FACULTY OF ENGINEERING AND ARCHITECTURE

BULLETIN

● FEBRUARY 2025 ●

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FACULTY OF ENGINEERING AND ARCHITECTURE

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NEWS FROM THE FACULTY

● ELECTRICAL AND ELECTRONICS ENGINEERING ●

Dr. Halit Yahya participated as an invited keynote speaker at two conferences held at Mianwali University and Namal University. In his presentations, he delivered his talk titled “Optimized AI for Renewable Energy and Cybersecurity under Advanced Risk Frameworks.”

In his speeches, Dr. Yahya shared important insights on the role of artificial intelligence in enhancing the efficiency of renewable energy systems and AI-based strategies to reduce cybersecurity threats in energy infrastructure.

Additionally, he conducted an interactive discussion session on the impacts of artificial intelligence on daily and future life, addressing the steps that need to be focused on today to keep up with the future.
Dr. Yahya’s participation in these events highlights his global work in the fields of artificial intelligence, energy systems, and cybersecurity, emphasizing the importance of research aimed at shaping a sustainable and secure future.

VISIT TO KAHRAMANMARAŞ, EARTHQUAKE ZONE

Res. Assist. Şeyhmus Can Tunç from the Civil Engineering Department conducted a field visit to Kahramanmaraş, one of the provinces most affected by the February 6 earthquakes and the epicenter of the disaster. During this visit, he observed the impact of the earthquake on the region, assessed the progress of the reconstruction process, and evaluated the post-disaster recovery efforts. In particular, he conducted examinations in the area formerly known as Hayrullah Neighborhood, now renamed Azerbaijan Neighborhood, which suffered severe damage during the earthquake. He closely observed the construction process of buildings built by Azerbaijan and assessed how these efforts contribute to the region's recovery and the normalization of daily life. During his visit, he gathered detailed information on the current situation, newly constructed buildings, and projects. Additionally, he engaged with local officials and field workers to gain insights into the progress and implementation of the recovery efforts.

This visit holds significant importance in understanding the impact of post-disaster recovery initiatives, collecting field data on the reconstruction process, and closely monitoring the ongoing developments in the region.

TUBITAK SUPPORT FOR OUR DEPARTMENT MