoruh University*
Assoc. Prof. Dr. Önder TOR	*Kastamonu University*
Assoc. Prof. Dr. Özgür BAYTUT	*Ondokuz Mayıs University*
Assoc. Prof. Dr. Özgür ÖZDİLLİ	*Hitit University*
Assoc. Prof. Dr. Rıza BAYRAK	*Sinop University*
Assoc. Prof. Dr. Sedat DOĞAN	*Ondokuz Mayıs University*
Assoc. Prof. Dr. Dr. Selami BALCI	*Karamanoğlu Mehmetbey University*
Assoc. Prof. Dr. Serap KARAGÖL	*Ondokuz Mayıs University*
Assoc. Prof. Dr. Serhat ERAT	*Gebze Technical University*
Assoc. Prof. Dr. Şahane Funda ARSLANOĞLU	*Ondokuz Mayıs University*
Assoc. Prof. Dr. Timuçin Emre TABARU	*Sivas University of Science and Technology*
Assoc. Prof. Dr. Tuba KARABEY	*Tokat Gaziosmanpaşa University*
Assoc. Prof. Dr. Tuğra KARADEMİR COŞKUN	*Sinop University*
Assoc. Prof. Dr. Ufuk KIRBAŞ	*Ondokuz Mayıs University*
Assoc. Prof. Dr. Veysel TURAN	*Bingöl University*
Assist. Prof. Dr. Ali Osman ADIGÜZEL	*Ondokuz Mayıs University*
Assist. Prof. Dr. Ahmet Cevahir ÇINAR	*Konya Selçuk University*
Assist. Prof. Dr. Alev ERENLER	*Sinop University*
Assist. Prof. Dr. Ali ÖZCAN	*Karamanoğlu Mehmetbey University*
Assist. Prof. Dr. Arda BÜYÜKSUNGUR	*Ankara University*
Assist. Prof. Dr. Arife ŞİMŞEK	*Tokat Gaziosmanpaşa University*
Assist. Prof. Dr. Ayşenur KELEŞ DAYAUÇ	*Hitit University*
Assist. Prof. Dr. Begüm KORUNUR ENGİZ	*Ondokuz Mayıs University*

Assist. Prof. Dr. Berkan ZÖHRA	*Amasya University*
Assist. Prof. Dr. Betül KAFKASLIOĞLU YILDIZ	*Sivas University of Science and Technology*
Assist. Prof. Dr. Burak TEKİN	*Ondokuz Mayıs University*
Assist. Prof. Dr. Canan ORAL	*Amasya University*
Assist. Prof. Dr. Canan ÜLGEN	*Şırnak University*
Assist. Prof. Dr. Cemil OCAK	*Gazi University*
Assist. Prof. Dr. Cemile SOLAK FIŞKIN	*Ordu University*
Assist. Prof. Dr. Cengiz Görkem DENGİZ	*Ondokuz Mayıs University*
Assist. Prof. Dr. Ceren ORAK	*Sivas University of Science and Technology*
Assist. Prof. Dr. Çağatay KANDEMİR	*Ordu University*
Assist. Prof. Dr. Durmuş Özkan ŞAHİN	*Ondokuz Mayıs University*
Assist. Prof. Dr. Edip TAŞKESEN	*Şırnak University*
Assist. Prof. Dr. Emre BİRİNCİ	*Kastamonu University*
Assist. Prof. Dr. Emre ŞAHİN	*Bingöl University*
Assist. Prof. Dr. Emre YURTKURAN	*Sivas University of Science and Technology*
Assist. Prof. Dr. Emrehan YAVŞAN	*Tekirdağ Namık Kemal University*
Assist. Prof. Dr. Engin Ufuk ERGÜL	*Amasya University*
Assist. Prof. Dr. Erdem ÖZYURT	*Eskişehir Technical University*
Assist. Prof. Dr. Erhan BERGİL	*Amasya University*
Assist. Prof. Dr. Erhan KIRTEPE	*Şırnak University*
Assist. Prof. Dr. Erman ZURNACI	*Kastamonu University*
Assist. Prof. Dr. Ertuğrul KARAKULAK	*Tekirdağ Namık Kemal University*
Assist. Prof. Dr. Esengül ERDEM	*Şırnak University*

Assist. Prof. Dr. Fatih ARLI	*Şırnak University*
Assist. Prof. Dr. Fatih ÇALIŞKAN	*Ondokuz Mayıs University*
Assist. Prof. Dr. Fevzi ŞEVİK	*Bingöl University*
Assist. Prof. Dr. Gamze Nur MÜJDECİ	*Hitit University*
Assist. Prof. Dr. Gazal CENGİZ	*Şırnak University*
Assist. Prof. Dr. Gökhan KAYHAN	*Ondokuz Mayıs University*
Assist. Prof. Dr. Hakan DUMRUL	*Şırnak University*
Assist. Prof. Dr. Halit BAKIR	*Sivas University of Science and Technology*
Assist. Prof. Dr. Hülya AYKAÇ ÖZEN	*Ondokuz Mayıs University*
Assist. Prof. Dr. Hüseyin GÜRBÜZ	*Şırnak University*
Assist. Prof. Dr. Hüseyin ŞAHİNER	*Sinop University*
Assist. Prof. Dr. İbrahim Behram UĞUR	*Şırnak University*
Assist. Prof. Dr. İdris SANCAKTAR	*Ondokuz Mayıs University*
Assist. Prof. Dr. İsmail İŞERİ	*Ondokuz Mayıs University*
Assist. Prof. Dr. Kadir AKSU	*Ordu University*
Assist. Prof. Dr. Kağan SÖĞÜT	*Kilis 7 Aralık University*
Assist. Prof. Dr. Kholoud ELMABRUK	*Sivas University of Science and Technology*
Assist. Prof. Dr. Mehmet Ali CANBOLAT	*Karamanoğlu Mehmetbey University*
Assist. Prof. Dr. Mehmet CİHAN	*Ordu University*
Assist. Prof. Dr. Mehmet GÜL	*Şırnak University*
Assist. Prof. Dr. Mehmet Onurhan GÜCÜŞ	*Karamanoğlu Mehmetbey University*
Assist. Prof. Dr. Mehmet Recai DURGUT	*Tekirdağ Namık Kemal University*
Assist. Prof. Dr. Mehmet Samet ERDEM	*Sinop University*

Assist. Prof. Dr. Mehmet TÜTÜNCÜ	*Ondokuz Mayıs University*
Assist. Prof. Dr. Memduha ERGÜT	*Sivas University of Science and Technology*
Assist. Prof. Dr. Mert Şafak TUNALIOĞLU	*Hitit University*
Assist. Prof. Dr. Murat KILIÇ	*Eskişehir Technical University*
Assist. Prof. Dr. Mustafa AMAR	*Ordu University*
Assist. Prof. Dr. Mustafa COŞAR	*Hitit University*
Assist. Prof. Dr. Mustafa Kemal BALKİ	*Sinop University*
Assist. Prof. Dr. Mustafa RÜSTEMOĞLU	*Şırnak University*
Assist. Prof. Dr. Muzaffer ÖZGÜLEŞ	*Alanya University*
Assist. Prof. Dr. Nazmiye Tibel TUNA	*Ondokuz Mayıs University*
Assist. Prof. Dr. Nihan SİDAR	*Alanya University*
Assist. Prof. Dr. Nuray TURAN	*Karamanoğlu Mehmetbey University*
Assist. Prof. Dr. Nurhan GÜNEŞ	*Sivas University of Science and Technology*
Assist. Prof. Dr. Onur YONTAR	*Ondokuz Mayıs University*
Assist. Prof. Dr. Orkun KANTARCI	*Şırnak University*
Assist. Prof. Dr. Ömer ELKIRAN	*Sinop University*
Assist. Prof. Dr. Özge ÖZ YILDIRIM	*Ondokuz Mayıs University*
Assist. Prof. Dr. Ramazan GÜN	*Bingöl University*
Assist. Prof. Dr. Rasım ÇEKİK	*Şırnak University*
Assist. Prof. Dr. Refik ÖZYURT	*Ordu University*
Assist. Prof. Dr. Remzi FIŞKIN	*Ordu University*
Assist. Prof. Dr. Reşat SAKUR	*Şırnak University*
Assist. Prof. Dr. Rezan BAKIR	*Sivas University of Science and Technology*

Assist. Prof. Dr. Sadiye KANTARCI	*Şırnak University*
Assist. Prof. Dr. Selim Aras	*Ondokuz Mayıs University*
Assist. Prof. Dr. Serdar YAMAN	*Şırnak University*
Assist. Prof. Dr. Sertaç Samed SEYİTOĞLU	*Hitit University*
Assist. Prof. Dr. Sevgi ERNAS	*Ankara University*
Assist. Prof. Dr. Sinem ÇEVİK	*Ondokuz Mayıs University*
Assist. Prof. Dr. Soner ŞEN	*Konya Selçuk University*
Assist. Prof. Dr. Tolga Acar YEŞİL	*Sinop University*
Assist. Prof. Dr. Tuğba ŞAŞMAZ KURU	*Ondokuz Mayıs University*
Assist. Prof. Dr. Tuğrul YUMAK	*Sinop University*
Assist. Prof. Dr. Veysel SÜZERER	*Bingöl University*
Assist. Prof. Dr. Yeşim SÜRMELİOĞLU	*Sinop University*
Assist. Prof. Dr. Yunus Onur YILDIZ	*Sinop University*
Assist. Prof. Dr. Yusuf DOĞAN	*Sivas University of Science and Technology*
Assist. Prof. Dr. Yusuf Osman DONAR	*Ankara University*
Res. Assist. Dr. İsmail ÇETİN	*Ondokuz Mayıs University*
Res. Assist. Dr. Mehmet KURU	*Ondokuz Mayıs University*
Res. Assist. Dr. Tugay ÜLKÜ	*Tokat Gaziosmanpaşa University*
Lecturer Dr. A. Kübra YONTAR	*Ondokuz Mayıs University*
Lecturer Dr. Abdulkadir ŞAHİNER	*Yıldız Technical University*
Lecturer Dr. Ahmet KARAOĞLU	*Sinop University*
Lecturer Dr. Ahmet GÜLAY	*Trabzon University*
Lecturer Dr. Engin BAYRA	*Sinop University*

Lecturer Dr. Figen TAŞCI DURGUT	*Tekirdağ Namık Kemal University*
Lecturer Dr. Mustafa SEYREK	*Hitit University*
Lecturer Dr. Recep AYKAN	*Sinop University*
Lecturer Dr. Reşit SÖKMEN	*Şırnak University*
Lecturer Dr. Salih DAĞLI	*Sinop University*
Lecturer Dr. Selma NACAK	*Hitit University*
Lecturer Dr. Şeyhmus AKSOY	*Sinop University*
Dr. Eray ÖNLER	*Tekirdağ Namık Kemal University*
Dr. Ersen OKUR	*Tekirdağ Namık Kemal University*
Dr. Pınar TAĞRİKULU	*Ondokuz Mayıs University*
Dr. Tayfun ÖZTÜRK	*Artvin Çoruh University*

• Themes and Topics

▸ Conference Topics

This topic list is not exhaustive but provides guidance on the scope and types of research that fit the conference.

- The role of stakeholders, such as Technology Transfer Offices, Intermediaries, Incubators, Research Institutes, Technology Transfer Institutes, The Academic Firm, Government Labs, etc.
- Dynamics of (eco)systems, be it innovation ecosystems, entrepreneurial ecosystems, technology transfer ecosystems, or other related constructs such as networks and clusters, etc.
- Topics on the technology transfer and public policy nexus, such as public entrepreneurship, the entrepreneurial government, the role of institutions, evaluation of technology transfer, its performance, or its qualitative/quantitative metrics, the socio-economic impact of science commercialization, (re)evaluations of legal frameworks, etc.
- Phenomena and concepts that relate to the commercialization process of scientific results, such as university spin-offs, intellectual property management and technology licensing, invention disclosures, opportunity recognition, venture creation, etc.

- Interactions, such as university-government collaborations, university-industry collaborations, strategic alliances, public-private partnerships for research, innovation, and entrepreneurship, etc.
- Geographical boundaries of technology transfer or academic entrepreneurship, either national, regional, or international, covering the digital, physical, or hybrid forms that impact technology transfer, etc.
- Social and societal aspects related to technology transfer activities, such as social, sustainable, inclusive practices, the role of immigration and diversity in technology transfer practices, etc.
- The role of digitalization in technology transfer and academic entrepreneurship, the role of digital technologies (generative AI, IoT, quantum computing, ...) in the commercialization process, and the mobility or diffusion of technologies and academic knowledge.
- Underlying dynamics that drive technology transfer activities, such as competition vs. cooperation, formal and informal knowledge flows, tangible or intangible exchanges, (trans/national) learning and education, career development, costs vs. benefits of technology transfer, etc.
- The strategic choices related to knowledge and technology transfer, connecting to innovation management, knowledge management, strategic management, etc.

Guided by this list, you can choose your theme below and send your paper.

Engineering

- Computer Engineering
- Electrical and Electronics Engineering
- Mechatronics Engineering
- Industrial Engineering
- Environmental Engineering
- Food Engineering
- Geomatics Engineering
- Civil Engineering
- Chemical Engineering

- Mechanical Engineering
- Metallurgy and Materials Engineering
- Agriculture Engineering
- Architecture
- Other

Fundamental Sciences

- Physics
- Chemistry
- Biology
- Mathematics
- Molecular Biology and Genetics
- Statistics
- Other

Health

- Medicine
- Dentistry
- Pharmacy
- Health Sciences
- Veterinary Medicine
- Other

Other Sciences

- Educational Sciences

- Social Sciences and Humanities
- Economics and Administrative Sciences
- Communication
- Sports Sciences
- Tourism
- Foreign Languages
- Other

• Symposium Program

6 MAY 2024 - MONDAY

REGISTRATION 08:30/09:30

OPENING SPEECHES 09:30/10:35

Rector Opening Speech 09:30/09:45
Prof. Dr. Yavuz ÜNAL - Rector of Ondokuz Mayıs University

PROTOCOL SPEECHES 09:45/10:35

Halit DOĞAN – Mayor of Samsun Metropolitan Municipality 09:45/09:55
Orhan TAVLI – Governor of Samsun 09:55/10:05
Prof. Dr. Hasan MANDAL – President of TÜBİTAK 10:05/10:35

OPENING PRESENTATIONS 10:35/11:20

"The Phenomenon of Technology Transfer; Yesterday, Today, Tomorrow" – 10:35/10:50

Keynote Speaker: Özlem SEVİNÇ TİGİN - Eskişehir Technical University Technology Transfer Office Intellectual Property and Commercialization Coordinator / President of the Association of Technology Transfer Professionals

"Artificial Intelligence in Health" - 10:50/11:20

Keynote Speaker: Huzeyfe YILMAZ – Vice Minister of Health

PLAQUE CEREMONY - 11:20 / 11:30

OPENING PANEL 11:30/13:00
INTERNATIONAL TECHNOLOGY TRANSFER PANEL

Moderator: Prof. Dr. Mustafa Said KURŞUNOĞLU
(OMU Head of International Relations Unit)

Panelist 1: Prof. Datuk Ts. Dr. Ahmad Fauzi Ismail
Rector of Unversity of Technology Malaysia
"UTM Best Practices of International Technology Transfer"

Panelist 2: Prof. Dr. Arif SATRIA
Rector of IPB University, Indonesia
"Optimizing the Role of Universities through a Techno-sociopreneurial Ecosystem"

Panelist 3: Dr. Makhmudov Muhammadismoil MUKHITDINOVICH
Rector of Alfraganus University, Uzbekistan
"Digital Era Entrepreneurship: Smart Systems Business"

LUNCH – 13:00/14:30

PANEL II - 14:30/16:00
INTELLECTUAL INDUSTRIAL AND COMMERCIAL PROPERTY RIGHTS and UNIVERSITY-INDUSTRY COOPERATION PANEL

Moderator: Murat BAYBALI
Director of TÜBİTAK Technology Transfer Office

Panelist 1: Salih BEKTAŞ
TÜRK PATENT Head of Designs Department

Panelist 2: Esra CER YARDIMOĞLU
(ÜBİTAK TEMEG Group Coordinator

Panelist 3: Prof. Dr. Tarık BAYKARA
Doğuş University - Research Center Director

"Doğuş University: New Opportunities and Instructions in The University-Industry Relationship Within An Organized Industrial Zone"

BREAK - 16:00/16:15

PANEL III - 16:15/17:45
TECHNOLOGY TRANSFER IN THE LEADING COMPANIES

Moderator: Prof. Dr. Yavuz ÜNAL
Rector of Ondokuz Mayıs University

Panelist 1: Yavuz EKİNCİ
General Manager of MİLKAB (Milli Kablo) Savunma

Panelist 2: Nejat İNANIR
Managing Consultant of Önder Savunma - (Retd.) Real Admiral

Panelist 3: H. Zafer ARAL
Chairman of the Board of Samsun Yurt Savunma

7 MAY 2024 - TUESDAY

PRESENTATIONS - I. Session - 09:00/10:30

BLUE HALL (OMÜ UZEM BUILDING FLOOR-2)

THEME: TECHNOLOGY TRANSFER PHENOMENON - 1

Moderator: Lecturer Rabia Akçatemiz

SPEAKER	SUBTOPIC
DENİZ EKMEKÇİOĞLU	Discussion Of Innovation Approach In The Framework Of Industrial Design Through Intellectual Property
SÜLEYMAN TURGUT	Technology Transfer Experiences And Future Challenges In Augmented Humans Technologies
ECEM ALAN KEVSEROĞLU, DENİZ EKMEKÇİOĞLU	Patent Portfolio Analysis In Ondokuz Mayis University Between 2018-2023
M. CEM SAKARYA, NURAY ATSAN, C. ECE ÖNER AYBEK, İ.VELİ SEZGİN	**(Online)** A Research On Companies Producing Tourism Technologies In Technoparks In Tr61 Region
TRAINING HALL (OMÜ UZEM GROUND FLOOR)	
THEME: DIGITALIZATION IN PUBLIC	
Moderator: Assist. Prof. Dr. Samet ERDEM	

SPEAKER	SUBTOPIC
SELDA DEMİRDEN	Evaluation Of Renewable Energy Strategies Within The Framework Of Development Plans In Turkey
FATİH KAAN BOZER	Ethical Issues That May Arise From The Use Of Artificial Intelligence Technology In Public Services
FATMA BETÜL DEMİR	Ethics And Public Issues In The Context Of The Use Of Virtual Reality Technology In Public Services
RABİA ASYA AKÇAAY	The Impact Of Information Technologies On Public Services In Turkey: The Example Of E-Government
DENİZ YAĞIZ	The Implementation Of E-Democracy In Turkey Within The Framework Of The Relationship Between Politics And Technology
ORANGE HALL (OMÜ UZEM BUILDING FLOOR-2)	
THEME: TECHNOLOGY TRANSFER PHENOMENON - 2	
Moderator: Assoc. Prof. Dr. Mevlüt GÜRBÜZ	

SPEAKER	SUBTOPIC
TRI PRARTONO, ERKA BUDIARTI LACONI, YUNI PUJI HASTUTI, DWI GUNTORO, MOHAMMAD HENDRA WIBOWO	Management And Commercialization Of Intellectual Property: Best Practice In Stp's Ipb University

MEHMET KOKOÇ, AYŞEGÜL ASLAN, AHMET GÜLAY, FURKAN KALYONCU, SEVİLAY ARSLAN	A Research On University Students' Perception Of R&D Activities And Entrepreneurship
SUNA ÖZAY	The Impact Of Technological Developments In The Turkish Defense Industry On Turkish Foreign Policy
SEVİM ALIŞIR, CENGİZ GÖRKEM DENGİZ, İSMAİL CAN, TUĞBA MUTUK	A Software For Measuring The Achievement Of Educational Program Outcomes And Evaluating Faculty Performance In Universities
CATALINA MIHAELA VOAIDES, NARCISA ELENA BABEANU, ANA CORNELIA BUTCARU, GINA FINTINERU	**(Online)** Ctt-Usamv Agrobiolife – Catalyst For The Innovation Ecosystem

BROWN HALL (OMÜ UZEM BUILDING FLOOR-2)
THEME: TECHNOLOGY TRANSFER PHENOMENON - 3
Moderator: Özlem SEVİNÇ TİGİN

SPEAKER	SUBTOPIC
MEHMET EMRE, SÜLEYMAN TURGUT	Analysis Of The 2021 Calls Of The Tubitak 1702 Patent-Based Technology Transfer Support Program
DENİZ ŞENYAY ÖNCEL, PINAR ÖZTABAN	Procurement Method For Contracts Signed Between Patent Agent Firms And Technology Transfer Offices Within The Universities
EZGİ PALAS DAĞLI, GAMZE TUNA	Evaluation Of Technology Transfer Offices From The Perspective Of Administrative Law
AYŞE ASİLTÜRK	(online) TECHNOLOGY TRANSFER SYSTEMS IN THE WORLD AND TÜRKİYE
WHITE HALL (OMÜ UZEM BUILDING FLOOR-3)	
THEME: TECHNOLOGY TRANSFER PHENOMENON - 4	
Moderator: Lecturer Arzu FIRLARER	

SPEAKER	SUBTOPIC
MEHMET KOKOÇ, AYŞEGÜL ASLAN, AHMET GÜLAY, FURKAN KALYONCU, SEVİLAY ARSLAN	Exploring University Students' Metaphorical Understanding Of Technology Transfer: A Qualitative Study

SELÇUK CANTÜRK, NEVİN ÖZER	Valuation Of Early Stage Incubation Startups And Measuring Their Commercialization Potential
BATUHAN BİLİCİ, BAHATTİN GÖKHAN TOPAL	**(Online)** Public, University And Industry Cooperation In Turkey: The Role Of Technology Transfer Offices Within The Framework Of Development Policies
M. CEM SAKARYA, NURAY ATSAN, C. ECE ÖNER AYBEK, İ.VELİ SEZGİN	**(Online)** A Review Of R&D And Design Center Companies In Tr61 Region

BREAK - 10:30/11:00

PRESENTATIONS - II. Session - 11:00/12:30

BLUE HALL (OMÜ UZEM BUILDING FLOOR-2)

THEME: TECHNOLOGY INTEGRATION IN EDUCATION - 1

Moderator: Assoc. Prof. Dr. Polat ŞENDURUR

SPEAKER	SUBTOPIC
KERİM CÜCE, ALİ EREN BAYRI, DURU NEHİR ENGÜR, EYMEN ŞENOL	Perceptions Of Gifted Students Towards Chatbots: Knowledge Levels And Usage Experiences
SEZEN KURU, ŞENER ŞENTÜRK, FADIL ŞİRAZ	Examination Of Digital Addiction Levels Of Associate Degree Students
UĞUR BAŞTAN, SEVİM ŞEVVAL TUNÇ, MERT TURAN	Digital Violence Perception Of Young People Aged 18-25 (Samsun Sample)
MEHMET SELİM YILDIRIM	**(Online)** The Effect Of Web 2.0-Supported Learning Environments On Primary School Students' Technology Perceptions

TRAINING HALL (OMÜ UZEM GROUND FLOOR)

THEME: TECHNOLOGY INTEGRATION IN EDUCATION - 2

Moderator: Prof. Dr. Ayşenur BÜYÜKGÖZE KAVAS

SPEAKER	SUBTOPIC
MEHTAP KARALAR, AYŞENUR BÜYÜKGÖZE KAVAS	Testing The Effectiveness Of An Online Decision-Making Skills Program Supporting The Career Development Of Middle School Students

KERİM CÜCE, MUSTAFA ÖZTURAN, YASİN EMİR YILMAZ, HAMZA TURAL	Bilsem Students' Opinions On The Use Of 360° Virtual Tours In Social Studies
ADEM ÜNLÜ, YUSUF ÇAĞAN CEYLAN, KUTLUHAN DANAYİYEN	A Research On Entrepreneurship Characteristics Of Special Talented Students: Atakum Bilsem Case
PINAR TAĞRİKULU, ELİF OMCA ÇOBANOĞLU	Use Of Technology In Outdoor Education: Away From Sockets, Outside The Classroom, Inside Education

ORANGE HALL (OMÜ UZEM BUILDING FLOOR-2)
THEME: TECHNOLOGY INTEGRATION IN EDUCATION - 3
Moderator: Assoc. Prof. Dr. Hatice Gökçe BİLGİÇ DOĞAN

SPEAKER	SUBTOPIC
FERHAT ARSLAN, BARTU TOMRUKÇU, KEREM BEKDEMİR	The Contribution Of Digital Stories To Listening Education In Turkish Lesson
ADEM APAYDIN, KAYA ÖZELP, ŞENER ŞENTÜRK	Investigation Of Educators' Attitudes And Literacy Levels Towards Artificial Intelligence
İSMAİL ÇETİN	Innovative Methods For Technology Transfer In Education: The Role Of Chatgpt
ADNAN YASİN ASOĞLU, ZEYNEP BAŞTAN, ÖYKÜ BAŞAR, MUSTAFA MERT METE	The Effect Of Artificial Intelligence Supported Personalised Learning Systems On The Achievement Of Gifted Students

BROWN HALL (OMÜ UZEM BUILDING FLOOR-2)
THEME: DIGITALIZATION IN HEALTH
Moderator: Lecturer Sema GÜL

SPEAKER	SUBTOPIC
MURAT TERZİ, SEMA GÜL, KÜBRA ASLAN KOCA, HARUN SÜMBÜL	Design And Implementation Of An Iot Based Mobile Eeg Device Using Esp8266 Microcontroller
AHMET TURAN, DUAA WARILLE	Automatic Detection Of Posture And Movement Positions Of Patients At Risk Of Falling

SEMA GÜL, KÜBRA ASLAN KOCA, MURAT TERZİ	Mutlusun Multiple Sclerosis Patient Tracking Application
SEMA GÜL, KÜBRA ASLAN KOCA, MURAT TERZİ	Aims Database: Artificial Intelligence Supported Multiple Sclerosis Database

WHITE HALL (OMÜ UZEM BUILDING FLOOR-3)
THEME: INFORMATION COMMUNICATION TECHNOLOGIES
Moderator: Assist. Prof. Dr. İsmail İŞERİ

SPEAKER	SUBTOPIC
EMRE CAN YILMAZ, RECAİ OKTAŞ	Pull Request Based Automatic Defect Dataset Generation Tool
MUH YUZRIL IHZA BAHARUDDIN, AIGERIM YERIMBETOVA, ACHMAD RIZAL, MUHAMMAD HABLUL BARRI	Application Of Pressure Scanning System On Bicycle Saddle Based On Iot To Prevent Cramps On Beginners Cyclist
HARUN SÜMBÜL, AHMET BÖĞREK	Developing An IoT System Capable Of Analyzing Road Conditions And Driver Performance Using Esp8266
HAKAN ÇAĞLAR, YUNUS EMRE KEPENEK	Smart Personal Assistant For Choosing A University
İSMAİL İŞERİ	Artificial Intelligence-Supported Cv And Job Ad Matching: A Good Practice On Jobsocial

PRESENTATION – (OMÜ AKM MAIN HALL) 11:00/11:30

“Technology and Acceptance Models with Reference to the Patient Technology Acceptance Model”

Keynote Speaker: Prof. Dr. Malcolm CLARKE - Telehealth Expert

PRESENTATION – (OMÜ AKM MAIN HALL) 11:30/12:00

“Management of Science and TechnoPark: Lesson Learnt from IBP University”

Keynote Speaker: Prof. Dr. Erika Budiarti Lakoni – Indonesia IPB University, Head of Institute of Science and Technopark

PRESENTATION – (OMÜ AKM MAIN HALL) 12:00/12:30

"The Role of Technopark – Technology Transfer Offices in University-Industry Cooperation"

Keynote Speaker: Serdar ÇALIŞ – İstanbul Technical University ARI Teknokent / TTO General Coordinator

LUNCH – 12:30/14:00

PANEL IV - 14:00/15:00
The Importance of Technology Transfer in Technoparks

Moderator: Assoc. Prof. Dr. Mevlüt GÜRBÜZ
General Manager of Samsun TECHNOPARK

Panelist 1: Prof. Dr. Attila DİKBAŞ
General Manager of İTÜ ARI TEKNOKENT

Panelist 2: Prof. Dr. Mehmet HAMURCU
Chairman of the Board of Konya TEKNOKENT

Panelist 3: Dr. Ferkan ÇELİK
IQ Partners Technology Education and R&D Consulting Chairman of the Board

BREAK - 15:00/15:15

PRESENTATION - (OMÜ AKM MAIN HALL) - 15:15/15:45

"ERASMUS+: Funding for Student Exchange or One4All?"

Keynote Speaker: Dr. Ranâ KASAPOĞLU ÖNDER (President of Communications Department of Turkish National Agency)

PRESENTATION – (OMÜ AKM MAIN HALL) - 15:45/16:15

"Paradigm Break Example; "TEKNOFEST Model"

Keynote Speaker: Elvan KUZUCU HIDIR – Turkish Technology Team Foundation Chairperson of the Board of Directors

PRESENTATION (ONLINE) - 16:15/16:45

"ÜSİMP's Contribution to the Development of Our National Ecosystem Through International Relations"

Keynote Speaker: Prof. Dr. Fazilet VARDAR SUKAN - Sabancı University SUNUM Director and Vice President of ÜSİMP Executive Board

PRESENTATION (ONLINE) - 16:45/17:15

"Turcorn from Local to Global Silicon Valley Model"

Keynote Speaker: Timur ARSLANOĞLU – General Manager of Starcamp Global - San Francisco

GALA DINNER / AWARDS CEREMONY 19:00/22:00

8 MAY 2024 - WEDNESDAY

PRESENTATIONS - I. Session - 09:00/10:30

BLUE HALL (OMÜ UZEM BUILDING FLOOR-2)

THEME: INFORMATION COMMUNICATION TECHNOLOGIES

Moderator: Lecturer Eda BEYLİHAN

SPEAKER	SUBTOPIC
AYŞE BEGÜM TOPYILDIZ, RECAİ OKTAŞ	Open Source Linear Programming Libraries And Their Use In Agricultural Optimization
AKHMAD FAQIH, IMAM WAHYU AMANULLAH, FADHLIL RIZKI MUHAMMAD	Horticultural And Plantation Cultivation Information Systems Based On Weather And Climate Predictions: University-Industry Collaboration
GÜLCAN AKPINAR, AYŞE BEGÜM TOPYILDIZ	An Example Of Integrated And Sustainable Quality Assurance System Digitalisation In Higher Education: Omu Unikys
ISMIRIDA SHALA	**(Online)** The Future Of Digital Art: The Problem Of Plagiarism And Ethical Debates In Artificial Intelligence Supported Designs

BROWN HALL (OMÜ UZEM BUILDING FLOOR-2)

THEME: INFORMATION COMMUNICATION TECHNOLOGIES

Moderator: Lecturer Dr. Oğuz Emre KURAL

SPEAKER	SUBTOPIC
YAVUZ ÜNAL, FATMA EKİNCİ	Digitalization Of Hadith Sources And An Example Of Hadith Database As An Online Reference Source
FATİH SAĞLAM	Development Of An R Package For Estimation Of Rare Values In Imbalanced Regression Data Sets

MEHMET APAYDIN	**(Online)** Computer Aided Analysis In The Detection Of Hadiths
ONUR DERSE	**(Online)** Developing Logistics Trend: The Physical Internet

ORANGE HALL (OMÜ UZEM BUILDING FLOOR-2)	
THEME: SMART SYSTEMS/ENGINEERING	
Moderator: Prof. Dr. Kemal YILDIZLI	
SPEAKER	**SUBTOPIC**
HARUN SÜMBÜL, ABDURRAHMAN TUNÇER, KENAN YILDIRIM	Developing An Artificial Intelligence Feeding System To Feed Street Animal
BERKAN EMRE İNCE, SONER TOKÇALAR, YASİN KARAN, SERDAR DİZMAN	Centrifuge-Based Water Content Determination System Design For Green Tea
UĞUR KIRÇIL, CENGİZ TEPE, TAMER CAN KURT	Intelligent Heater Head Control For Diesel Fuel Filters
LÜTFÜ NAMLI, FEVZİ ŞAHİN, BİROL ELEVLİ, TAMER CAN KURT	Development Of Novel Heater Plates For Diesel Fuel Filters With Smart Heaters
RIDVAN KUDU, LÜTFÜ NAMLI	Experimental Investigation Of The Usability Of Existing Internal Combustion Engines With Hydrogen Fuel
DAMLA TOPAL, AHMET YASİR SAVCI, İDRİS SANCAKTAR	Flight Control Computer Design And Manufacturing For Model Rockets

WHITE HALL (OMÜ UZEM BUILDING FLOOR-3)	
THEME: SMART SYSTEMS/ENGINEERING	
Moderator: Assoc. Prof. Dr. Serap KARAGÖL	
SPEAKER	**SUBTOPIC**
HASAN İLTERİŞ DİNCER, TAHA KARAOĞLU, SELİN CEREN YAMAK, EKREM ALTAN, İDRİS SANCAKTAR	Raspberry Pi And Artificial Intelligence Based Automatic Faulty Product Detection: An Industrial Solution Proposal
HALİL BURAK ÇIRAY, SELİM ARAS	Optimized Signal Processing For Predicting Impact Locations

SELİM ARAS, HÜSEYİN AYAR	Development Of A Digital Signal Generator For Piezoelectric Transducers
ÖZGÜR ÖNDER, YASİN KARAN	Detection Of Tea And Fern With Yolo Algorithms
ÖMER FARUK YILMAZ, İDRİS SANCAKTAR	Comparative Analysis Of Global Road Planning Algorithms
HÜSEYİN ANIL	**(Online)** Techno-Economic Analysis Of Mobile And Fixed Pv Systems

TRAINING HALL (OMÜ UZEM GROUND FLOOR)	
THEME: INTELLIGENT SYSTEMS/BASIC SCIENCES	
Moderator: Lecturer Dr. Nalan KARAKULLUKÇU	
SPEAKER	**SUBTOPIC**
LUKI ABDULLAH, PANCA DEWI MANUHARA KARTI, IDAT GALIH PERMANA	Development Of Fermented Completed Feed Based On Green Concentrate Indigofera And Mutant Sorgum Samurai-1 For Dairy Cattle Diet
YESSIE WIDYA SARI, WULAN TRI WAHYUNI, NUR AISYAH NUZULIA, UTAMI DYAH SYAFITRI, STEVIA SEPTIANI, IRMANIDA BATUBARA, DIKKY INDRAWAN	From Bench To Market: How We Develop Anticaries Toothpaste Containing Hydroxyapatite And Curcuma Aeruginosa Essential Oil
ERLIZA HAMBALI, ARI IMAM SUTANTO	Enhancing Coconut Shell's Value With Pyrolysis And Its Feasibility For Commercialization
SEMA GÜL, CANAN SEREN	Detection Of Typical Movement Patterns In Babies Treated With Hypothermia With Hypoxic
MEHMET KURU	**(Online)** Fabrication Of Mxene-Based Hydrogels For Wearable Strain Sensor

BREAK - 10:30/11:00

PRESENTATIONS - II. Session - 11:00/12:30

BLUE HALL (OMÜ UZEM BUILDING FLOOR-2)
THEME: SMART SYSTEMS/ENGINEERING
Moderator: Assoc. Prof. Dr. Çetin KURNAZ

SPEAKER	SUBTOPIC
ELİF KAPUSIZOĞLU, CENGİZ TEPE	Investigation Of Factors Affecting Agricultural Spraying Capacity In Unmanned Aerial Vehicles
EMİR ALAPALA, HÜSEYİN GAZİ KARABOLAT, DENİZ CAN AYKURT, İDRİS SANCAKTAR	Integrated Flex Sensor For Assessing Drone Propeller Flex Rate
HAZAL KARA, İDRİS SANCAKTAR	Kinematic Analysis And Simulation Of 4 Dof Robotic Arm
TUĞBA BEDİR ÖZYURT	Economic Analysis Of A Lithium Ion Battery Energy Storage
ONUR DERSE	**(Online)** Alternative Delivery Concepts In Last-Mile Logistics
GİZEM KIYMET SANCAKTAR, SERAP KARAGÖL	(Online) Underwater Image Enhancement Based On Ycbcr Colour Model

BROWN HALL (OMÜ UZEM BUILDING FLOOR-2)	
THEME: INTELLIGENT SYSTEMS/BASIC SCIENCES	
Moderator: Lecturer Dr. Nalan KARAKULLUKÇU	
SPEAKER	**SUBTOPIC**
DYAH ISWANTINI, MIN RAHMINIWATI, TRIVADILA MUHAMMAD RAFI	Chemical Approach For Utilization Of Indonesian Biodiversity As Anti-Gout Herbal Medicine
MARWAN I. HAMD, SABA A. GHENI NALAN TURKOZ KARAKULLUKCU	Performance Of Catalytic Pyrolysis Using Co-Mo/Ac-Zsm-5 With Microalgae
SERDAR DİZMAN, CAFER MERT YEŞİLKANAT, TOLGA AKDEMİR, VAGIF NEVRUZOĞLU, ESRA BAL, RECEP KESER	Detection Of Natural Radioactivity In The Surface Waters Of Savsat Karagol
MADE ASTAWAN, NURHENI SRI PALUPI, TUTIK WRESDIYATI, NURWATI	Tempe Flours Increase Antioxidant Status And Pancreatic Performance Of Diabetic Rats

TRAINING HALL (OMÜ UZEM GROUND FLOOR)
THEME: SMART SYSTEMS/ENGINEERING
Moderator: Assoc. Prof. Dr. Mevlüt GÜRBÜZ

SPEAKER	SUBTOPIC
PEDRO DINIS GASPAR, MARTIM LIMA DE AGUIAR, CHRISTOPHE ESPÍRITO-SANTO, PEDRO DINHO, MARIA PAULA SIMÕES, LUÍS PINTO DE ANDRADE VARIATION	Fruit Packaging Improvement: Reducing The Influence Of Temperature
ÖZGÜR DEMİRCAN, HÜSNÜ ARMAĞAN GÜMÜŞ, MURAT KURU	Bending Properties Of Hemp Powder Reinforced Polymeric Composite Materials With
ÖZGÜR DEMİRCAN, HÜSNÜ ARMAĞAN GÜMÜŞ, ŞEYMA KEYİF	Aging Of Pp And Pa66 Exposed To Diesel Petroleum
SELMA NACAK, MICHAEL U. KUMKE	One-Step Synthesis Of Pei Functionalized Upconversion Nanoparticles Via Autoclave For Biomedical Applications
DOĞUKAN BOZ, EMİRCAN DANIŞMAZ, DAMLA TOPAL, AHMET YASİR SAVCI, İDRİS SANCAKTAR	Detailed Analysis To Determine The Optimum Flight Parameters Of Solid Fuel Rockets

ORANGE HALL (OMÜ UZEM BUILDING FLOOR-2)	
THEME: DIGITALIZATION IN HEALTH	
Moderator: Lecturer Sema GÜL	
SPEAKER	**SUBTOPIC**
EMRULLAH ÖZÜR, YUSUF ÖZBALCI, NURULLAH AKPINAR, SELİM ARAS	Design And Development Of An Industrial Electronic Stethoscope
FURKAN GÖKMEN, İDRİS SANCAKTAR	Instantaneous And Cloud-Based Patient Follow-Up Device
SILMI MARIYA, UUS SAEPULOH, HUDA S DARUSMAN	**(Online)** Kidney Cell-Line Of Macaca Fasicularis As Alternative To Verocells Application
MUSA MARUL, NURHAN GÜRSEL ÖZMEN	**(Online)** Design And Development Of A Multifingered Hand-Wrist Rehabilitation Robot For Stroke Patients
WHITE HALL (OMÜ UZEM BUILDING FLOOR-3)	
THEME: SOCIAL SCIENCES AND HUMANITIES IN THE DIGITAL AGE	
Moderator: Assist. Prof. Dr. Olcay BAYRAKTAR	

SPEAKER	SUBTOPIC
FİLİZ KOÇOĞLU, UMUT KAAN ÖZDEMİR, EMRE SAĞLAM, ALEXANDRA GHITA, RABİA BİLİCİ	Treatment Of Alcohol Use Disorder: A Virtual Reality Therapy For Turkish Culture
SALIH TORA BENZEYEN, ONUR OKUR	The "Life Road" Mobile Application: A New Perspective On Wildlife Conservation In Turkey
TANER ONAY, GAMZE TUNA, CEM POLAT ÇETİNKAYA, NEVVAL BAYCAN, ZEKİ ATIL BULUT	Development Of The Innovation And Economic Growth Cycle Toolbox
ESİN ÖZDEMİR, A. GAMZE YÜCEL IŞILDAR, A. ÇAĞLAN GÜNAL	**(Online)** Creating A Sustainable Campus At Gazi University: Life Cycle Approach And Carbon Footprint Assessment

FINAL PROGRAM – 11:00/12:30
LUNCH – 12:30/13:30
SOCIAL ACTIVITIES – 13:30/17:30

CONTENTS

I. INTERNATIONAL TECHNOLOGY TRANSFER SYMPOSIUM ABSTRACTS

DIGITALISATION OF HADITH SOURCES AND AN EXAMPLE OF HADITH DATABASE AS AN ONLINE REFERENCE SOURCE

Yavuz ÜNAL[1], Fatma EKİNCİ[2]

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ABSTRACT

The digitalisation of social and cultural heritage in nowadays, where digital technologies are becoming part of everyday life, has necessitated the digitisation of classical texts, which are the carriers of religious knowledge and memory. It is observed a diversification in the number of programs and applications that digitalise classical sources in the field of Hadith. In this context, in addition to large digital libraries of classical hadith literature, the existence of databases and search engines that allow searching for hadith or determining ravi relationship networks has greatly facilitated the work of researchers. In the case of the use of new technologies that have recently emerged with the introduction of artificial intelligence, it seems likely that the course of academic studies will change completely. This paper will focus on the opportunities of digitalisation of hadith literature, as well as the need to process the data obtained with systematic integrity and consistency. The subject will be discussed using the example of a database that is different from its counterparts in terms of its richness and infrastructure. The Hadith Database (HVT), designed as a hadith search engine as part of a very comprehensive project that aims to classify, translate and confirm more than 280,000 narrations, 5,000 subject headings and 13,000 rical information, is considered to fill an important gap in the field. HVT, which allows the use of disciplines other than Hadith and Sirah, also facilitates access to authentic and reliable information for non-academic users.

In addition to the technical conveniences offered by such digital databases at the point of access to information, the paper will also include the socio-cultural implications of the circulation of hadith narratives in digital media, as well as suggestions for content regulation that will eliminate the possible risks that digitisation itself may cause.

Keywords: Digitalisation, hadith, database, hadith search.

DEVELOPMENT OF FERMENTED FEED BASED ON THE GREEN CONCENTRATE INDIGOFERA AND THE MUTANT SORGUM SAMURAI-1 FOR DAIRY CATTLE DIET

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ABSTRACT

Cow's milk in Indonesia is an important commodity and product to improve the quality and intelligence of the nation. The constraints faced by dairy farmers include feed prices and the difficulty of obtaining green fodder. Fermented completed feed products are a solution because they can provide an alternative for practical, economical, easily served, hygienic, and available feed due to being produced on an industrial scale. The development of this feed has been carried out in 2020-2023 at the Faculty of Animal Husbandry, IPB University. This product is a new innovation in Indonesia and uses Indigofera green concentrate as a protein source green feed and mutant sorgum var. Samurai 1 as an energy source. Both types of green feed are the main ingredients of the fermented complete feed combined with other materials obtained from agro-industry processing waste. This product is produced using the In-Sacco fermentation method, in which the fermentation process occurs inside takes place in double-layer laminated plastic bags, allowing the ensiling process to occur within 7 days and the product to can be stored for more than 6 months. In the downstream process, this product is produced in the IPB University Teaching Factory, which serves as a place for disseminating products to industries, users, and communities. Based on field test results on 6 farms and a dairy cattle industry, fermented feed products made from Indigofera green concentrate and samurai mutant -1 sorghum were shown to produce higher milk production or equivalent to commercial feed products, reducing feed costs by 27.9% to achieve the same milk production. The quality of milk was not affected by the use of fermented complete feed made from green Indigofera concentrate and mutant Samurai-1 sorghum.

Keywords: fermentation, completed feed, Indigofera, mutant sorghum dairy cattle

MANAGEMENT AND COMMERCIALIZATION OF INTELLECTUAL PROPERTY: BEST PRACTICE IN STP's IPB UNIVERSITY

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ABSTRACT

University through the faculty members and students is believed to produce many technology inventions that potentially commercialize and need intellectual property as part of their output. This study reveals how the STP's IPB University assist the faculty members and students in the patentability and ownership of academic inventions. One important role of STP (Science Techno Park) of IPB University is IP management and commercialization based IPB University regulation in 2020. This new organization is more effective to support the technology transfer especially in protecting IP before being commercialized. Various programs have been carried out including training for drafters of the IP documents, guiding/mentoring the inventor to produce IP documents, and monitoring status submitted IP to the Director General of Intellectual Property, Ministry of Law and Human Right of Indonesian Republic. In addition, communicating with the inventors for any revision of the IP document as suggested by the reviewers from that institutions, by which the IPs are certified. In 2020, there were 80 patents registered, increasing to 10[5,] 130, and 138 in 2021 to 2023 respectively. Since the founding of STP, there have been 50 patents (plant variety releases) that have been commercialized and contributed the royalties to the institution and inventors, although the number varies every year. The role of STP's IPB university is considerably important in protecting the IPB's academic invention before commercialization of IP. It is necessary to note that all of those IP must be belongs to the IPB institution as intangible resources of the state since they are funded by the government.

Keywords: Intellectual Property, Management, Science Techno Park

INNOVATIVE METHODS FOR TECHNOLOGY TRANSFER IN EDUCATION: THE ROLE OF CHATGPT

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ABSTRACT

In recent years, significant developments in artificial intelligence have led to a transformation in people's lifestyles. Artificial intelligence has affected many sectors and the field of education, and various artificial intelligence applications have begun to be used in education. Among these applications, ChatGPT, developed by OpenAI company, is a natural language processing system that has been very popular recently. ChatGPT can offer various advantages or disadvantages to students, teachers, and researchers in education. This study provides information about innovative artificial intelligence applications in education and the potential of ChatGPT, a significant representative of artificial intelligence, in the education sector. The primary advantages and disadvantages of ChatGPT in education, application examples in education, and potential ethical and security issues in education with ChatGPT are explained. In light of this information, the evolution of ChatGPT in education and future expectations are discussed in this study. According to the results, ChatGPT provides advantages such as course processes such as updating course content, preparing course material, preparing exam questions, giving quick feedback, providing personal guidance, and evaluating the student. In addition, it also provides for proofreading and solving complex problems. Besides this, ChatGPT has disadvantages such as wrong information, imperfect information, unfair success, and addiction.

Keywords: Education technologies, Artificial intelligence, ChatGPT

FRUIT PACKAGING IMPROVEMENT: REDUCING THE INFLUENCE OF TEMPERATURE VARIATION

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ABSTRACT

It is fundamental to enhance the shelf life of highly perishable fruits, such as cherries and peaches, which are prone to rapid quality deterioration post-harvest due to increased respiratory activity, transpiration, and ethylene production. This research work proposes an innovative approach to perishable fruit packaging. A novel, reusable "shuttle" type primary packaging that includes an integrated continuous real-time monitoring system was developed. Extensive technical-functional analysis of existing packaging methodologies were carried out to optimize design aspects such as geometry, material usability, and the manufacturing process. Polypropylene Moplen EP240P was selected due to its suitable properties for the intended application. The research work involved numerical (finite elements and CFD) and experimental analyses to predict the structural integrity and mechanical robustness

of the proposed packaging. This includes the integration of functional features such as integral hinges and quick coupling, alongside a detailed examination of the design of molding tools to refine the injection process. Phase Change Materials (PCMs) were included within the packaging tray/alveoli to mitigate temperature fluctuations. Experimental testing in climate chamber, simulating various environmental conditions, and real-life transportation trials demonstrated the efficacy of PCMs in achieving an average temperature reduction of approximately 1.5°C over a span of 5.5 hours, highlighting the potential of advanced packaging solutions in maintaining fruit quality and extending market viability. Thus, a versatile, modular, and robust secondary packaging system was developed, leveraging novel materials and technologies to extend product shelf life. The integration of PCMs into the packaging design presents a promising approach for stabilizing temperature variations during the transportation and storage of fruit and vegetable products, thus ensuring the sustained quality of these perishable goods.

Keywords: Packaging, Fruits and vegetables, Temperature uniformization, extended shelf life, PCM.

CTT-USAMV AGROBIOLIFE - CATALYST FOR THE INNOVATION ECOSYSTEM

Cătălina Mihaela VOAIDEŞ*[1], Narcisa Elena BĂBEANU[2], Ana Cornelia BUTCARU[3], Gina FÎNTÎNERU[4]

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ABSTRACT

The Center of Technological Transfer from the University of Agronomic Sciences and Veterinary Medicine of Bucharest (CTT-USAMV Agrobiolife) aims to facilitate collaboration between the university and other market actors. It acts as a bridge and catalyst for research teams, industrial partners, and other components of the innovation ecosystem. The goal is to bridge the gap between laboratory knowledge and industrial technology by taking additional steps.

CTT-USAMV Agrobiolife is responsible for managing USAMV's intellectual property assets, transferring knowledge to society through innovative services, and generating revenue to further support research and education within USAMV.

The mission of CTT-USAMV Agrobiolife is to capitalize on the results of the university's research, development, and innovation activities, as well as the expertise of the academic community, in the economic environment. The CTT-USAMV Agrobiolife aims to facilitate the development of innovative research based on forecasts, disseminate research-development results to potential customers, and provide assistance for the protection of intellectual property rights. Furthermore, it aims to facilitate the transfer of technologies, inventions, and other creations of researchers, teaching staff, PhD students, and students from the university.

CTT-USAMV Agrobiolife is actively involved in the community life, by transferring knowledge and innovation, developing partnerships with the Romanian and international socio-economic environment, and consolidating integration into international structures.

In 2023, it has in its portfolio 3 patents and 7 new patent applications (besides the 65 already existing), 24 new varieties of plants, 1 license contract and 2 knowledge transfer contracts.

Keywords: technological transfer, industrial property, innovation

TREATMENT OF ALCOHOL USE DISORDER: A VIRTUAL REALITY THERAPY FOR TURKISH CULTURE

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ABSTRACT

Individuals with Alcohol Use Disorder (AUD) experience relapse at a rate of 55%-70% after treatment. Craving, one of the most important predictors of relapse, is triggered by environmental cues. Craving develops as a result of conditioned withdrawal symptoms triggered by environmental cues. Cue Exposure Therapy involves exposure to substance-related cues to extinguish these conditioned responses. Extinguishing the learned behavior in a different environment (e.g., hospital, psychotherapy room) other than the learning environment (e.g., bar, tavern) results in the return of the extinguished conditioned response. This limitation can be overcome by presenting the environments in daily life in which unconditioned and conditioned stimulus pairing occurs in a virtual reality psychotherapy session. This study centers on adapting a virtual reality software proven to reduce the burden of AUD on the healthcare system and prevent relapse, specifically for Turkish culture to address relapse prevention. First, we collected data from 73 people with an average age of 26.53 through the Alcoholic Beverages and Alcoholic Places Identification Form. Based on the frequency analysis, it was decided to adapt 12 out of 22 beverages and keep 10 beverages and all 4 locations as they were in the original virtual reality software. Additionally, 1 beverage (raki) and 1 location (tavern) were added to ensure a more comprehensive representation of Turkish culture. Then, to determine the physical characteristics of the tavern to

be added, we conducted a content analysis involving semi-structured interviews with 9 participants. Based on the results, we defined the physical features of the tavern. Consequently, the original virtual reality software was adapted to Turkish culture, resulting in a software with 23 beverages and 5 locations that can be used in psychotherapy.

Keywords: Virtual reality therapy, alcohol use disorder, craving, cue exposure therapy

TEMPE FLOURS INCREASE ANTIOXIDANT STATUS AND PANCREATIC PERFORMANCE OF DIABETIC RATS

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ABSTRACT

Tempe is an indigenous fermented food from Indonesia. This study analyzed the effects of tempe flours made from germinated and non-germinated soybeans on liver antioxidant status and pancreatic beta-cell profile of rats with diabetes mellitus (DM). The rats were divided into four groups of seven according to the protein sources in the ration (negative control-casein, positive control-casein, DM-germinated soybean tempe flour/GSTF, and DM-non-germinated soybean tempe flour/NSTF). The blood glucose was measured every four days. On day 3^{6,} the rats had their liver and pancreas removed surgically. The positive control rats group had the highest blood glucose level and experienced the most negligible decrease during the experiment. Rats in the NSTF and GSTF groups experienced a reduction in blood glucose level, even though it was not as much as the rats in the negative control group. The glucose level decreasing ability appeared to be better in the NSTF group than in the GSTF and positive control groups. The liver MDA value in the rats of the NSTF group was significantly lower than that in the positive control and GSTF groups. The liver SOD level in the NSTF rats group was also significantly higher than that of rats in the positive control and GSTF groups. Rats fed with NSTF had the best ability to regenerate pancreatic beta cells.

Keywords: Antioxidant, beta-cell, blood glucose, diabetes mellitus, tempe

ONE-STEP SYNTHESIS OF PEI FUNCTIONALIZED UPCONVERSION NANOPARTICLES VIA AUTOCLAVE FOR BIOMEDICAL APPLICATIONS (PEI@NaxScF3+x:18%Yb3+:2%Tm3+:7.5%Gd3+)

Selma NACAK[1], Michael U. KUMKE[2]

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ABSTRACT

Upconversion nanoparticles (UCNPs) have gained significant attention in biomedical research due to their unique optical properties and potential applications in imaging and therapy. However, the synthesis of hydrophilic UCNPs with high stability and biocompatibility in one step remains a challenge. In this study, we present a novel one-step synthesis method for the preparation of polyethyleneimine coated UCNPs using an autoclave-assisted approach. The autoclave serves as a controlled reaction environment, facilitating the formation of hydrophilic UCNPs under high pressure and temperature conditions. PEI is valuable for biological applications. Because the electrostatic attraction between the net positive charge in PEI and the negative charge in the cells can facilitate cell binding affinity. PEI present on the surface of UCNPs is an excellent candidate for conjugation with targeting ligands such as antibodies, thanks to its amino groups. On the other hand, considering that the light absorption coefficient of biological tissues is minimum in the region between 750 and 1000 nm, it can easily be said that the Yb3+/Tm3+ sensitizer/activator pair, which exhibits upconversion from NIR to NIR, is an excellent choice for this field. In addition, Gd3+ doped to UCNPs also provides the magnetic properties required for MRI. The resulting nanoparticles exhibit excellent dispersibility in aqueous media. The synthesized hydrophilic UCNPs were characterized using techniques such as scanning electron microscopy (SEM), X-ray diffraction (XRD) to confirm their size, morphology and crystallinity. Additionally, the optical properties of UCNPs were evaluated through photoluminescence spectroscopy. UCNPs with a size that can be used in the biological field, for example, approximately 125 nm in size and exhibiting high upconversion luminescence intensity at 800 nm upon 976 nm excitation, were obtained. Overall, this one-step synthesis method offers a simple and efficient route to prepare hydrophilic UCNPs with promising applications in biomedical imaging, and theranostics.

Keywords: Upconversion nanoparticles, Hydrophilic synthesis, Autoclave, Biomedical applications, Tm3+ upconversion luminescence

FROM BENCH TO MARKET: HOW WE DEVELOP ANTICARIES TOOTHPASTE CONTAINING HYDROXYAPATITE AND ESSENTIAL OIL OF CURCUMA AERUGINOSA

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ABSTRACT

Dental caries is the most prevalent oral disease and has become major health problem in several countries. Many studies illustrate pathogenesis of caries mainly caused by demineralization process of tooth structure. It is challenging all professionals to investigate further effective also efficient materials and methods in caries prevention. Hydroxyapatite has been known for its bone and teeth remineralization. Curcuma aeruginosa essential oil also contained antibacterial and antibiofilm active agent. We hypothesize that the presence of hydroxyapatite and Curcuma aeruginosa will encourage and intensify anticaries properties of the toothpaste. The aims of this study were: 1) to assess the coupling effect of remineralizing agent with antibacterial and antibiofilm, 2) to conduct market study in order to understand the users' needs, as well as potential risks and market opportunities, 3) to apply the technology transfer mechanism in order for channelling the lab work to the market. I-optimal design, a statistical approach, was applied for optimizing the toothpaste formulae. The optimum formulae showed the capabi-

lity of remineralization, antibacterial, and antibiofilm. Market study showed the positive acceptance from the consumers not only due to the packaging design, but most importantly is the health benefit of the toothpaste. Second stage of market study which was survey test, showed 42% of the respondent were willing to swap to our toothpaste. In order to bring the invention to the market, IPB University's (IPB STP) facilitate the commercialization of the results of the research. IPB STP provides the assistance on setting up the MoU between the IPB and the small and medium enterprises (SMEs). For possible globalization, IPB STP also conducted the IPB STP Industrial Gathering to bridge the researcher with the global market. This event has shown its initial positive impacts.

Keywords: remineralization, antibacteria, antibiofilm, market study, commercialization

THE FUTURE OF DIGITAL ART: THE PROBLEM OF PLAGIARISM AND ETHICAL DEBATES IN ARTIFICIAL INTELLIGENCE SUPPORTED DESIGNS

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ABSTRACT

This article aims to address and understand the plagiarism problem that arises in artificial intelligence-supported designs in the future of digital art and the ethical debates on this issue. The article aims to discuss the problems that arise with the widespread use of artificial intelligence in the field of art and the approaches to solving these problems. The article was prepared using qualitative research methods such as in-depth literature reviews, literature analysis, document reviews, and visual analysis methods. First, the plagiarism problem that arises with the increasing use of artificial intelligence in the field of art is defined. The ability of artificial intelligence to create designs inspired by large databases and samples raises questions about the originality and uniqueness of a work of art. Artificial intelligence algorithms can produce creative outputs that rival works produced by human artists in many fields, from music to visual arts (animated films, photographs, illustrations, music, videos, and digital paintings). Artists experiment with specific styles, colors, and brushstrokes of famous artists, allowing users to instantly create their own unique versions of famous works such as Van Gogh, Dali, Turner, or Monet. Additionally, artificial intelligence can inspire artists and provide them with the opportunity to collaborate with digital systems in ways not previously possible. The article discusses suggestions for solving the problem of plagiarism. These include better control of artificial intelligence algorithms, the development of new techniques to encourage original and unique designs, and stricter control of artificial intelligence-supported designs on copyright issues. In addition, it is an important step for stakeholders in the industry to cooperate to establish ethical rules and protect copyrights. The article also focuses on ethical debates in artificial intelligence-supported designs. The fact that artificial intelligence analyzes the content produced by humans with information obtained from data sources raises ethical questions regarding copyrights. In the article, different perspectives and solution suggestions regarding these problems are presented. Finally, the article offers future predictions. It is predicted that digital art will continue to develop with artificial intelligence, and the plagiarism problem in this field may become even more complicated.

Keywords: artificial intelligence, digital artwork, plagiarism problem

ENHANCING COCONUT SHELL'S VALUE WITH PYROLYSIS AND ITS FEASIBILITY FOR COMMERCIALIZATION

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ABSTRACT

Utilizing coconut shell biomass for value-added products is crucial for sustainability, economic development, and environmental protection. Repurposing coconut shells, often discarded as waste, promotes sustainable practices by reducing waste and optimizing resource usage. Converting coconut shells into activated charcoal, briquettes, and bio-phenol provides economic opportunities in coconut-growing areas, generating revenue, jobs, and improving livelihoods. Furthermore, producing bio-phenol as a bio-disinfectant offers an eco-friendly alternative to chemical disinfectants in poultry farming, helping to reduce environmental pollution and chemical residues in food and water. The research strategy employed in this study is comprehensive, focusing on a multi-product approach to maximize the utilization and potential applications of coconut shell biomass. Through value-chain analysis, the economic feasibility and sustainability of the production process are assessed, while experimental validation and statistical analysis ensure the practical applicability and credibility of the findings, enhancing the reliability of the research outcomes.

The aim of this study is to conduct value-added analysis and cost-benefit analysis related to the processing of coconut shell biomass into various downstream products. These products include activated charcoal, charcoal briquettes for hookah, and bio-phenol for use as a bio-disinfectant in chicken and quail farms. The scope of this study involves analyzing the added value and cost-benefit of processing coconut shell biomass into various downstream products, including activated charcoal, charcoal briquettes for hookah, and bio-phenol. Additionally, the study focuses on the practical applications of these products. Coconut shells were pyrolyzed to produce charcoal, activated using steam. Some charcoal was compressed into hookah briquettes. Bio-phenol was extracted from liquid smoke. Value-added and cost-benefit analyses were conducted. Bio-phenol's effectiveness as a poultry disinfectant was tested. Statistical analysis was performed to assess differences and correlations. The main results of the study include the successful production of charcoal from coconut shell pyrolysis, which was further activated with steam and compressed into hookah briquettes. Additionally, bio-phenol extracted from the liquid smoke by-product showed promising effectiveness as a bio-disinfectant

in poultry farming. Economic analyses highlighted substantial value addition and favorable feasibility of the processing. Experimental tests confirmed bio-phenol's efficacy as a poultry disinfectant, with statistical analysis reinforcing significant findings and correlations.

Keywords: Activated Carbon, Biochar Briquettes, Biophenol, Coconut Shell, Pyrolysis

EVALUATION OF TECHNOLOGY TRANSFER OFFICES FROM THE PERSPECTIVE OF ADMINISTRATIVE LAW

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ABSTRACT

The technology transfer office is a unit tasked with facilitating collaboration between the public and private sectors in Research and Development (R&D) and innovation, as well as protecting intellectual property rights for knowledge and inventions generated within the university. This study aims to evaluate technology transfer offices from the perspective of administrative law. To achieve this, the legal regulations concerning technology transfer offices in Turkish law will be examined. According to Additional Article 32 of Law No. 2547 on Higher Education, the establishment of technology transfer offices requires permission from the Higher Education Council and a decision from the university administrative board. It has been stipulated that technology transfer offices, operating as capital companies, may fund their establishment capital from sources such as funds for scientific research projects or revolving capital revenues, and are exempt from the provisions of Law No. 2886 on State Procurement. The Higher Education Council has been designated as the competent authority for the establishment and oversight of these units. The procedures for granting and revoking activity permits by the Higher Education Council constitute the exercise of administrative tutelage. Apart from the structure regulated in Additional Article 32 of Law No. 2547, according to Article 4/1 of the Regulation on Technology Transfer Offices of Higher Education Institutions, technology transfer offices may also operate in Technology Development Zones as companies in which the university holds shares. Although not explicitly regulated in Law No. 2547, technology transfer offices can also be established as academic units in the form of application and research centers. The establishment, consolidation, or closure of these centers is subject to the approval of the Higher Education Council. Furthermore, technology transfer offices may also be established under a coordination status attached to the rectorate, based on Article 14 of Law No. 2547 and Law No. 2809 on the Organization of Higher Education Institutions, to assist the rector in fulfilling their duties and powers. In this study, the aim is to examine the legal relationship between technology transfer offices, universities, and the Higher Education Council, and to determine the legal consequences arising from an administrative law perspective.

Keywords: University, Technology Transfer Office, Administrative tutelage, Hierarchy

TRANSFORMED KIDNEY CELL-LINE AS AN ALTERNATIVE TO VERO CELLS™ APPLICATION

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ABSTRACT

Kidneys cell culture from mammals is the one source of cell culture that has an essential role in the biomedical field and is becoming essential in biomedical research for drug and vaccine development, particularly for in-vitro assays. Previously, the in-vitro assay mostly utilized Vero Cell which originated from Vervet Monkeys. The Vero Cells itself shares biosafety issue and need to be imported from foreign resources. In this study, we developed the kidney immortal cells (cell-line) which derived from Indonesian Non-human primates resouces, the long-tailed monkeys (Macaca fascicularis) as an alternative to Vero Cells. Kidney cell cultures were prepared using 6-well plates, observed microscopically until reached 70% confluency at the time of transduction. The activation of telomerase enzyme was evaluated 48-72 hours after transduction. Gene expression of proliferation, virus receptor and cell morphology were validated by qPCR. The cultured cells showed heterogeneous in phenotype as they expressed proliferation markers (P53), viral receptor (CD155 and CD46), specific cell markers (CD2[4,] Endosialin, vWF). This result indicates the kidney cell-line has been succesfully achieved, the ability to express certain markers furthermore ensure the potential utilization as in vitro model of vaccine development and bioactive compound assay, and may serve as an alternative to Vero-Cells.

Keywords: Biomedical, In-vitro model, Kidney cells, Long tailed macaque, Transformation

CHEMICAL APPROACH FOR UTILIZATION OF INDONESIAN BIODIVERSITY AS ANTI-GOUT HERBAL MEDICINE

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ABSTRACT

The trend of back to nature for the pharmaceutical industry and society, in Indonesia and in the world, and the increasing of degenerative diseases encourage the finding of a standardized herbal formula for treating degenerative diseases which has selling values and benefits. Herbal medicine market has increased significantly both in Indonesia and the world, and the high of Indonesia biodiversity (2nd in the world) is reinforcing the reasons to find standardized extracts or supplements to some degenerative diseases such as anti-gout. Many plants have been utilized as traditional medicines, including for treating diseases such as gout by inhibiting xanthine oxidase production using flavonoid compounds. In this study, we focused on Indonesian medicinal plants: Sidaguri (Sida rhombifolia Lamk), Celery (Apium graveolens) and Tempuyung (Sonchus arvensis). The research about bio-prospecting of Indonesian biodiversity has been conducted, a preclinically tested and safe formula of anti-gout has been found. The herbal preparation is derived from Indonesian medicinal plants. The strength of this study is that the research has passed through the upstream to downstream with synergistic cooperation with other researchers, such as the aspects of raw materials cultivation, extracts standardization, efficacy trials as well as determination of the formula reaction mechanism and its active compounds.

Keywords: Chemical approach; Herbal medicine, Indonesian biodiversity, Anti-gout

COMPUTER AIDED ANALYSIS IN THE DETECTION OF HADITHS

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ABSTRACT

Detecting hadiths whether they belongs to the Prophet has been done for centuries using the means and methods of the classical hadith detection procedure. As the possibilities of developing technology and the number of resources accessible increase, new detection methods have emerged. Computer Aided Analysis in the Detection of Hadiths is a new hadith detection method that we developed by taking advantage of these opportunities. For this purpose, all the accessible main sources that have survived to the present day have been recorded in the database of a program we designed and coded. While applying this method, word searches are performed and the sources of the narrations are identified, marked and recorded with the help of the tools added to the program somewhere in the database in accordance with the chains of attribution. Then, the elements they contain (what we call Time, Place, Object, Group and Action) are extracted one by one and associated with other elements in the narrations through the program. Thus, a comprehensive data relationship network is created by elements between the narrations in the sources. When this relationship network exceeds a certain complexity, it is concluded that these related data are original.

Keywords: Hadith, narration, database, program, detection.

PERFORMANCE OF CATALYTIC PYROLYSIS USING CO-MO/AC-ZSM-5 WITH MICROALGAE

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ABSTRACT

This study examines the efficiency of catalytic pyrolysis in converting polypropylene into biodiesel fuel using a hydrothermal reactor model TGYF-C. The Co-Mo/AC-ZSM-5 catalyst was manufactured and a series of experiments were performed. The conversion method yielded favorable results using the following analytical techniques: bet, xrd, sem, edx, ft-ir,tga, icp, and nanoparticle size analyzer. The combined action of Co-Mo and ZSM-5 zeolite, together with the large surface area of activated carbon, enables effective decomposition and improvement of pyrolysis vapors obtained from microalgae. Furthermore, the catalyst exhibits exceptional stability after several reaction cycles. The experiments were divided into two parts without using microalgae and with using microalgae (Chlorella vulgaris). The experiments were conducted within a temperature range of 200°C to 325°C (interval 25°C) with residence times of 30, 4^{5,} 60, 7^{5,} and 90 minutes. The impact of temperature and residence time on the quantity and quality of biodiesel was analyzed. The results indicate that higher temperatures and longer residence times generally result in increased biodiesel production. But it is important to optimize these factors to maintain the quality of the product. Samples of biodiesel were tested using devices Grabner Instruments, GC-VUV and Oxygen Bomb Calorimeter. Excellent results were obtained, such as higher heating value reach to 40 kj/kg .This study offers valuable insights into the ideal operating conditions for effectively converting polypropylene into biodiesel, thereby contributing to sustainable waste management and the production of renewable fuel.

Keywords: Catalytic pyrolysis, biodiesel, Co-Mo/AC-ZSM-^{5,} Chlorella vulgaris.

AUTOMATIC DETECTION of POSTURE and MOVEMENT POSITIONS of PATIENTS at RISK of FALLING

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ABSTRACT

The latest estimates of the world population say that the number of older people is increasing significantly. This has a significant impact on healthcare and emergency services. It is seen that most elderly people live alone at home. They want to grow old at home. Older people may experience chest pain, headaches, etc. due to aging. They may experience some abnormal behavior such as: Because they live alone, these abnormal activities go unnoticed. These activities, done unnoticed, can cause serious health problems and eventually death. Therefore, a monitoring system is needed to monitor behavior and alert caregivers.

The main purpose of this study is to develop a system that allows sensitive and automatic detection and monitoring of posture and movement positions in individuals at risk of falling. Through automatic detection of posture and movement positions, the overarching goal is to proactively identify potential hazards, including falls, improper positioning or prolonged immobility. This proactive approach aims to generate timely alerts and notifications to promptly notify healthcare providers or medical doctors, thus facilitating rapid interventions and reducing the risk of accidents or complications.

In the study, the data transferred to the Raspberry Pi from the IMU sensors located at several points on the patient are evaluated with the software. When sudden changes occur from the values determined as normal posture levels, the patient's new posture position is determined and the perception of falling is created. Regarding this situation, the type of fall that occurs is also determined with various variations.

Keywords: Old people, Healthcare, Posture detection, IMU sensor, Raspberry Pi

TESTING THE EFFECTIVENESS OF AN ONLINE DECISION-MAKING SKILLS PROGRAM SUPPORTING THE CAREER DEVELOPMENT OF MIDDLE SCHOOL STUDENTS

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ABSTRACT

This study aims to develop a web-based, online, and modular program to support middle school students' career development and test its effectiveness. The career decision-making program consisted of six different modules. The modules are adjusted according to the grade levels by considering all the middle school levels. The content of the stages consists of games and animations for the career development gains of middle school students. It has been developed to run on iOS and Android operating systems and is accessible through computers, phones, and tablets. The program includes the Profession Recognition-1 Module, Profession Recognition-2 Module, School Life, Personal Characteristics and Professional Relationship Module, Decision Making Module, Goal Setting and Planning Module, and Evaluation Module. A posttest-only control group design was used to evaluate the effectiveness of the modules in the program. As a measurement tool in the study, acquisition tests were created according to each module and class level. The study was carried out in three stages in randomly selected middle schools in the central districts of Samsun. In the first stage, students' opinions on the language, ease of use, and program suitability were taken. In the second stage, the pilot stage, each module of the program was tested on the 5th, 6th, 7th, and 8th-grade students. In the third stage, the effectiveness of the program was tested with 1200 students in the experiment and control groups representing each module and grade level. An independent samples t-test was used to compare the post-test data of the experiment and control groups. As a result of the analyses, it was found that all modules differed significantly ($p < .05$) across all grade levels. Consequently, we can conclude that the career development support program was positively significant and effective at all grade levels.

Keywords: Web based career development program, middle school students, experimental design

HORTICULTURAL AND PLANTATION CULTIVATION INFORMATION SYSTEMS BASED ON WEATHER AND CLIMATE PREDICTIONS: UNIVERSITY-INDUSTRY COLLABORATIONS

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ABSTRACT

The information of weather and climate predictions as part of climate information system needs to be translated into recommendations tailored to user needs, allowing farmers and other stakeholders to directly respond into actions. Through two different projects that have been implemented under the Geodata for Agriculture and Water (G4AW) programme, namely G4AW SmartSeeds and G4AW Spice Up, we utilize the weather and climate prediction information developed as input for providing cultivation recommendations on two different Android apps, namely SIPINDO for horticultural crops, and SPICE UP for pepper plantations. The weather forecasting system was developed using a hybrid approach, a combination of a dynamical downscaling method using the Weather Research & Forecasting Model (WRF) and a statistical downscaling method, resulting to 21 ensemble members for calculating probabilistic forecasts with 7 days lead time. Meanwhile, seasonal climate predictions are developed using a statistical downscaling method which is regularly updated every month with up to six months lead time of rainfall predictions. This prediction results were regularly sent to the Lizard platform for further processing and the results are displayed on both Android applications for end-users. The development of these systems and other supporting information were carried out through collaboration between universities and industrial partners. The development of services in the SIPINDO powered by SmartSeeds app, involving IPB University in collaboration with – a seeds company – PT. East West Seed Indonesia (EWINDO), N&S, Twentee University (ITC), and Akvo. Meanwhile, for the SPICE UP app, IPB University collaborated with – a spice company – Verstegen, N&S, Vandersat, Akvo, and PT. CAN. Both projects led by ICCO Cooperation. These two examples of research collaboration and their implementations for agricultural information systems show a broad potential of using climate information system to provide recommendations and support decision-making processes tailored to user needs, which can increase opportunities for university-industry collaborations.

Keywords: G4AW, weather forecast, seasonal prediction, sipindo, university-industy collaborations

THE EFFECT OF WEB 2.0-SUPPORTED LEARNING ENVIRONMENTS ON PRIMARY SCHOOL STUDENTS' TECHNOLOGY PERCEPTIONS

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ABSTRACT

This study examines the impact of Web 2.0-supported learning environments on the technology perceptions of third-grade elementary school students. The research was conducted using a qualitative approach with 21 students. Students' technology perceptions were evaluated using mind maps created before and after the application.

Implementation Process and Tools: The application consists of 6 hours of Web 2.0-supported activities. Some of the Web 2.0 tools used during the implementation process include Canva, Storyjumper, Instagram, Jigsawplanet, and Learning Apps. These tools were used in the processes of comprehending, reinforcing, and assessing learning outcomes.

As a result of the research, it was determined that Web 2.0-supported learning environments positively influenced students' technology perceptions. Thematic analysis conducted using mind maps showed that students' awareness of and perceptions about technology improved after the application.

Discussion: Mind maps used in this study were evaluated as effective tools for visualizing students' technology perceptions. Mind maps are effective tools used to visualize students' thoughts and conceptual understandings. This research demonstrates the reliability of mind maps in reflecting the development of perceptions towards technology. However, it has been noted in previous studies that the specific structure of any language may influence the interpretation of such visual tools. The findings of this study indicate that Web 2.0 tools have significant potential to enhance students' technology perceptions and can be effective for elementary school students.

Keywords: Technology, life skills, web 2, elementary school

EXAMINATION OF DIGITAL ADDICTION LEVELS OF ASSOCIATE DEGREE STUDENTS

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ABSTRACT

The transfer of technology into daily life has brought positive results and some negative ones. One of the negative results is digital addiction. This study was conducted to examine the digital addiction levels of associate degree students at Ondokuz Mayıs University. The research was conducted as a descriptive scanning method, one of the quantitative research methods. In the study, the data on students' gender, department, time spent on the internet, frequency of social media use, social media platforms used, socio-economic status of their families and educational status of their families were collected.

The data in the research were obtained through the "Digital Addiction Scale" and Google Docs. The population of the research was created by 143 associate degree students, who were randomly selected from the universe to be taught while creating the associate degree education that could be taught at Ondokuz Mayıs University in the 2022-2023 academic year.

The data obtained was analyzed using the SPSS package program. According to the result of the research, there are significant differences between digital relationships according to the departments of associate degrees and the duration of internet interruptions.

Keywords: Associate Degree Student, Digital Addiction, Social Media

TECHNOLOGY TRANSFER EXPERIENCES AND FUTURE CHALLENGES IN AUGMENTED HUMANS TECHNOLOGIES

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ABSTRACT

This study investigates the knowledge and trends in articles about technology transfer experiences and future challenges within the scope of Augmented Human Technologies in the literature. The research method adopted for this study is a systematic review (meta-synthesis). The literature was scanned using a series of keywords related to the concepts of Augmented Human and technology transfer experiences, limiting open access publications. The study sheds light on the challenges and opportunities in integrating advanced technologies to augment human capabilities, addressing both technical and ethical considerations. The diverse range of topics covered in this study lays the foundation for understanding the interdisciplinary nature of research in this domain and the potential for future advancements in augmented human technologies.

Keywords: Augmented Human, Technology Transfer, Ethical Concerns, Systematic Review, Meta-synthesis.

ANALYSIS OF THE 2021 CALLS OF THE TUBITAK 1702 PATENT-BASED TECHNOLOGY TRANSFER SUPPORT PROGRAM

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ABSTRACT

This study aims to analyze the content, scope, and outcomes of two calls opened in 2021 within the TÜBİTAK 1702 Patent-Based Technology Transfer Support Program and evaluate them in the context of national development and technology diffusion. The study examines concepts such as patents, commercialization, and national development. It also analyzes the commercialization of patents from the perspectives of firms, patent owners, and national economies. Additionally, the study investigates the state support and incentives provided for the commercialization of patents through a review of international literature. The study employs content analysis to examine the changes introduced in the 2021 calls of the 1702 Patent-Based Technology Transfer Support Program. It also investigates the locations where the commercialized projects are located. The results show that in the 1st Call, 50% of the projects were commercialized in the same province, 16.66% in neighboring provinces, and 33.33% in different provinces. In the 2nd Call, 56.52% of the projects were commercialized in the same province, 9.10% in neighboring provinces, and 30.43% in different provinces. The study concludes that the 1702 program, launched by TÜBİTAK at the national level, indicates that technology diffusion occurs at the regional rather than national level.

Keywords: TÜBİTAK 1702, Patent-Based Technology Transfer Support Program, Commercialization, Regional Development

APPLICATION OF PRESSURE SCANNING SYSTEM ON BICYCLE SADDLE BASED ON IOT TO PREVENT CRAMPS ON BEGINNERS CYCLIST

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ABSTRACT

Cycling offers various health benefits but poses risks to perineal health, especially for new riders. Prolonged pressure on this area can cause discomfort and serious issues like erectile dysfunction. This study explores using weight-based break intervals to address these risks. Special sensors in the bike seat measured pressure distribution, sending data to a monitoring device. Seven subjects, around 23 years old and weighing between 50 kg and 80 kg, were tested. The system had an overall accuracy of about 78%, with notable differences based on weight. Lighter riders had lower accuracy, as low as 66%, while heavier riders reached up to 93%. These findings emphasize the need to tailor interventions, considering individual rider characteristics like weight, to improve perineal health and reduce risks during cycling.

Keywords: pressure, cyclist, IoT, saddle, cramps

DEVELOPING AN ARTIFICIAL INTELLIGENCE FEEDING SYSTEM TO FEED STREET ANIMALS

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ABSTRACT

Housing and nutrition are the most basic needs of stray animals. Although Animal Shelters are established within the scope of municipal services for these basic needs, this solution is not sufficient. According to statements made by authorities, it is assumed that there are approximately 10 million stray animals in Turkey. Unfortunately, especially in recent times during the pandemic, it has been reported by officials that abandonment rates of animals have reached quite high levels in our country. Also, due to the pandemic, people's inability to leave their homes (especially under normal circumstances, many animal lovers over the age of 65 who feed animals in their neighborhoods have not been able to go out) has led to insufficient nutrition for stray animals. Although municipalities have not neglected to leave food and water in general points such as parks and beaches, this process has developed into a more difficult situation for animals living in the streets. In the presented study, a special technological feeding system controlled by artificial intelligence has been developed for stray animals. According to this, the animal in front of the camera will be monitored for at least 5 seconds by the camera. At the end of this period, when artificial intelligence recognizes what the object in front of the camera is (dog, cat, or bird) using facial recognition technology, it will activate the servo mechanisms in it and pour a certain amount of food (for example, 100g) into the relevant food bowl. The system consists of raspberry, arduino controllers, servo motor, load sensor, LCD screen, adjustment buttons, and other electronic components. The facial recognition technology used in the project is a more durable and secure method for identifying animals than other methods applied.

Keywords: Street Animal, Artificial Intelligence, Feeding Unit, Facial Recognition, Servo System

DEVELOPING AN IOT SYSTEM CAPABLE OF ANALYZING ROAD CONDITIONS AND DRIVER PERFORMANCE USING ESP8266

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ABSTRACT

Vehicles in traffic can be adversely affected by road conditions, leading to various damages such as tire bursts or suspension failures. Often, these damages can result from the driver's rough handling of the vehicle. The aim of this study is to measure the acceleration and deceleration parameters of vehicles using a MEMS (Micro Electro Mechanical System) based accelerometer (ADXL345) in relation to road conditions. Thus, the driving characteristics of the driver can be observed. After determining a rating system based on vehicle acceleration classes, drivers can compare their driving characteristics with this system. In order to prevent fuel consumption resulting from poor vehicle use, vehicles will be encouraged to be used at speeds appropriate to the road surface conditions and thus awareness about fuel economy will be increased. In case the specified acceleration level is exceeded, a visual and auditory warning system will be activated to alert the driver. Drivers will be advised to use the vehicle with low-level acceleration. In the system to be developed for this purpose, the three-axis vibrations measured with the accelerometer mounted on the vehicle will be recorded along with GPS sensor data and transmitted in real-time to a web server (Thingspeak platform) via ESP8266 microcontroller. ESP8266 will collect data from these sensors and transmit them to an IoT platform or cloud service. These data will be used to analyze both road conditions and driver behavior. The data will also be stored in the flash memory of the processor and can be easily sent as reports via email to relevant units over the internet. Thus, a complex system capable of analyzing both road conditions and driver performance will be developed. This project can help drivers have a safer and more comfortable driving experience and contribute to collecting necessary information for road maintenance.

Keywords: ESP8266, drive performance, road imperfections, IoT

DESIGN AND IMPLEMENTATION OF AN IOT BASED MOBILE EEG DEVICE USING ESP8266 MICROCONTROLLER

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ABSTRACT

The main objective of this study is to develop a portable EEG (Electroencephalography) device that patients requiring long-term EEG recordings can use in their own homes. This initiative aims to address the shortage in this field through domestic production and contribute more effectively to the diagnosis and treatment processes of neurological disorders. Traditional EEG examinations typically involve recording of biopotentials via silver or gold-plated electrodes placed on the scalp for a duration ranging from 20 to 60 minutes. In the presented study, a practical measurement system is developed based on the principle of instantly transmitting recorded EEG data to the doctor via email with the press of a button. In the system to be developed for this purpose, the amplified and filtered EEG data obtained from EEG electrodes will be stored in the Flash memory of ESP8266 microcontroller and can be transmitted in real-time to an IoT platform, cloud service, or web server (such as the Thingspeak platform) via ESP8266. Since the data will also be stored in the processor's flash memory, it can be easily sent as a report via email to relevant units using the SMTP (Simple Mail Transfer Protocol) protocol over the internet. These data will be used for patient monitoring, disease analysis, and related purposes. This practical and comprehensive approach will make healthcare services more accessible by enabling patients to monitor their health status more effectively without the need to visit a hospital through remote recording options. Additionally, as a future work, an Artificial Intelligence feature will be added to the project, where the results of patients performing EEG measurements will be interpreted and evaluated by Artificial Intelligence. Thus, a highly technological biomedical device will be produced with domestic resources. It is believed that this device will fill an important gap in the biomedical and healthcare technology field.

Keywords: ESP8266, EEG, IoT, Mobihealth, SMTP

RASPBERRY PI AND ARTIFICIAL INTELLIGENCE BASED AUTOMATIC FAULTY PRODUCT DETECTION: AN INDUSTRIAL SOLUTION PROPOSAL

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ABSTRACT

Industry 4.0 is a concept that emerged with the widespread use of digital technologies and the internet in manufacturing processes. This transformation represents an industrial revolution where smart factories and automated production processes come to the forefront. Among the main components of Industry 4.0 are the Internet of Things (IoT), artificial intelligence, big data analytics, cloud computing, and cyber-physical systems. The main goals of Industry 4.0 include increasing efficiency in production processes, establishing flexible production systems, reducing production costs, and responding to customer demands more quickly. This transformation enables machines in manufacturing facilities to communicate with each other and with humans, collect data, and analyze it, creating a more efficient, flexible, and competitive production environment.

In this study, an innovative solution is presented in the field of faulty product detection designed using Raspberry Pi and artificial intelligence algorithms. Raspberry Pi is a platform known for its low cost, ease of use, and extensive community support. This project utilizes the power of Raspberry Pi to create an image processing and artificial intelligence computer for detecting faulty products. This approach is a significant innovative method that enhances applicability at an industrial scale. The production environment of Borsan Cable company was examined, and it was decided that the focus of the project would be on the SKP (Crimp Cable Lug) product. SKP is a connection element used in electrical systems to connect two different types of conductors. In this study, the aim is to successfully detect and separate SKPs of different sizes moving along the production line as either successful or faulty. It is anticipated that faulty product detection systems developed using

Raspberry Pi and artificial intelligence will emerge as a significant technological advancement in modern production processes. Implementation of this approach can lead to cost reduction in the manufacturing sector, increased customer satisfaction, and competitive advantage

Keywords: Raspberry Pi, Artificial Intelligence, Parsing

BILSEM STUDENTS' OPINIONS ON THE USE OF 360° VIRTUAL TOURS IN SOCIAL STUDIES COURSE

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ABSTRACT

This study aimed to reveal the views of gifted students on using 360° images of historical places in Samsun with virtual reality (VR) glasses during social studies lessons. A mobile application was developed using a design-based research approach. 360° images of 8 historical sites in Samsun, which previously lacked such images, were captured using the Google Pixel camera app. The Kodular.io block-based coding platform was utilized to create the mobile app. Google Cardboard VR glasses, equal to the number of students, were used during lessons. The study group consisted of 11 randomly selected students from the Atakum Science and Art Center BYF-2 Program in Samsun. The developed app was used for 4 lesson hours in the social studies course. Qualitative data were collected through semi-structured interviews with students. Content analysis was employed to analyze the data, involving coding and interpretation. The findings revealed that most students had not visited Samsun's historical sites before and lacked sufficient knowledge about them. However, using VR glasses and the 360° virtual tour in the social studies course enabled students to learn about historical places and objects in their vicinity better. Students found the course interesting and enjoyable. Additionally, it aroused curiosity among students towards the subject and created an expectation for using similar applications in all courses. The research results suggest that the 360° virtual tour experience with VR glasses was more engaging and motivating than virtual tour activities on smartboards. Furthermore, the 360° virtual tour allowed students to visit historical sites independently of time and space constraints. Subjects involving travel and observation, such as history and geography, could be learned more effectively through the 360° virtual tour.

Keywords: Social studies, gifted and talented studens, virtual reality, BILSEM.

PERCEPTIONS OF GIFTED STUDENTS TOWARDS CHATBOTS: KNOWLEDGE LEVELS AND USAGE EXPERIENCES

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ABSTRACT

The main purpose of this study is to reveal the perceptions, knowledge levels, and usage levels of gifted middle and high school students towards artificial intelligence-based chatbots. The descriptive survey method was used, and the scope was limited to individuals living in Samsun. A total of 140 gifted students randomly selected from Atakum Science and Art Center participated. Data was collected through a 12-question questionnaire. According to the findings, 60% of the participants aged 10-18 were male, and 40% were female. The majority (81.4%) were diagnosed with general intellectual ability, and more than half (57.1%) attended public schools. Most participants (79.3%) knew about artificial intelligence and learned about it from the press and internet (55.7%). However, 67.9% used AI-supported chatbots for research and homework (75%), and 51.4% found the use of AI in education useful. Participants thought AI-supported applications would be more efficient in information technologies (80.7%) and foreign language learning (52.1%). However, they believed AI use involves risks such as technology addiction (72.9%) and data privacy (63.6%), and they expected an ideal AI tool to provide accurate information (80.7%) and personalization based on learning style (60.7%). Finally, more than half (55.7%) did not see AI as a threat to humanity. In conclusion, most participants knew about chatbots, generally using them for research, and as education levels increased, they found AI in education more useful. However, they believed AI carries risks, and an ideal AI tool should primarily provide accurate, personalized information. Therefore, careful use of chatbots in education and addressing students' concerns is important. Notably, more than half did not see AI as a threat to humanity, suggesting confidence in humanity's ability to control AI rather than vice versa.

Keywords: Gifted and talented student, artificial intelligence, chatbot, BİLSEM.

CREATING A SUSTAINABLE CAMPUS AT GAZI UNIVERSITY: LIFE CYCLE APPROACH AND CARBON FOOTPRINT ASSESSMENT

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ABSTRACT

As climate change poses a global threat and creates environmental challenges, the adoption and implementation of green transformation in industry is becoming increasingly critical. Green transformation aims to reduce environmental impacts and meet the growing demand and expectations of consumers, investors, and regulators.

Universities play a crucial role in addressing this global challenge. Universities make significant contributions to knowledge, innovation, education, and research in the green transformation process. Technology Transfer Offices (TTOs) play a critical role in transferring knowledge from academia to industry, including applications such as carbon footprint calculation.

For instance, Gazi University's TTO successfully carried out Carbon Footprint Calculations as part of the Green Transformation projects. The studies aim to evaluate the university's environmental impact and establish a sustainable campus model. TTOs also support the industry's green transformation by offering private sector companies carbon footprint calculation and training services. The transfer of knowledge from academia to industry facilitates the integration of sustainable practices into industrial processes and enables their dissemination to a wider audience.

This study determined the sources of carbon emissions on the Gazi University campus and their environmental impact. Alternative methods were developed to minimize carbon emissions and contribute positively to sustainability. For this project, the SimaPro software was used to apply the LCA method by ISO-14040 standards. The successful work has resulted in the transfer of knowledge to the industry. I am grateful for the opportunity to work on scientific research project number 8276.

Keywords: Carbon Emissions, Carbon Footprint, Life Cycle Assessment (LCA), Green Transformation

DIGITAL VIOLENCE PERCEPTION OF YOUNG PEOPLE AGED 18-25 (SAMSUN SAMPLE)

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ABSTRACT

The purpose of this research is to determine the opinions of young people aged 18-25 in Samsun regarding digital violence, the types of digital violence they are exposed to, the platforms where violence occurs, and who perpetrates and why. The aim is to take measures to prevent digital violence based on the findings obtained, and to contribute to future research. In the study conducted with the participation of a total of 301 individuals aged 18-25 from different professions and education levels in Samsun province, internet usage habits, exposure to digital violence, the type of violence experienced if exposed, and how such violence is reacted to were examined. The survey form was prepared and implemented using Google E-Forms, and the data obtained were analyzed using Microsoft Excel, Google Spreadsheets, and SPSS 24 software package. The findings of the research provide information about the prevalence and nature of digital violence among young individuals in Samsun, emphasizing the urgency of taking preventive measures in this field. Additionally, it provides valuable data for future research in this area. According to the research results, it was determined that participants spend a considerable amount of time on the internet but also have concerns about security. Consistent with the literature, it was revealed that most participants were exposed to types of violence such as insults, profanity, and threats, with Instagram being the most common platform for such violence. When it comes to coping methods with violence, it was observed that participants generally choose to block individuals. Furthermore, it was found that those subjected to violence are usually unknown individuals, but it was determined that every social role could be a perpetrator of violence. Particularly, it was emphasized that women are more exposed to digital violence due to their gender, highlighting the importance of digital literacy.

Keywords: Social Media, İnternet, Digital Violence, Media Literacy

A RESEARCH ON ENTREPRENEURSHIP CHARACTERISTICS OF SPECIAL TALENTED STUDENTS: ATAKUM BİLSEM CASE

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ABSTRACT

The main purpose of this research is to determine the personal characteristics of students studying at Atakum Science and Art Centre and the factors affecting their entrepreneurial success. In this context, teaching entrepreneurship and developing students' entrepreneurial characteristics is an important step in increasing the level of successful companies and general welfare in a country. In the method part of the research, survey technique, which is one of the quantitative research methods, was preferred. The research is based on a sample of 150 students in Atakum Science and Art Centre. As a data collection tool, the questionnaire used in Emine Cansız's study "An Application for Determining the Entrepreneurship Characteristics of Süleyman Demirel University Students" was used with permission. The data collection process was carried out using Google E-Forms, and the data obtained were analysed using Microsoft Excel, Google Sheets and SPSS 24 package programme. Chi-Square test and one-sample t-test were applied in the evaluations. According to the findings, most of the gifted students were undecided about the item "Entrepreneurship is a risk". They disagree with the item "Entrepreneurship education should be given only in universities". According to the results of the study, entrepreneurial tendencies, entrepreneurial characteristics, control orientation and creativity characteristics of gifted students were analysed. When a general evaluation of entrepreneurial tendencies is made, it is seen that the majority of the students have a business idea and want to be entrepreneurs.

Keywords: Entrepreneurship, Bilsem, Special Talent, Superior

THE EFFECT OF ARTIFICIAL INTELLIGENCE SUPPORTED PERSONALISED LEARNING SYSTEMS ON THE ACHIEVEMENT OF GIFTED STUDENTS

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ABSTRACT

This study aims to examine the impact of AI-supported personalised learning systems to increase the academic achievement of gifted students. The literature review emphasises that current traditional education methods are based on heterogeneous classroom structures, which are insufficient to meet the individual needs of gifted students and cannot fully reveal their potential. The methodology of the research aims to understand how AI-supported personalised learning systems affect the learning processes of gifted students by combining qualitative and quantitative research methods. In the data collection process; pre-test, post-test and interview forms were used. The findings show that most of the gifted students find personalised learning systems useful and use these applications more because they can learn at their own pace. It was seen that these systems can recognise students' learning styles and speeds and adapt the content and teaching methods accordingly. The results reveal that AI-supported personalised learning systems increase the motivation of gifted students and make their learning experiences more enjoyable. As a result of this study, it is concluded that these technologies have a significant potential in the education of gifted students and can be an effective tool to increase student achievement. It is concluded that gifted students are more successful academically as a result of using artificial intelligence supported personalised learning systems.

Keywords: Artificial Intelligence, Gifted, Bilsem, AI

THE CONTRIBUTION OF DIGITAL STORIES TO LISTENING EDUCATION IN TURKISH LESSON

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ABSTRACT

The main objective of this study is to evaluate the impact of digital stories used in Turkish language classes on students' attitudes towards listening. Digital storytelling is a concept that emerged by combining the tradition of storytelling with modern multimedia tools. The effective use of digital stories in classes can play a supportive role in technology integration. In this context, instructional materials (digital stories) suitable for digital storytelling method have been prepared for use in Turkish language classes, utilizing information and communication technologies. The research, conducted using a mixed-methods approach, was implemented in BYF (Science and Art Center) classes in Atakum district of Samsun province during the first semester of the 2023-2024 academic year. During the eight-week implementation process, digital stories focusing on historical themes or informative/instructive stories were used in the experimental group, along with activities based on these stories. Research data were collected through a listening attitude scale and student interviews. Mann-Whitney U test was used for the analysis of data obtained from the Listening Attitude Scale, while qualitative data were analyzed using descriptive analysis techniques. According to the research findings, there was no significant difference between the pre-test and post-test scores of the listening attitude scale for students in the control group, whereas a significant difference was observed between the pre-test and post-test scores of students in the experimental group. In conclusion, it was observed through student interviews that their attitudes towards Turkish language classes and listening improved positively due to activities based on digital stories.

Keywords: Digital Story, Turkish, Bilsem, Listening

INVESTIGATION OF EDUCATORS' ATTITUDES AND LITERACY LEVELS TOWARDS ARTIFICIAL INTELLIGENCE

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ABSTRACT

Artificial intelligence (AI) technologies have started to be used in many areas of daily life. The main determinants in the use of AI are individuals' literacy skills and attitudes shaped by concerns and beliefs. Educators have a great role in the construction of these attitudes. While forming the attitudes of educators, their level of awareness about AI, AI usage areas, their competences in evaluating the used AI products and their attitudes towards ethical values are important. In this direction, in this study, it was tried to describe the AI literacy awareness and AI attitudes of educators who shape the future generation and to reveal the relationship between them. In this study, relational survey method, one of the quantitative research methods, was used. The data were obtained with the "AI Literacy Scale" and "AI General Attitude Scale". The sample of the study consisted of teachers working in Samsun in the 2023-2024 academic year. Accordingly, the sample consisted of 350 teachers. Descriptive statistics, t-test, ANOVA test; Pearson correlation analysis and regression analysis were used to analyse the data. As a result of the research, it was concluded that AI literacy level was at the level of partially agree, FC attitudes were at the level of agree and literacy predicted attitudes.

Keywords: artificial intelligence, attitude, literacy

THE IMPACT OF TECHNOLOGICAL DEVELOPMENTS IN THE TURKISH DEFENSE INDUSTRY ON TURKISH FOREIGN POLICY

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ABSTRACT

States, which are the main actors in international politics, have always needed defense in every period of history in order to achieve their foreign policy visions and protect their national independence and security. Defense industry is a strategic industrial branch that has the potential to increase the competitiveness of countries on a global scale. What is expected from states that want to have a defense force is to minimize foreign dependency in the defense industry, to meet national defense requirements and to create a modern defense industry that keeps pace with technological developments in the globalizing world. The development of the defense sector has an important role in maintaining and developing economic, military and political stability, and is also effective in the making of foreign policy. With the changing world order and new security approaches due to globalization, Turkey is developing defense strategies that produce domestic and national defense systems in line with technological innovation in the international arena. Recently, it has been seen that the Turkish defense industry has a major role in solving the security problems in the world, especially in countries such as Ukraine, Azerbaijan, Syria and Libya. This situation affected Turkey's position and foreign policy both regionally and internationally. In this study, the contributions of global technological innovations in the field of defense industry to the Turkish defense industry and the impact of these developments on Turkish foreign policy were examined using the qualitative research method. The results indicate that Turkey's defense industry breakthroughs have increased the influence and effectiveness level of the Turkish Armed Forces and contributed to the establishment of national security. It is thought that this process changes the level of success of political attitudes and actions in Turkey's foreign relations and supports the goal of a multi-axis and less dependent foreign policy.

Keywords: Technology and Innovation, Turkish Defense Industry and Turkish Foreign Policy.

EVALUATION OF RENEWABLE ENERGY STRATEGIES WITHIN THE FRAMEWORK OF DEVELOPMENT PLANS IN TURKEY

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ABSTRACT

Within the scope of Turkey's development plans, renewable energy strategies are of great importance for sustainable development and energy security. Turkey has a high potential in terms of renewable energy sources such as geothermal, solar and wind energy. In particular, solar energy stands out with its high sunshine duration in the southern regions of the country. The government offers a variety of financial incentives and tax breaks to encourage investments in renewable energy projects. With these incentives, it is aimed to increase the interest of the private sector in the field of renewable energy and its assistance to the government in implementing new projects. However, in 202[1,] a policy change was made in the price incentives offered for electricity generation based on renewable energy sources, and payments started to be made in Turkish Lira instead of US Dollars. The aim of the study is to evaluate the policies implemented in parallel with the strategies determined for the dissemination of renewable energy sources in Turkey within the framework of the announced development plans. In this context, first of all, development plans will be examined, the supports given to renewable energy sources in the world will be briefly presented. Afterwards, the policies implemented in Turkey will be compared with the policies implemented in other countries, and an evaluation will be made especially based on the concept of sustainable development. Thus, according to the results obtained, inferences and suggestions will be made on behalf of Turkey. This study analyses the impact of the integration of renewable energy sources within the framework of Turkey's development plans using qualitative methodology. The research findings reveal that development plans promote the use of renewable energy sources and increase their efficiency and effectiveness. In order to build a sustainable future, it is imperative to expand the use of renewable energy resources, reduce environmental pollution and use energy resources efficiently. Environmental challenges encountered in energy production and consumption processes should be minimized and resources should be planned in an economic, reliable, and optimum manner.

Keywords: Renewable Energy, Sustainable Development, Energy Security, Financial Incentives, Tax Reductions

POSSIBLE ETHICAL ISSUES THAT MAY ARISE FROM THE USE OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN PUBLIC SERVICES

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ABSTRACT

This study aims to examine the social effects of artificial intelligence systems to be implemented in public services and the possible problems that may be encountered. The study is based on reports and documents on Artificial Intelligence prepared by independent research organisations as well as countries such as the United Kingdom, the United States, China and Turkey. From the material analysed, it is observed that the main problematic area faced by Artificial Intelligence systems is ethical issues. Although the issues in these reports and documents vary under the influence of geographical and national differences, issues such as prejudice and discrimination, transparency and accountability, privacy and data security, reduced human control, unemployment and responsibility are frequently emphasised and generally accepted in the reports. The examination of these problems is important in the literature in terms of examining the ethical problems in public services at the point of making the distinction between human and machine in the world of digital transformation. Because, trying to find solutions to these ethical problems leads to the belief that human beings can control artificial intelligence technology. However, at this point, it is seen that the legal regulations made by countries regarding artificial intelligence technology are insufficient. Although the legal regulations on technology are slow in today's rapidly advancing technology, it is still thought that the developments from the legal texts that are considered to be put into force are promising. In this study, firstly, the concept of artificial intelligence in public services will be mentioned, and then the use of artificial intelligence systems in public services and the problems that arise will be discussed.

Keywords: Artificial Intelligence, Ethics, Legal Regulation

ETHICS AND PUBLIC ISSUES IN THE CONTEXT OF THE USE OF VIRTUAL REALITY TECHNOLOGY IN PUBLIC SERVICES

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ABSTRACT

Virtual reality technology, which is one of the innovations that emerged as a result of the development and advancement of technology, is seen to be used in many areas today. With the digitalizing world, it can be said that virtual reality technology is used on many platforms, and various problems may be encountered in the future with this technology. The aim of this study is to evaluate how and in what way virtual reality technology will be used, who or by whom it will be shaped in the context of the ethical problem. The study is important in terms of determining how the positive and negative externalities that occur in the virtual space will affect the consumers and producers of the public sector. As a result of the problems that may occur in the future with virtual reality technology, the system created and the necessity of an authority that can control this system are foreseen. Examining the literature in depth and examining the laws related to the subject of the study in the context of ethics constitutes the method of the study. In this study, which concludes that virtual reality technology, which has a decentralized structure, will be the subject of various public regulations in the near future, just like other goods and services in the market, and that various legal regulations should be made on this issue, virtual reality technology will be mentioned first, and then the positive and negative externalities of virtual reality in the public sector will be examined in terms of ethics.

Keywords: Virtual Reality, PublicIssue, Externalities, Ethics.

THE IMPACT OF INFORMATION TECHNOLOGIES ON PUBLIC SERVICES IN TÜRKİYE: THE CASE OF E-GOVERNMENT

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ABSTRACT

The rapid developments experienced by humanity in information and communication technologies affect public services as well as all sectors. The most important issue of change in today's society and organizations has been digital transformation. Digital transformation makes it possible to provide public services in a more efficient, effective, transparent and participatory manner. In addition, citizens also think that they can become more active participants by observing new and technological opportunities that can affect collective decision-making processes. In Türkiye, this technological development has actively entered our lives with the E-Government. Türkiye is taking important steps in the field of digital technology. In this study, it was wanted to examine the Impact of Information Technologies on Public Services in Türkiye by using qualitative research method. After all, although digitalization has a fast and efficient use area, there are some disadvantages as well as advantages. Not everyone may have the opportunity to use and access technologies, in short, it can create an unequal environment. It may create insecurity about the sharing of personal data. Software errors, systemic problems can make digital technologies open to the outside world. There are measures to be taken in response to these. The necessary infrastructure can be provided or more than one software can be used. In addition, digital literacy trainings can be provided and free internet access can be provided. Defense systems can be established by providing cyber security trainings. With many measures such as these, when the problems in front of technology are removed, it is possible to safely process quickly and easily in public services and achieve healthy solutions. It is thought that digital technologies will continue to play an important role in the developing world every day in the future.

Keywords: Technology, E-Government, Public Services, Digital Transformation

DESIGN AND DEVELOPMENT OF A MULTIFINGERED HAND-WRIST REHABILITATION ROBOT FOR STROKE PATIENTS

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ABSTRACT

Stroke can cause the dysfunction of hand so that patients lose the ability to perform daily activities and social ability. Due to the new control techniques and microactuators technology, more sophisticated exoskeleton devices which are more flexible, responsive and smart are being developed. This paper presents a multifingered hand function rehabilitation robot with 18 DOF which could be used to train the patients' hand after stroke. A cable driven flexible four bar mechanism system is designed. Then we designed a two-way output linear actuator to drive fingers for rehabilitation training. For each DOF, a motor is included. The robot can be used for self-controlled rehabilitation therapy supporting both the flexion/extension and abduction/adduction motions of each joint in the hand, and thumb. Thereby the rehabilitation effect of fine functions of fingers are promoted. We have completed the hardware design of the flexible hand robot and developed the control software of the flexible hand, thus completing the development of the hand function robot. The kinematic analysis has been carried out using MATLAB. The obtained results confirmed that the robot hand conforms to the objective.

Keywords: Hand-Wrist Rehabilitation, Stroke, Exoskeleton, DC Motor Control

TECHNOLOGY TRANSFER SYSTEMS IN THE WORLD

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ABSTRACT

With the effects of globalization and recent digitalization, the proliferation and diversification of technological innovations have become increasingly important in facilitating mobility among businesses, institutions, universities, countries, and geographical regions. As the share of science and technology within economic growth increases, there arises a need for the development of national strategies, technology transfer organizations, and mechanisms to monitor and enhance technological performance. Rather than considering technology transfer solely as individual actions undertaken by institutions and organizations, it can be argued that focusing on the importance of technology transfer systems and aiming for comprehensive improvement will lead countries to gain advantages in technological competition. This study aims to examine the concept of technology transfer systems and conduct an analysis of the status of technology transfer systems in major countries around the world and in Türkiye. A descriptive literature review was conducted to shed light on future studies. Although scattered data on technology transfer in various countries can be found in numerous sources and reports, it is evident that new frameworks are needed to compare these data. In this compilation study, which aims to explain the current situation of technology transfer systems, academic studies that examine the technology transfer systems of 15 countries, including Türkiye, across the USA, Europe and Asia, directly at the main title level or indirectly such as comparison, were used. In these studies, the characteristics attributed to the systems and successes of different countries are summarized and presented in a table. The findings indicate that leading countries in technology transfer possess "strong collaboration between academia and industry, robust intellectual property laws, and a culture that fosters entrepreneurship and innovation." Türkiye is a promising country in the field of technology transfer; however, it is important to address potential challenges and issues in the development of the technology transfer system.

Keywords: Technology Transfer Systems, World, Türkiye, Entrepreneurship, Innovation

THE IMPLEMENTATION OF E-DEMOCRACY IN TURKEY WITHIN THE FRAMEWORK OF THE RELATIONSHIP BETWEEN POLITICS AND TECHNOLOGY

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ABSTRACT

Social changes are taking place with the technological developments and advancements across the world. The most important of these changes is the inherent crisis of representative democracy and the obstacles that arise due to the problems in meeting the demands of the existing decision-making processes, time and space constraints. With the changes in information and communication technology spreading to all areas of life, country administrations feel obliged to make innovations. Electronic state applications, which emerged with the addition of the letter -e- to the public services of state institutions, have put countries into a new democracy process. E-democracy assumes important functions and a complementary role in achieving a more transparent, more participatory and accountable structure. The step taken by Turkey to establish participation, accountability and transparency, which are gaining importance today, has been with e-government. Turkey has stepped into information and communication technology with a system that transfers the transactions to be carried out by citizens in the state institution to the electronic system and then has made attempts to apply technology in decision-making processes. However, good technology alone does not work at this point. It is also very important that the individuals in the society have democracy awareness. In Turkey, the society has not yet succeeded in reaching the targeted democracy awareness in decision-making processes. In this direction, e-democracy practices that will increase participation should be implemented in some regions. In this context, the aim of the study is to explain the concept of e-democracy, which has come to the agenda with the development of information communication technologies, and as a method in line with these objectives, the concepts that form the basis of the study will be explained and the activities carried out will be evaluated. This study is based on qualitative research. In this framework, document scanning and survey techniques were used. As a result, the current situation with examples of e-democracy applications from the world and Turkey has been determined and the issues recommended to be done in addition to the studies carried out have been put forward.

Keywords: E-Democracy, Digital Democracy, E-Government, Governance

OPEN SOURCE LINEAR PROGRAMMING LIBRARIES AND THEIR USE IN AGRICULTURAL OPTIMIZATION

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ABSTRACT

Nowadays, open source linear programming libraries offer powerful tools for farmers and researchers who want to increase efficiency and manage resources effectively in decision-making processes in the agricultural sector. This paper reviews open source linear programming (LP) libraries used in agricultural optimization applications. Within the scope of the study, PuLP, GNU Linear Programming Kit, OR-Tools and SciPy libraries, which are the most prominent open source linear programming libraries in linear programming, were examined.

This study examines the application of linear programming principles in agricultural optimization, beginning with a brief overview of its fundamental concepts. The discussion elaborates on how these libraries address various challenges encountered in agriculture, exemplified through applications in agricultural productivity, resource management, production planning, inventory management, marketing, and distribution.

Furthermore, the paper provides a detailed analysis of how open-source linear programming libraries contribute to agricultural optimization efforts. It discusses the unique features and advantages of selected open-source platforms, supported by practical examples illustrating their application in solving agricultural optimization problems. By outlining solution strategies derived from these applications, the paper aims to serve as a valuable resource for researchers, farmers, and software developers seeking to enhance productivity and promote sustainable practices in agriculture.

Keywords: Linear programming, Agricultural optimization, Open source libraries, GLPK

PULL REQUEST BASED AUTOMATIC DEFECT DATASET GENERATION TOOL

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ABSTRACT

In modern software development, predicting potential defects is crucial for enhancing software quality and maintaining project efficiency. The dataset of previously encountered defects is a critical component of the models developed to detect defects in advance. Creating a dataset is one of the most time-consuming phases in the studies.

Most studies in this field use the JIRA job tracking system and Git version tracking system to create the dataset that causes defects. However, popular open source software tends to use the GitHub platform rather than JIRA and Git. Effective use of Pull Requests (PRs) is critical for quality assurance in software development, especially in collaborative environments like GitHub. It is expected that the creation of a dataset will be faster and more reliable by using labels such as 'this code contains defect' added to pull requests by software developers.

The study aims to detect software defects by using B-SZZ and AG-SZZ algorithms with labels from PRs selected from open source projects on GitHub. After identifying the code believed to be responsible for the defect, the tool automatically calculates the product and process metrics of the code in its current and corrected states. The study presents an open-source tool that accelerates the process of collecting software metrics, which is crucial for software defect prediction models, and reduces manual intervention.

Keywords: Defect prediction, bug database, code metrics, static code analysis

DETECTION OF NATURAL RADIOACTIVITY IN THE SURFACE WATERS OF ŞAVŞAT KARAGÖL

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ABSTRACT

All living things are exposed to ionizing radiation emitted from natural and artificial radiation sources that already exist in our world. Therefore, it is important to determine the radioactivity levels of living areas and touristic areas. In this study, natural (238U, 232Th and 40K) radioactivity concentrations in lake water samples taken from Şavşat Karagöl located in Karagöl-Sahara National Park in Artvin province were determined using a high purity germanium detector (HPGe). In addition, the coordinate of each sampling point was recorded with a GPS device (Magellan Explorist 510). It was determined that 238U, 232Th and 40K concentrations in the lake water samples varied between 0.82-4.44, 0.38-1.76 and 8.39-22.71 Bq/L, respectively. The mean radioactivity concentrations were found as 1.97 ± 0.43 Bq/L for 238U, 1.01 ± 0.23 Bq/L for 232Th, and 15.68 ± 2.26 Bq/L for 40K. The average radioactivity concentrations found were compared with the values recommended by international organizations, and as a result, it was shown that the radioactivity from the examined radioisotopes would not pose a health risk for the visitors of Şavşat Karagöl.

Keywords: Radioisotope, Lake water, Radiological risk, Artvin

TECHNO-ECONOMIC ANALYSIS OF MOBILE AND FIXED PV SYSTEMS

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ABSTRACT

Solar energy stands out as a clean and renewable energy source. Installation of solar energy systems provides important benefits such as energy security and sustainability. This study presents a techno-economic analysis of fixed and mobile photovoltaic (PV) systems. Technical features, installation costs, energy production capacities and lifetimes of fixed and mobile PV systems will be evaluated through literature review and expert opinions. Additionally, worldwide analysis of fixed and mobile PV systems will be presented with the necessary research. The economic analysis will be analyzed using HOMER software. This study is expected to provide guidance on which type of PV system is more suitable for investors and energy producers. It is also thought that it will contribute to the development of solar energy policies and programs.

Keywords: Mobile PV systems, fixed PV systems, solar energy, technical analysis, economic analysis

INTELLIGENT HEATER HEAD CONTROL FOR DIESEL FUEL FILTERS

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ABSTRACT

Diesel engines are known for their superior performance and efficiency compared to other internal combustion engines. However, they are sensitive to fuel defects. To ensure efficient burning, diesel must pass through a fuel filter. Additionally, diesel fuel contains paraffin which crystallizes and clogs the filter at temperatures around 5°C. Therefore, it is crucial to maintain a temperature above 5°C for efficient filtration and use of diesel fuel. Current fuel filters heat the fuel using built-in heating equipment. However, these filters use bimetal thermostats which have low sensitivity and a wide hysteresis curve because of their structure. This can cause the filter to clog if the diesel is kept below the required temperature, and decrease efficiency because of energy loss if heated above. Furthermore, thermostats have a limited working life because of their mechanical structure. The filter's operating conditions subject the thermostat to numerous on-off cycles and mechanical shocks. This study aims to enhance temperature control precision by replacing the commonly used bimetal thermostat with a microcontroller-controlled PID heating algorithm. The hardware and algorithms were tested in a filter with a heating element, and the results were recorded. Upon analysis of the results, it was found that temperature control was achieved with greater precision, with an error rate down to ±0.1°C. Additionally, the use of a semiconductor electronic component as a switching element, instead of a mechanical thermostat, is predicted to increase the filter's service life.

Keywords: Diesel Filter, Diesel Heating, PID, Smart Heating System

AGING OF PP AND PA66 EXPOSED TO DIESEL PETROLEUM

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ABSTRACT

In this study, particular attention has been paid to the superior durability displayed by the polypropylene (PP) and 30 wt% short glass fiber reinforced polyamide 66 (PA66) polymers when in contact with diesel and similar petroleum derivatives. The high durability exhibited by those polymers under diesel environment conditions has been considered a critical factor for maintaining and optimizing long-term material performance. The aging process in polymers that interact with diesel is critically important, especially for applications in the petroleum industry and in polymer-based piping systems.

The purpose of this study is to investigate the bending properties of PP and PA 66 specimens which they left diesel environment conditions (50 oC) for 2.5 months. The specimens of polypropylene (PP) and 30 wt% short glass fiber reinforced polyamide 66 (PA66) polymers were fabricated using injection molding machine (10 Ton, Permak Makina, Istanbul/Turkey). After that, the specimens were left in a diesel in order to conduct wet aging process. Later, bending tests were performed on the specimens from diesel aged and dry with INSTRON 5982 100 KN universal test device at Ondokuz Mayıs University (OMU) KITAM Central laboratory.

According to the bending test results, the bending modulus and bending strength of PA 66 samples were higher than other PP samples. The bending strength of PA 66 samples containing glass fiber is approximately 210 MPa in dry conditions and approximately 184 MPa in 50-degree diesel petroleum conditions. The bending strength of PP samples is approximately 47 MPa in dry conditions and approximately 15 MPa in 50-degree diesel petroleum conditions. Another important result is that when all samples (both PP and PA 66) were left in diesel oil conditions at 50-degrees for approximately 2.5 months, both their strength and modulus decreased slightly compared to the dry samples.

Keywords: Diesel aging, PP and 30 wt% short glass fiber reinforced PA66 polymers, mechanical strength, material science

Acknowledgment: This work was supported by the TUBITAK TEYDEP 1505 (Project Number: 5220022).

BENDING PROPERTIES OF HEMP POWDER REINFORCED POLYMERIC COMPOSITE MATERIALS WITH POLYPROPYLENE MATRIX

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ABSTRACT

In recent years, the use of natural fibers as reinforcement elements in thermoplastic or thermoset matrix composite materials, instead of traditional synthetic glass and carbon fibers, has frequently found a place in both academic research and industry. Natural fibers like flax, hemp, nettle, jute, sisal, and kenaf, are highly suitable for reinforcing polymeric composites due to their environmentally friendly nature, low production costs and lower energy consumption in production. The purpose of this study is to develop thermoplastic matrix polymeric composite materials reinforced with natural fibers from locally and nationally valued fiber plants like hemp. These developed innovative products will be recyclable, strong, lightweight, and aesthetically pleasing compared to their counterparts.

Hemp powders were prepared by cyclic grinding machine (Unal Makine, Izmir/Turkey). Later, the compounds of hemp powders (0 wt%, 5 wt%, 10 wt%) and polypropylene (PP) were prepared using double screw extruder machine (RTX-T1[6], Kokbir Makina, Kırklareli/Turkey). After that, the specimens of 0 wt%, 5 wt%, 10 wt% hemp powder reinforced polypropylene (PP) composites were fabricated using injection molding machine (10 Ton, Permak Makina, Istanbul/Turkey). Three points bending tests were performed on the fabricated specimens with INSTRON 5982 100 KN universal test device at Ondokuz Mayıs University (OMU) KITAM Central laboratory.

According to the bending test results, the bending modulus of specimens were increased by increasing hemp powder content. The highest bending modulus and strength were obtained by 10 wt% hemp powder reinforced PP composites (1.3 GPa and 32.7 MPa). The bending modulus and strength of pure PP polymer was 1.0 GPa and 33.4 MPa. The bending modulus of 10 wt% hemp powder reinforced PP composites was 27% higher than that was with 0 wt%. Our study showed that

10 wt% hemp powder ratio was the optimum rate for the hemp powder reinforced PP composites.

Keywords: Hemp powder, composite materials, PP thermoplastic polymer, natural fibers, bending properties

Acknowledgment: This work was supported by the TAGEM (Project Number: TAGEM 20/AR-GE/23).

INVESTIGATION OF FACTORS AFFECTING AGRICULTURAL SPRAYING CAPACITY IN UNMANNED AERIAL VEHICLES

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ABSTRACT

Today, the agricultural sector has experienced a decline due to factors such as the increase in urban population, decrease in available labour force for agricultural work, and decrease in raw material stocks. As a result of these negative developments, there has been an increased demand for technologies that can reduce labour costs. Agricultural unmanned aerial vehicles are one of the most up-to-date and increasingly widespread technologies used for this purpose. This study measured the spraying width of a domestic agricultural unmanned aerial vehicle, which varied depending on the flight altitude. The maximum spraying width was found to be 8m. The field data recorded the width range of 1.5-8m, height range of 3-10, spraying flow rate range of 3-15 l/s, and speed range of 1-10 m/s. The aircraft sprayed one hectare in an average of 12.5-125 seconds when the flight speed was set to 1-10 m/s. The tests were conducted during morning or evening hours when wind speed was zero and the plant height was 30 cm. Different parameters were tested, and it was found that the maximum efficiency was achieved at a speed of 7 m/s and a height of 6 m. It was concluded that the correct adjustment of height, flight speed, and inter-line spacing is crucial for agricultural spraying efficiency when using unmanned aerial vehicles.

Keywords: Agricultural Unmanned Aerial Vehicle, Agricultural Spraying, Agricultural Drone

PUBLIC, UNIVERSITY AND INDUSTRY COOPERATION IN TURKEY: THE ROLE OF TECHNOLOGY TRANSFER OFFICES WITHIN THE FRAMEWORK OF DEVELOPMENT POLICIES

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ABSTRACT

It is very important to ensure national goals in the public and industrial ecosystem. Various resources should be developed and mobilized within the framework of R&D and innovative planning Decrees. The promotion of qualified knowledge production of universities and the commercialization processes of technology transfer offices should be brought to the fore in terms of the discipline of public administration. The main purpose of our study is to conduct analyses on the connection between public administration and technological developments within the framework of the development policies prepared in our country, and to evaluate the digital/ technological transformation experienced in our public administration with the results obtained. Process and technological infrastructure improvements should be made so that new technologies such as big data, cloud computing, mobile platforms, Internet of things, artificial intelligence, blockchain can be used in improving public services. The method of our study is documentary analysis and interdisciplinary work and sectoral clusters are discussed, while examples of the difficulties experienced in this process and how to overcome them are given. Document analysis process When we examine the historical process of the University-Industry Association, Five-Year Development Plans have become an important source for this subject. Ministry Action Plans, Ministry of Industry and Technology Industrial Strategy Document 202[3], Ministry of Industry and Technology 2024-2028 Strategic Plan, TÜBİTAK's Technology Transfer Offices Support Program with code 1513 and especially the 12th Development Plan documents were scanned and as a result of the study, the importance of Technology Transfer Offices in both university and regional development and R&D programs public opinion of academics within the framework. Environments that will enable them to cooperate with industrialists are created and opportunities are developed to propose solutions to the problems of industrial countries.

Keywords: Development policies, Technology transfers, Industry, Digital transformation, Technology transfer offices.

ALTERNATIVE DELIVERY CONCEPTS IN LAST-MILE LOGISTICS

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ABSTRACT

Last-mile logistics means delivering the products to the last point. Due to increasing demand/volume, costs, and time pressure in last-mile logistics, delivery services are actively seeking sustainable and efficient delivery methods. Situations such as not being able to reach customers and working hours have led to unattended approaches. Unattended delivery involves dropping off packages at designated areas regardless of the consumer's presence, thus streamlining the last-mile process. Traditionally unattended delivery involved leaving orders on the doorstep or with a neighbor. In this study, innovative unattended distribution approaches and the problems of these approaches are discussed. Suggested innovative unattended approaches include reception boxes, controlled access systems, trunk delivery, collection points, and crowdsourced delivery among friends. Reception boxes act as consumer-specific containers for packages, providing a solution for delivery in specialized containers at the consumer's site. Controlled access systems offer smart home integration, allowing providers to securely access consumer facilities. Trunk delivery uses delivery into the trunks of private cars as mobile delivery points. Collection points refer to a pickup point other than the customer's place of residence. Crowdsourced delivery among friends benefits from social networks to coordinate deliveries and increase flexibility. When these approaches are examined, reception boxes and controlled access systems can be considered a sub-branch of traditional home delivery. Many customers have serious reservations about controlled access systems and trunk delivery deployment because they fear invasion of privacy and theft. Delivery to the trunk of a private vehicle is attended with alternative delivery points and time slots according to customers' changing locations throughout the day. Having to go to a collection point can significantly reduce e-commerce convenience and may only be acceptable to a small group of online shoppers. The biggest problem with crowdsourced delivery among friends is the lack of privacy and the need for one.

Keywords: Last-mile Logistics, Alternative Delivery Concepts, Unattended Delivery Concepts

INTEGRATED FLEX SENSOR FOR ASSESSING DRONE PROPELLER FLEX RATE

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ABSTRACT

Drone technology is now widely used in many fields, including film production, military operations and various industrial applications. However, deformations in drone propellers over time cause problems such as flexing and buckling during flight. Such deformations can increase the drone's safety risks and negatively affect its performance. Therefore, it is of great importance to accurately measure the propeller flex rate. In addition, observing the effects of the amount of flex in drone propellers on flight efficiency can serve as a guide for future designs. By attaching propellers of different materials with equal lengths and angles to drones under the same conditions, the effects of varying amounts of flex on factors such as current consumed, take-off point and stable flight can be investigated. In this study, a flex sensor is integrated horizontally on the propeller to observe the propeller flex rate in a real environment. This sensor utilizes the resistance property of carbon material to accurately measure the propeller flex rate. In this way, the safety and performance of the drone in terms of propellers were ensured before the flight. During the study, three different propellers of 100 mm in size were used, consisting of never-used, lightly used and deformed plastic material. Flexibility sensors were integrated horizontally on two different propellers made of plastic and carbon materials and their flexing properties were tested in a real environment. The data obtained as a result of these tests were visualized with graphs and a detailed propeller analysis was carried out. In addition, according to the results obtained, the impact of the deformation of the propellers in terms of safety risks and performance losses were also evaluated. This study aims to contribute to a safer and more efficient use in industrial applications by providing a solution-oriented approach to the deformation problems in drone propellers.

Keywords: Drone Flight Safety, Flexibility Sensor, Propeller Deformation

DEVELOPMENT OF NOVEL HEATER PLATES FOR DIESEL FUEL FILTERS WITH SMART HEATERS

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ABSTRACT

Due to the increasing need for transportation due to population growth, the gas emissions released into the atmosphere from vehicle exhausts are dramatically rising due to increased vehicle use. Many studies are carried out in the literature to prevent exhaust emissions and reduce their environmental impact. With these studies, the efficiency of vehicle engines is improved, and exhaust gas emissions and fuel consumption are reduced through various methods. In this sense, PTC (Positive Transfer Coefficient) heaters are also used to increase the burning efficiency of diesel fuel. The surface geometries of the plates that carry electric current to PTC heaters and transfer the heat energy produced by PTC heaters to diesel fuel are important in providing high thermal performances. This study investigated the effects of newly designed surface geometries (notches) for the mentioned heater plates on fuel heating performances numerically and experimentally. For this purpose, different surface geometries (notches) have been designed to improve heat transfer and increase the efficiency of the heating plates. The Computational Fluid Dynamics (CFD) method was used for analyses. Improving the heat transfer performance of the heater plates designed to heat the diesel fuel during the filtering process aims to reduce fuel consumption and gas emissions during engine operation, especially in cold weather (below +5 °C). As a result of numerical and experimental studies, it has been determined that equilateral triangular notched heater plates positioned in the opposite direction to the flow direction of diesel fuel provide up to 30% better heat transfer performance than unnotched flat plates.

Keywords: Diesel Filter, PTC Heater, Diesel Heating, Heat Transfer Enhancement, Notched Heater Plates.

VALUATION OF EARLY STAGE INCUBATION STARTUPS AND MEASURING THEIR COMMERCIALIZATION POTENTIAL

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ABSTRACT

Early stage startups are considered as high potential investment channels, but their lack of financial data makes their valuation a difficult and frequent problem. The lack of financial data and the difficulty of traceability cause investors to stay away from this area. Incubated startups, on the other hand, stand out as they have more solid foundations in areas such as training, mentoring, business plan validation, intellectual property and financial planning. The purpose of this study is to measure the valuation and commercialization potential of such startups. This study is based on a literature review on startup valuation. Company valuation methods were examined and startup valuation criteria were determined.

The research findings were evaluated using fuzzy logic method and the valuation and commercialization potentials of startups operating in incubation centers between 2022-2023 were measured. The data obtained are compared with the initial investment values of startups after their incorporation. It is found that incubators have a significant impact on the valuation and commercialization potential of early-stage startups and that non-financial data can be used as a reference for the final valuation.

Keywords: Early Stage Startup Valuation, Incubation Center, Commercialization

DETECTION OF TEA AND FERN WITH YOLO ALGORITHMS

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ABSTRACT

When tea leaves are harvested, they may get mixed with various herbs. A reliable and accurate diagnosis and identification system are necessary to prevent and manage such an issue because it is crucial for producing higher quality, healthier, and more flavorful tea. This system can be utilized both in automated tea harvesting systems and at the entrances of tea drying factories. This research aims to provide an AI-based solution for the problem of fern weeds getting mixed into tea leaves, using a dataset consisting of leaves collected from tea gardens and the fern weed most commonly found within. A total of 747 digital images were collected from tea gardens to form the dataset. Subsequently, data augmentation techniques were employed to expand the dataset, resulting in 1395 images. The models were trained based on the augmented dataset. The same dataset was used for training each model. Models trained in two different versions, YOLOv5 and YOLOv8, were evaluated based on their identification results. For the YOLOv5 approach, precision, recall, mean Average Precision (mAP), and F1-score parameters were determined to be %84.4, %81.0, %84.4, and %0.83, respectively. For YOLOv8, the identification results were %86.7, %79.9, %86.7, and %0.83, respectively. Experimental results indicate that the YOLOv8 algorithm demonstrates superior performance in plant detection. This study is expected to help minimize quality and flavor issues by swiftly identifying and detecting weeds mixed into tea and to support future research endeavors.

Keywords: Fern, object detection, tea leaf, YOLO

FABRICATION OF MXENE-BASED HYDROGELS FOR WEARABLE STRAIN SENSOR

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ABSTRACT

The rapidly increasing elderly population and health problems due to lifestyle have reached a point that affects our daily activities. Moreover, technological advancements in the field of health increase expectations for rapid and effective diagnosis and treatment of health problems. The effective solution to these problems is possible through real-time monitoring. Transition metal carbides, nitrides, or carbonitrides, named MXenes, are innovative materials that have attracted attention in recent years as new members of the 2D material family. MXenes are ideal for high-performance wearable sensors due to their high surface-to-volume ratio, high number of active sites, ease of surface functionalization, and integration with devices. Among MXenes, Ti3C2Tx is the most preferred type due to its excellent hydrophilicity, superior electrical conductivity, fast electron transfer ability, flexibility, stable, and durable layered structure. The main purpose of this study was the production of a stable, repeatable and high-strength wearable strain sensor using MXene-based hydrogels, one of today's newest materials.

In this study, Ti3AlC2 powders in the MAX phase prepared with the help of a ball mill were selectively etched to obtain MXene nanomaterial. Nanolayers were obtained using DMSO to increase their properties. The crystal structure and morphological properties of MXenes were examined with the help of XRD and SEM. MXene-based double-network hydrogels were produced and used as wearable strain sensors. Changes in the impedance and capacitance of the sensor under tensile-pressure speeds of 0.5 MPa/s and 1.3±0.3 mm/min were instantly examined with the help of an LCRmeter.

Keywords: Wearable strain sensor, MXene, Hydrogel

DEVELOPING LOGISTICS TREND: THE PHYSICAL INTERNET

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ABSTRACT

One of the latest trends developed to increase the efficiency and sustainability of logistics is the Physical Internet (PI or π). PI offers a sustainable basic solution to traditional logistics systems. This study aims to examine and outline the concept of PI. It builds on the Digital Internet to reshape the real world, where physical objects currently undergo logistics activities (transportation, storage, handling, etc.) in inefficient and unsustainable ways. PI can be defined as an open global logistics system based on physical, digital, and operational connections, aiming for efficiency and sustainability based on economic, environmental, and social components. This system is constantly evolving, driven by technological, infrastructural, and commercial innovations. This concept, which is rapidly developing especially in Europe, is based on the interconnection of logistics networks through standardized cooperation protocols, modular containers, and intelligent interfaces. Advanced collaborative decision support systems, real-time monitoring, advanced forecasting, sharing mechanisms for future transport movements, and integrated information-sharing platforms are required for successful PI applications. PI provides important contributions such as coordination, collaboration, sustainability, security, efficiency, global supply chain, and synchronization.

Keywords: Logistics System, Innovation, Physical Internet

DEVELOPMENT OF AN R PACKAGE FOR ESTIMATION OF RARE VALUES IN IMBALANCED REGRESSION DATA SETS

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ABSTRACT

Imbalance in machine learning is the situation where dependent variable has skewed distribution. In classification, the models are biased in favor of the class with more data. This is called class imbalance and there are many methods proposed to deal with it. Also, Researchers who want to use mentioned methods can use packages prepared in R and Python. However, there are very few studies on imbalanced regression. Additionally, the R and Python packages available to use these recommended methods are very limited. Regression imbalance occurs when the dependent variable has rare values. Regression approaches used in the fields of machine learning and statistics will be biased in favor of correctly predicting data with excess data naturally. In fact, many methods will ignore these values as they are considered outliers. Two main approaches are used in case of imbalanced regression. The first is to directly intervene in the objective function of the regressor by setting the sample weights to be high for rare samples. The second is resampling such as oversampling and undersampling and can be used to balance data by adding and removing samples. This study aims to develop an R package to create an environment where researchers can use the mentioned methods. The package (ImbRegSamp), which is currently under development, includes 7 resampling, 4 performance measures and 2 relevance function methods as of now. Researchers can balance the data set by pre-processing with resampling methods or determine weights using relevance functions to be used in regression. To evaluate the performance of the model they trained, they can use metrics that take into account the rare data given in the package instead of classical metrics. The methods and how they are used in the package are explained with examples in the paper.

Keywords: Regression, machine learning, resampling, rare value estion, imbalanced regression

INSTANTANEOUS and CLOUD-BASED PATIENT FOLLOW-UP DEVICE

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ABSTRACT

This study presents the design and development of a wearable device intended for the continuous measurement of pulse rate, oxygen saturation, body temperature, and blood pressure and the transmission of these measured values to a database. The device has been designed to be worn through the wrist and finger of the user with a cuff and a screen to display the blood pressure measurement, body temperature, and all the values to be measured placed on the wrist and sensors to measure other parameters, which are the pulse rate and oxygen saturation values, placed on the finger. Real-time measurements are monitored on a screen integrated into the device using a microcontroller unit (MCU). These data are also transmitted to a server through the MQTT (Message Queuing Telemetry Transport) protocol, a reliable method for remote monitoring and storing data. The primary objective of this device is to ensure continuous and easy monitoring of vital measurement values and store healthcare data on a server. The device also aims at making things easier for hospital staff by enabling them to easily monitor the vital measurement values of the patients with a single device and get immediate access to the data thanks to the continuous and instantaneous measurements it offers. This is to lighten hospital staff's workload and help them perform patient follow-ups more effectively and be informed of emergencies sooner. Furthermore, it will create a source to monitor and evaluate patients' treatment processes and establish a more accurate development of treatment plans thanks to the device's data collection and storage features. Moreover, patient monitoring will provide us with a dataset. This will pave the way for emergency predictions through artificial intelligence methods following the dataset's reaching a sufficient number.

Keywords: MQTT, Healthcare IoT, Wearable Health Devices

UNDERWATER IMAGE ENHANCEMENT BASED ON YCBCR COLOUR MODEL

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ABSTRACT

There is blur in the images taken underwater and the images are not at the desired clarity. Besides water, mineral, sand, salt, etc. the presence of particles makes it even more difficult to get a clear image. In addition, increasing the depth also causes information losses in the image due to reducing the amount of light. Many image improvement studies have been carried out to reduce the impact of all these negativities and to get a clearer image. Since the colors in the YCbCr format are closer to what the human eye sees, a study has been conducted on image improvement by converting from RGB color space to YCbCr in this study. Because the Y component expresses brightness, it has shades that go from black to white. Therefore, the luminous estimation is made using the Gaussian function on the Y component. Then, transformation and grayscale stretching were performed to make the gray image better. The data set used in the study is the Underwater Image Enhancement Benchmark (UIEB). This data set contains 890 raw underwater images, as well as references corresponding to the images. The PSNR value was calculated as 5,40 on average and the entropy was calculated as 4,56. The success of the new method has been compared with the classical methods. It has been observed that higher performance is achieved in dark images.

Keywords: Image enhancement, color space, underwater image

DISCUSSION OF INNOVATION APPROACH IN THE FRAMEWORK OF INDUSTRIAL DESIGN THROUGH INTELLECTUAL PROPERTY

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ABSTRACT

In this study, the complex interaction between innovation approaches and intellectual property in the field of industrial design will be critically analyzed. In a rapidly developing global environment where competition is fierce and market dynamics are constantly changing, the importance of innovation always comes to the fore. Especially within the framework of design-oriented innovation, industrial design, as an important component of product development, is one of the important elements of innovation efforts by embodying problem-oriented approaches beyond the combination of aesthetics, functionality and user experience.

In this context, the use and management of intellectual property rights are emerging as critical determinants of success and economic sustainability. Many innovative ideas and practices come to the fore as a result of various innovation approaches used in industrial design, ranging from traditional methodologies to contemporary paradigms such as design thinking and user-centered design. It is important that patents, trademarks, copyrights and trade secrets serve as indispensable tools to protect and capitalize on design innovations.

However, there are major differences in meaning and practice between today's industrial design approaches and industrial design registration within the framework of the definition of Industrial Property. These differences especially affect the perception, protection and commercialization of problem-oriented industrial design approaches within the framework of existing definitions. In this context, the research will discuss industrial design approaches and industrial design projects registration criteria and their place in the context of innovation, especially through the student projects of OMU Department of Industrial Design. Within the framework of this discussion, the current status of patent, utility model and industrial design registration concepts in the innovation ecosystem will be analyzed.

Keywords: Industrial Design, Design Oriented Innovation, Intellectual Property

COMPARATIVE ANALYSIS OF GLOBAL ROAD PLANNING ALGORITHMS

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ABSTRACT

Global path planning algorithms are important for a mobile robot to reach the specified destination in an environment with a known map. For these global path planning algorithms, finding the shortest path and finding this path in minimum time are important criteria. In this study, different global path planning algorithms are compared in a pre-mapped environment in ROS environment. A, Dijkstra, Greedy best-first search, Jump point search (JPS), Bidirectional alternating search (BAS), Rapidly exploring random tree (RRT), and Probabilistic roadmap (PRM) algorithms were used for the global path planning algorithm. The paths found by these algorithms are compared in terms of computation time and path length.*

Keywords: Global path planning, ROS, A, Jump point search, PRM*

A RESEARCH ON UNIVERSITY STUDENTS' PERCEPTION OF R&D PROJECTS AND ENTREPRENEURSHIP

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ABSTRACT

This research on university students' level of participation in research and development (R&D) projects and their experiences, expectations and needs related to entrepreneurship reveals various levels of interest and experience from different perspectives. The study was conducted with the participation of 156 associate and undergraduate students in their final year at a state university in Turkey, selected through purposive sampling. The study was conducted with the case study method, one of the qualitative research methods. The data were collected with an interview form prepared by the researchers and consisting of ten open-ended questions. Content analysis was used to analyse the data. The results of the study show that students' participation in R&D projects has positive effects on their career goals. The students who participated in the study thought that they gained various skills and that these skills contributed positively to their professional development, group work and communication skills. Students' R&D project experiences are generally realised within the scope of university student projects; however, some students stated that they could not participate in R&D projects due to time constraints or lack of interest. Regarding entrepreneurship, the majority of students think that it is important to contribute to the entrepreneurship ecosystem. However, a group of students stated that they have no experience or uncertainty about entrepreneurship. Financial support, information and technological resources, training and counselling, social support and motivation are among the resources that students need most to develop their entrepreneurial skills. Students who think that

project experience and entrepreneurship activities will play an important role in their careers after graduation believe that these experiences will have a positive impact on their professional development. Finally, students expect a more active role from their universities in terms of financial and moral support and providing information/resources.

Keywords: R&D projects, entrepreneurship, perception

FLIGHT CONTROL COMPUTER DESIGN AND MANUFACTURING FOR MODEL ROCKETS

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ABSTRACT

Model rocketry is an activity involving the design, construction, and launch of small-scale rockets, typically for hobbies or educational purposes. With the increasing popularity of competitions and festivals, model rocketry activities have become more widespread in our country. To address the reusability of model rockets, there is a need for recovery computers called "flight control computers". Existing systems requiring separate devices for programming have led to increased costs and customs issues, highlighting the necessity for a more ergonomic design and a local system. Within the scope of the project, efforts have been made to design a flight control computer with a dual parachute deployment system. The developed flight control computer for model rockets is capable of altitude measurement, three-dimensional spatial positioning, orientation calculations, and apogee detection. To this end, an electronic board designed around a microcontroller includes pressure and IMU sensors for converting flight data to altitude data, alongside built-in triggering, communication, and positioning systems. In addition to internal programming terminals, the board supports USB cable programming. In line with this, desktop and mobile applications have been developed. Through these interfaces, users can easily adjust parameters, program the system, and use it as a ground station. This user-friendly interface not only facilitates system usage but also appeals to a broad user base.

Keywords: Flight Control Computer, Model Rocket, Avionics

DETAILED ANALYSIS TO DETERMINE THE OPTIMUM FLIGHT PARAMETERS OF SOLID FUEL ROCKETS

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ABSTRACT

Solid fuel rockets play a vital role in modern space exploration and missile technologies. Enhancing their performance and ensuring safe flights are indispensable necessities for space exploration and military strategies. Therefore, determining the optimum flight parameters of rockets holds critical importance in the field of engineering. In this study, detailed analyses were conducted using leading engineering software programs such as OpenRocket, Ansys, and SolidWorks. The OpenRocket software was utilized for the design and performance analysis of rocket geometry. The Ansys software was preferred for aerodynamic, thermal, and structural analyses. SolidWorks software, on the other hand, was chosen for the mechanical design and structural analysis of the rocket. Through the detailed analyses conducted, meticulous attention was paid to critical factors such as the speed, outer diameter, length, nose cone type, fin type, motor thrust, altitude, aerodynamic stability, and payload capacity of solid fuel rockets. It is evident that this study represents a significant milestone in optimizing the flight performance of solid fuel rockets and ensuring safe flights. The results obtained will provide valuable guidance for future research and development in space exploration and missile technologies.

Keywords: Solid fuel rockets, Optimum flight, Missile technologies, Space and aviation

PROCUREMENT METHOD FOR CONTRACTS SIGNED BETWEEN PATENT AGENT FIRMS AND TECHNOLOGY TRANSFER OFFICES WITHIN THE UNIVERSITIES

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ABSTRACT

Technology Transfer Offices (TTOs) may be established either as business enterprises separate from the legal personality of the university, in accordance with Law No. 2547 on Higher Education, or they may be structured within the university as coordination offices or similar administrative units. TTOs established as business enterprises are exempt from the provisions of the State Procurement Law No. 2886 pursuant to Law No. 2547. However, TTOs within the university are subject to public procurement legislation in terms of procurement of goods and services. Consultancy services provided to TTOs by patent agent firms constitute a service procurement transaction under public procurement legislation. Therefore, in order for such procurement to be realized, Public Procurement Law No. 4734 must be applied. The open procedure is the main procurement method according to Law No. 4734. However, in exceptional cases specified in the law, other procurement methods may be applied. Article 22(h) of Law No. 4734 regulates that the direct procurement method may be applied in "service procurement transactions for the registration of intellectual and industrial property rights with national and international organizations." Therefore, the direct procurement method will be applied in service procurements made by TTOs within the university from patent agent firms for registration applications. There is no obligation to sign a contract for all procurement where this method is applied. In terms of signing a contract, according to the 5th paragraph of Article 4 of the Regulation on Procurements Related to Direct Procurement Method, there is an obligation to sign a contract in procurements requiring a certain period for delivery, presentation, or construction. Since patent registration services provided by patent agent firms entail work requiring a specific delivery period, it can be said that signing a contract is mandatory for these procurement transactions.

Keywords: Technology Transfer Offices, Administrative Law, Public Procurement Method, Contracts with Patent Agent Firms.

DESIGN AND DEVELOPMENT OF AN INDUSTRIAL ELECTRONIC STETHOSCOPE

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ABSTRACT

Although more than two centuries have passed since the invention of the stethoscope, this simple instrument is still one of the most important methods of patient examination. The stethoscope transmits bundled sounds from the diaphragm through an elastic tube to the listener by slightly attenuating the sounds. As technology has advanced, electronic stethoscopes have been developed that offer improved features, including noise reduction, sound amplification and the ability to focus on specific frequency ranges. In addition to medical purposes, stethoscopes are now also used in various sectors such as industry or the automotive sector for maintenance or quality control purposes. They can be used during production and maintenance phases to investigate noise problems, such as damaged gears in vehicles or faulty engine blocks, as well as parts such as fans that generate noise when the balance in the industry is disturbed. In industrial stethoscopes, vibrations are often converted into sound data using a long metal rod instead of a diaphragm, mainly because of the noisy environment and the difficulty of localizing vibration sources with sound.

The customizable features of electronic stethoscopes, such as sound amplification, noise reduction, filtering and digital signal processing, highlight their potential for diagnosis and analysis in various fields. This study presents the design of an industrial electronic stethoscope capable of performing data analysis in noisy environments for quality control or fault detection during maintenance. The method includes the mechanical and electronic components of a system that transmits vibration data from the contact point of a metal rod to a piezoelectric sensor integrated with various digital signal processing techniques. This allows the elimination of ambient noise during the analysis of the focused object.

The results of our proposed study for the developed stethoscope, designed for a variety of applications, show the great potential for production quality evaluation and use in maintenance/service processes, especially in the automotive and industrial sectors.

Keywords: Signal processing, electronics, vibration, piezoelectric sensor, electronic stethoscope

OPTIMIZED SIGNAL PROCESSING FOR PREDICTING IMPACT LOCATIONS

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ABSTRACT

An impact or vibration is a mechanical form of energy that propagates from the point where the event occurred to other areas. This propagation process varies depending on the elastic and acoustic properties of the material. Analyzing the impact or vibration and determining the point at which these effects occurred involves the process of analyzing sensor-detected signals to assess the general condition of the tested object by detecting abnormal vibration events. This analysis can be used to identify potential problems in various industries and support efficiency and longevity.

In this study, a method was developed to analyze signals originating from piezoelectric sensors placed at known positions to predict the location of a random impact or vibration on the surface of a plate. This method aims to determine the source of the impact or vibration using various signal processing and machine learning techniques, where the sensors are placed near or far from the source.

The developed method will be evaluated in terms of its ability to detect sources of vibration or damage in the material. It could make an important contribution to the development of systems for monitoring structural health and solving mechanical problems. It is anticipated that the application of this method in industrial and civil engineering could enable early detection of potential problems or damage, leading to minimization of downtime and maintenance costs through proactive measures.

The results of this study show that the proposed method can effectively predict the location of impact or vibration sources on a plate using signal processing and machine learning.

Keywords: Signal processing, piezoelectric sensor, impact detection, electronics, impact location

ECONOMIC ANALYSIS OF A SYSTEM WITH LITHIUM-ION BATTERY ENERGY STORAGE

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ABSTRACT

Nowadays, supply-demand imbalances in electricity, uncertain generation of renewable power plants and irregular load profile are major problems. In order to increase the efficiency of the system and reduce demand charges, the use of energy storage resources has increased. In order to reduce the variability of energy supply in power systems, the market operator tries to incentivize the end-user by offering different price tariffs during the day. When it is not possible for the user to change the time of use of energy, energy arbitrage is an important opportunity. The aim of this study is to analyze the charging and discharging costs of lithium ion battery systems, to create an economically sensitive model with appropriate time and energy management, and to create an economic model by calculating the potential profits from day-ahead market transactions. The energy requirement of the sample enterprise was modeled based on the selected data. In the modeling, incentive situations under different strategies, complex electricity tariffs, load situations and photovoltaic systems were included and analyzed. System Advisor Model (SAM) software was used for the analysis. In the study, no financial gain was achieved under high demand charges. However, in the future, the results of the study can be turned positive by reducing costs as a result of the increase in incentives according to the need, changes in battery size depending on the number of investors and advances in battery technology. In addition, battery storage systems can be considered as an alternative in enterprises with high energy dependency.

Keywords: Battery Systems, Energy, Arbitrage

DEVELOPMENT OF A DIGITAL SIGNAL GENERATOR FOR PIEZOELECTRIC TRANSDUCERS

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ABSTRACT

Piezoelectric materials are widely used materials that can serve as both sensors and actuators due to the complementary piezoelectric and inverse piezoelectric effects they exhibit. Piezoelectric transducers, which are made from materials with piezoelectric properties, are devices that generate or control mechanical vibrations. These transducers utilize the ability of piezoelectric materials to generate mechanical deformations under an electric field.

Piezoelectric transducers are usually powered by an alternating current source and rapidly change their dimensions due to the alternating electric field applied to the material, resulting in an instantaneous mechanical deformation that is perceived as vibration.

Piezoelectric transducers are used in a wide range of applications, from steam generation and seamless bonding of materials to ultrasonic scalpels and cleaning devices based on liquid vibrations. The electronic circuits used to control piezoelectric transducers vary depending on the specifications of the transducer and the intended application.

Key features of piezoelectric transducers include their ability to generate fast and precise vibrations, their low power consumption, their compact size, their insensitivity to electromagnetic interference and their long service life. These characteristics make piezoelectric vibration transducers the preferred choice for many industrial, medical and scientific applications.

The electronic circuits used to drive piezoelectric transducers must be designed based on the resonant frequency of the transducer and the specific application requirements. In this study, an electronic circuit capable of digitally generating the signal required to drive a piezoelectric transducer is developed. In contrast to circuits that generate signals in analogue form and can cause frequency shifts, the results of this study indicate that the developed method will be particularly useful in adjusting the signal frequency for various applications.

Keywords: Signal processing, electronics, signal generator, piezoelectric transducer, vibration

EXPLORING UNIVERSITY STUDENTS' METAPHORICAL UNDERSTANDING OF TECHNOLOGY TRANSFER: A QUALITATIVE STUDY

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ABSTRACT

Technology transfer, the process by which technological innovations are commercialized and made available to third parties, holds significant importance in the Information Age. University students must grasp this concept and its implications. This study aims to examine university students' metaphors regarding technology transfer. Employing a qualitative research approach, specifically phenomenology, the study involved 156 associate and undergraduate students in their final year at a state university in Turkey, selected through purposive sampling. Data were collected using an interview form prepared by the researchers and analyzed through content analysis. Results revealed 80 distinct metaphors generated by the participants, which were categorized into conceptual themes such as "opportunity," "attention," "marketing," "transfer," "cycle," "development," "interest," and "coverage." The most prominent conceptual categories were "transfer" and "development," with the prevalent metaphor being "knowledge." Furthermore, 41 participants were unable to generate metaphors about technology transfer. Based on the identified metaphors, it is recommended to assess interest in technology transfer and associated opportunities for economic and technological advancement.

Keywords: University students, technology transfer, metaphor

CENTRIFUGE-BASED WATER CONTENT DETERMINATION SYSTEM DESIGN FOR GREEN TEA

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ABSTRACT

The design of this project involves selecting the most suitable method for measuring the water content on the surface of green tea leaves and continuing developments based on this method. The chosen design aims to investigate the feasibility of using the centrifugation method to accurately determine the water content in the green tea industry. Within the scope of the project, samples are taken from a specific batch of fresh tea leaves, and the water content is measured using the centrifugation method. This method separates the water in green tea leaves by generating centrifugal force at high speed. By this way, the water content is measured directly. During the project process, parameters such as the rotation speed and duration of the centrifuge will be optimized, and improvements will be made to achieve the best separation efficiency. The project results will provide a valuable resource to the tea industry and contribute to the improvement of the green tea production process. This design will be a reference for indirect water content measurement devices in green tea to confirm the effectiveness.

Keywords: Centrifuge Technique, Circulation Method, Green Tea, Water Content.

DEVELOPMENT OF THE INNOVATION AND ECONOMIC GROWTH CYCLE TOOLBOX

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ABSTRACT

Innovation and commercialization are critical factors for the long-term healthy growth of an economy and providing social benefit. Although this is a process, the process starts with the person who produces the idea, is fed by research and development processes, and goes all the way to commercialization through the outputs. The innovation and commercialization process has a networked, complex, and dynamic context, and at the same time, the experiences in the process are authentic for each person. This is because the skills, knowledge and experiences of the person who initiates the process are different and the process is shaped by personal abilities and decisions. The innovation and commercialization process has efficiency problems. These problems include a lack of sufficient experts in the field of technology transfer, excessive specialization in people, loss of integrity, and inadequate guidance and resources. These problems cause the process to be experienced as a special experience and cause deficiencies and loss of opportunities in the commercialization process. Developed by Yumiko Hamano, the "Innovation and Economic Growth Cycle" addresses every stage at the framework level, from marketing ideas to financing, from the business development process to sustainable growth for individuals and institutions. It also highlights the importance of each step of the innovation and commercialization process and demonstrates that its completion is critical to long-term success. This cycle has limitations in terms

of seeing the details of each step. The role of technology transfer offices in the Innovation and Economic Growth Cycle is to be a facilitator for all stakeholders to eliminate the problems experienced with the loss of the whole. As a result of the studies, surveys, and interviews from the well-being of the person to the birth of the idea in the context of the experience of the person who has the idea within the cycle of innovation and economic growth; The Innovation and Economic Growth Cycle Toolkit was developed as a facilitator by analyzing everything needed in the process, from the projecting of the idea to the commercialization process. We believed thatThe developed tool set willincrease productivity by providing guidance on personal experiences within the innovation and economic growth cycle.

Keywords: Project Management, Entrepreneurship, Commercialization, Technology Transfer Office

A REVIEW OF R&D AND DESIGN CENTER COMPANIES IN TR61 REGION

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ABSTRACT

Research and development, innovation and design activities are a strategic issue in improving the competitiveness of companies. These activities require human, financial resources and other infrastructure resources. Our country's companies are supported by legislation to encourage R&D, innovation and design activities to meet these needs. One such support is the establishment of R&D and design centers to systematically conduct R&D and design activities within companies. The aim of this support is to enable companies to carry out systematic R&D, innovation and design activities in order to strengthen their competitiveness in their existing markets and/or to gain access to new markets.

According to current statistics, there are 1306 R&D centers in 45 industries, 329 design centers in 31 industries, and more than 15,000 ongoing systematic R&D, innovation, and design projects are developing value-added products.

Sustainability is a concept that has been on the world's agenda since 1980, with activities such as conferences, agreements, action plans, and its impact is growing by the day. In the context of global warming and climate change, product development under the framework of sustainability and green transformation with environmental sensitivity, low carbon footprint in the industrial ecosystem contains opportunities for companies in terms of competitiveness. The study examined the related to environmental sustainability products and studies of companies with R&D and design centers in the TR61 region.

The method of qualitative research used in the study was the analysis of the documents. Within the framework of research, there are 20 R&D companies and 1 design center in Antalya, Burdur and Isparta. Within the framework of sustainability, the websites of the R&D and design centers and related websites were examined. With the research, important results have been found within the framework of the companies with R&D and design centers that are located in the TR 61 region.

Keywords: R&D Center, Design Center, Sustainability

A RESEARCH ON COMPANIES PRODUCING TOURISM TECHNOLOGIES IN TECHNOPARKS IN TR61 REGION

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ABSTRACT

Technoparks, established within the framework of the development of technology-based products, are structures that provide services in the research and development of products that can compete in the global market in many sectors in our country. With the services and support provided by Technoparks, companies develop technology-based products through R&D and innovation studies and offer them to various sectors.

Tourism, which is an important service sector for countries in the world, due to generating income and creating employment. The sector, which is considered as the whole of the services that need to be provided in the process of the movement of billions of people around the world, affects many different sectors. Products with new technologies that will reduce costs, increase service quality and satisfaction and contribute to competitiveness in the sector attract attention.

Antalya, Isparta and Burdur provinces are called TR61 region, which is one of the Level II regions. There are 4 Technoparks in the TR61 Region.Three of these 4 Technoparks carry out their activities on the campuses of Akdeniz, Süleyman Demirel and Mehmet Akif Ersoy universities and the other in the Antalya Organized Industrial Zone.

Qualitative research method was used in the study. In this framework, the research examined the areas where the products and technologies developed by the companies operating in 4 Technoparks located in Antalya, Burdur and Isparta are concentrated and which activities of the tourism sector they contribute to. The website ownership status of more than 180 companies in Technoparks was determined. The company websites accessed were examined in detail and the products developed for the tourism sector were evaluated in terms of website content analysis. In terms of the tourism sector and products, important findings were found for the Technoparks companies located in TR 61 Region.

Keywords: Tourism sector, Technoparks, Technology companies, Tourism technologies, TR 61 Region

EXPERIMENTAL INVESTIGATION OF THE USABILITY OF EXISTING INTERNAL COMBUSTION ENGINES WITH HYDROGEN FUEL

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ABSTRACT

With the Industrial Revolution, carbon-based energy sources have had a significant impact on global warming through greenhouse gas emissions over the past approximately two centuries. Especially, the presence of billions of internal combustion engine vehicles using hydrocarbon-based fuels poses a significant risk in terms of global warming. The usability of hydrogen fuel in internal combustion engines is a significant issue. However, the stages of obtaining and storing hydrogen are costly, which limits its use as a fuel. It is considered necessary to produce hydrogen at a cost of $1 per kg to reach the target point. While there are 1.4 billion internal combustion engines in the world, according to TÜİK 2023 statistics, this number is 28,365,819 in Turkey. If these vehicles could be operated with hydrogen as an alternative fuel, the outputs obtained would make significant contributions to the economy, environment, and reducing external dependency. So far, there have been very limited studies on this issue, and it is not considered sufficient for a more economical solution. In the experimental setup we established using hydrogen produced by electrolysis as fuel for the internal combustion single-piston gasoline engine, due to the fact that the thermal energy of hydrogen gas is three times higher than gasoline and its combustion temperature is much lower than gasoline. As result, excessive uncontrolled combustion has been observed, leading to melting at the piston head and distortion of the valves. Studies on other parameters are ongoing.

Keywords: combustion engine, hydrogen fuel, engine parameters

DETECTION OF TYPICAL MOVEMENT PATTERNS IN BABIES TREATED WITH HYPOTHERMIA WITH HYPOXIC

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ABSTRACT

The aim of our study is to determine fidgety, tonus, asymmetry and oral motor movements in babies with hypoxic ischemic encephalopathy and hypothermia by using artificial intelligence through electronic records. Three-minute videos of risky babies were analyzed in terms of F +, tonus, asymmetry and oral motor movements with the computer application developed by engineers specialized in artificial intelligence. GMs Assessment is a valuable tool for clinicians to provide early intervention in babies at risk. During the analysis, the videos were divided into frames and the necessary layers for deep learning were created. The process of labeling fidgety movements, tonus, asymmetry and oral motor movements was carried out by examining these layers and the video completely. Each video was examined for approximately 65-95 minutes, and entries were made to the tagging application. Machine learning has been studied with 24120 data entries on the application. As a result of processing 24120 data, F1 success was determined as 91%. The early detection of babies with high risk of CP and early intervention contribute to the positive development of functional results in babies. Artificial intelligence; It is planned to enable more babies to be evaluated while at the same time saving both cost and time. We have improved an application named as ADA Baby Tracker that is at stores now.

Keywords: Artificial Intelligence, Cerebral Palsy, Healthcare

THE "LIFE ROAD" MOBILE APPLICATION: A NEW PERSPECTIVE ON WILDLIFE CONSERVATION IN TURKEY

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ABSTRACT

"Can Yolu (Life Road)" is a mobile application developed to determine the hotspots of roadkills and other causes of death against wild animals in Turkey. During the design process of the application, the target audience had been set up as the fieldworkers, researchers, academics, birdwatchers and nature photographers. However, after the launch of the application, it took great attention from the many ordinary citizens. This interest helped the application to strengthen its citizen science-based feature. The application had been developed in the frame of the "Raptors Conservation Action" project to determine where the roadkills are concentrated and which other factors cause mortality of the species. The application reached a total 927 downloads in Google Play and App Store and 420 data entries from 50 cities in a year. The lack of such an application has brought a new perspective to nature conservation studies in Turkey. According to results, the most common class was mammals and followed by birds, reptiles and amphibians. Small mammals such as Hedgehog, Red Fox and Beech Marten were the most common victims. Large mammals such as Brown Bear were also recorded during the study. Among bird species, the passerines were the majority of the records. Raptor species, which were the main focus of the study, accounted for only 13.7% of the total bird mortality. Reptiles such as snakes and turtles and amphibians such as frogs were also recorded. While most of the records shared with the application were deaths due to roadkills, deaths due to firearms were also observed. The most records were shared from Çankırı, Ankara, Balıkesir, Çanakkale and Kırklareli provinces. We believe that ensuring the technical continuity of the application and increasing the usage and engagement of it will make a great contribution to the conservation and sustainability of biodiversity in Turkey.

Keywords: Life Road, Wild Animals, Roadkill, Conservation Mobile App

MUTLUSUN MULTIPLE SCLEROSIS PATIENT TRACKING APPLICATION

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ABSTRACT

"MutluSun" aims to take an important step by leveraging the power of technology to facilitate the health monitoring of Multiple Sclerosis (MS) patients. The aim of this study is to develop a user-friendly mobile application that will support the treatment processes of MS patients. "MutluSun" mobile application, developed to facilitate the treatment processes of MS patients and improve their follow-up, was designed using Flutter. The app allows patients to record their symptoms, track their medications, schedule doctor appointments, and track their health data daily. Collecting data about patients' symptoms and response to treatment and sharing this data with healthcare professionals is important to monitor patients' health status and optimize treatment plans. The application development process was carried out using the Flutter framework. Flutter is an open source SDK that allows you to quickly create cross-platform mobile applications. The design of the application was developed iteratively, taking into account user feedback and expert opinions. The "Happy You" application aims to facilitate the daily lives of MS patients and improve their health monitoring. The application allows patients to easily record important information such as their symptoms, medication use, and doctor appointments. The application is committed to keeping users' personal health information securely and protecting their privacy.

This study reveals that the "Happy You" application is an effective tool in managing the treatment processes of MS patients by facilitating their health monitoring. With the use of the application, positive improvements were observed in patients' ability to follow their symptoms and use their medications regularly. These results highlight the importance of using technology effectively to improve the quality of life and health management of MS patients.

Keywords: Multiple Sclerosis, Mobile Application, Flutter

AIMS DATABASE: ARTIFICIAL INTELLIGENCE SUPPORTED MULTIPLE SCLEROSIS DATABASE

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ABSTRACT

"AIMS Database" is an artificial intelligence-supported desktop application developed for tracking and recording the data of Multiple Sclerosis (MS) patients. This study was designed to monitor the health status of MS patients, manage their treatment processes and make predictions about their prognostic processes. The application provides a platform to record patients' clinical data, monitor examination results, track medication use and evaluate symptoms. In the AIMS Database, artificial intelligence algorithms analyze patients' walking, voice and MRI data to help predict response to treatment, predict the course of the disease and recommend individualized treatment plans. AIMS Database offers healthcare professionals a comprehensive database and analysis tool to manage patients' treatment processes more effectively. This application has the potential to contribute to the support of research on MS disease, encouraging the understanding of the disease and the development of treatment methods.

This study shows that AIMS Database is an effective tool for tracking and recording data of Multiple Sclerosis patients. With the use of the application, healthcare professionals can more effectively monitor patients' health conditions, manage treatment processes and create individualized treatment plans. Additionally, with the use of artificial intelligence algorithms, patients' response to treatment can be predicted and the course of the disease becomes predictable. The comprehensive database and analysis tools provided by AIMS Database can also contribute to research on MS disease and enable the development of new treatment methods. As a result, the AIMS Database can help improve the care of MS patients and develop more effective strategies to combat the disease.

Keywords: Multiple Sclerosis, Desktop Application, Artificial Intelligence

ARTIFICIAL INTELLIGENCE-SUPPORTED CV AND JOB AD MATCHING: A GOOD PRACTICE ON JOBSOCİAL

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ABSTRACT

This article explores an up-to-date example of artificial intelligence-supported CV and job ad matching through the platform JobSocial. In traditional job search and recruitment processes, finding suitable candidates and suitable jobs can often be time-consuming and complex. However, with the advancement of artificial intelligence technology, it has become possible to provide a more efficient and effective process for both job seekers and employers. JobSocial is a platform where job seekers upload their CVs and employers post job advertisements. Artificial intelligence algorithms analyze the skill sets and experiences of job seekers to help identify the most compatible candidates with job postings. Similarly, it enables employers to identify candidates that best match the qualifications they require. This article examines how JobSocial's artificial intelligence-supported matching system operates and its impact on users. It also discusses the innovations and advantages that this technology brings to the job search process. Ultimately, platforms like JobSocial can facilitate communication between job seekers and employers, making the recruitment process more efficient and effectively matching suitable candidates with job opportunities.

Keywords: Artificial intelligence, CV matching, Job Advertisement, Recruitment, JobSocial

PATENT PORTFOLIO ANALYSIS in ONDOKUZ MAYIS UNIVERSITY BETWEEN 2018-2023

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ABSTRACT

Nowadays, the important of patents increasing gradually because the importance of economic activities which based on knowledge and technology is increasing. Therefore, university inventions, as one of the main sources of knowledge and technologies, are becoming increasingly important. University patents are usually obtained to protect innovative ideas or inventions developed by faculty members, researchers or students. The aim of this study is to analyze the increasing national/international service inventions within Ondokuz Mayıs University between 2018-2023 and to examine the factors affecting them. In the study, national/international patent applications of Ondokuz Mayıs University before 2018, the current situation of the University's patent portfolio and national/international patent applications between the years which follwing above were analyzed. For patent applications, which gained momentum with the effect of Ondokuz Mayıs University Technology Transfer Office (OMU TTO), which became active in 2018, it was deemed necessary to examine the applications between 2018-2023. The patent portfolio kept within OMU TTO and the national/international patent application and registration information from 2018 to 2023 in the TURKPATENT database were used as the research universe. In addition, the impact of the pandemic process, which was effective in the world and in our country in 2019 and beyond, on the applications was shown and interpreted in the focus of the data and by drawing graphs. The results show an increase of more than 4 times from only 5 national patent applications in 2017 to 22 national patent applications in 2018. If the pandemic effect is taken into account, there was a decline only in 2020 and 202[1,] with 14 and 12 national patents, respectively. While conducting the relevant analysis, it has been seen that the authorization of the University to carry out patent application/registration processes to OMÜ TTO with the decision of the Board of Directors, training/events held within OMÜ TTO, one-to-one invention evaluation interviews, systematic screening of BAP projects within the University in the focus of patentability criteria, outsourced project writing trainings, participation in entrepreneurship courses in the curriculum and providing trainings have been effective in increasing the number of applications.

Keywords: National Patent, International Patent, Service Invention, Effect of Pandemic on Patent Applications

SMART PERSONAL ASSISTANT FOR CHOOSING A UNIVERSITY

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ABSTRACT

Nowadays, choosing a university and major is one of the most important decisions that will shape the future of young people. However, the mass of information, the multitude of options and the difficulty of balancing personal preferences can often leave students and their families undecided.

This study aims to provide students and families with information to guide them to the most appropriate university choice, taking into account their personal abilities, interests, career goals and financial resources. The main purpose of the smart assistant is to help users identify universities that are suitable for their educational and career goals, thus enabling individuals to discover educational environments where they can make the best use of their potential.

The assistant provides students with informative and analytical data not only on university choice, but also on many critical factors such as scholarship opportunities, education programs, campus life, and job placement rates of graduates. Thus, it provides the necessary guidance and support to enable them to make their decision-making process more informed, knowledge-based and self-confident.

As a result, the "University Selection Smart Personal Assistant" project has developed an artificial intelligence-based chatbot that will help young people and families overcome the difficulties they face and take the right steps in their education and career journey. For this purpose, it includes the technologies of understanding and transcribing the questions to be asked (speech recognition and speech to text), creating the answer to the question with an artificial intelligence algorithm through the natural language model, and presenting the answer with text to speech.

The project will be prepared and put into use for Ankara Bilim University in the first phase. In the later stages, it is planned to transform it into a general purpose product that other universities can use.

Keywords: Artificial Intelligence Based Chatbot, Natural Languages Processing, Digital Speech Processing

AN EXAMPLE OF INTEGRATED AND SUSTAINABLE QUALITY ASSURANCE SYSTEM DIGITALISATION IN HIGHER EDUCATION: OMU UNIKYS

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ABSTRACT

Today, digitalisation of quality assurance systems plays an important role for higher education institutions as a requirement of developing technology. The establishment of internal and external assurance systems for quality processes in higher education institutions and the follow-up of systematic monitoring and improvements due to increasing competition have accelerated digital transformation.

The processes for the quality assurance system carried out by Ondokuz Mayıs University have been digitised with the ÜNİKYS software. ÜNİKYS, developed using the Ruby on Rails (RoR) framework, is an integrated and sustainable software designed to carry out the planning, monitoring, evaluation and improvement processes of the activities carried out in the institution through a single application. The ÜNİKYS software, which is designed to meet the accreditation criteria, Turkish Higher Education Quality Council (THEQC) quality measures and TSE Quality Management Systems standards, is aimed to comply with national and international quality standards, especially the quality approach in higher education.

In this study, ÜNİKYS module functions and the compliance of the implementation process with standard quality criteria and system outputs are compared and its effectiveness in administrative processes is examined in detail. ÜNİKYS is used as a model for the digitalisation of integrated and sustainable quality assurance systems in higher education based on practical applications. ÜNİKYS software contributes to higher education institutions to achieve the desired goal in decision-making processes for education and research activities. Managers at all levels of managerial processes are provided with the necessary information and thus effective decision-making is supported.

Keywords: Higher education, quality assurance, quality management system, digitalisation, OMU UNIKYS.

KINEMATIC ANALYSIS AND SIMULATION OF 4 DOF ROBOTIC ARM

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ABSTRACT

Today, there are autonomous robotic arms with the capability of movement in various industries. These robotic arms come in different sizes and can perform a variety of functions. They are increasingly being utilized in tasks such as picking up and placing designated objects, painting, assembly, etc. In order to provide meaningful motion capabilities to robotic arms, it is necessary to guide them to a target point. This study aims to analyze forward and inverse kinematics to determine the position and orientation of the end effector of a 4-degree-of-freedom robotic arm, with joint parameters specified and a kinematic model established. The values obtained from the analysis were tested on our own software platform (PyQt) and a 2D simulation interface. The data obtained from the simulation environment was then used to conduct real-life tests of the robot, where it was observed that it accurately oriented itself towards the target object. The error rates obtained from the tests were discussed.

Keywords: Forward kinematics, inverse kinematics, simulation

A SOFTWARE FOR MEASURING THE ACHIEVEMENT OF EDUCATIONAL PROGRAM OUTCOMES AND EVALUATING FACULTY PERFORMANCE IN UNIVERSITIES

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ABSTRACT

This study presents the design and development of a software for measuring the achievement of educational program outcomes and evaluating faculty performance in universities. The software consists of two main modules: the course introduction module and the measurement and evaluation module. The course introduction module includes the course introduction files uploaded by the faculty member, and these files are scored by the system and reflected in the faculty member's performance if they are uploaded correctly and filled. The measurement and evaluation module is designed for the faculty member to enter exam scores for the courses. The faculty member can manually enter the student's question-based scores into this module, or the system can extract question-based scores from the university's student grading system.

The system calculates each student's learning outcome success for each exam and overall achievement of the learning outcomes of that course using the scores students receive on exam questions, the relationship between questions and learning outcomes, and the contribution rates of exams. It also calculates the level of contribution of all courses to program outcomes by multiplying the ECTS load by the total ECTS load.

The system stores this data for each student separately and allows the level of achievement of program outcomes to be displayed for each student upon graduation. In addition, it scores the faculty members based on their data entry status, evaluates the scoring by the education committee, and considers survey results to determine the faculty member's performance score.

Keywords: Educational program outcomes, faculty performance, evaluation, measurement, software

USE OF TECHNOLOGY IN OUTDOOR EDUCATION: AWAY FROM SOCKETS, OUTSIDE THE CLASSROOM, INSIDE EDUCATION

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ABSTRACT

When looking at the technological equipment that will be included in the process of teaching and learning in the classroom, seeing that tools such as overhead projectors, computers and projections have been used from past to present. These tools are mostly used in courses taught within four walls to save the educational process from monotony. In this study, it is aimed to examine the technological tools used to further activate outdoor education and enrich educational processes. In this sense, it was aimed to reveal the structure of outdoor education that is highly integrated with technology. Within the scope of this research, which was carried out in accordance with the survey study, the literature in the field of outdoor education was examined and it was tried to determine which technological tools were used in the studies carried out in the relevant field. In this sense, it can be seen that technological tools can be included in the process even on the top of a mountain far from sockets. To give examples of these tools; microscope, binocular, soil analyzer, moisture meter, water analyzer, drone, camera, telephone, weather forecasting devices, radio, telescope, hand-held GPS device, air pollution measuring device, tablet and computer are technological materials that can be used outside the classroom. While these materials make education and training processes more interesting for students, they can also provide permanent and effective learning by appealing to different sensory areas. Overall, integrating technology into education outside the classroom can enrich learning, encourage participation and help prepare students for the digitally driven world they will encounter in the future. In particular, the use of these materials by students in outdoor education processes and providing students with experiences will ensure that these experiences are remembered even after years, thus making what has been learned come to life again and again in the mind. Considering the acceleration of technology today and the fact that a new technological tool enters our lives every day, it is predicted that the number of tools that can be used in outdoor education will increase. In this sense, it should be underlined that initiatives should be taken regarding the use of technological equipment in outdoor education processes and that outdoor education processes should be enriched with technological equipment in teaching programs. At the same time, it would be beneficial for teachers to be sensitive about this issue and make the necessary effort to introduce their students to the opportunities offered by technology.

Keywords: Outdoor education, technology, use of technology in outdoor education

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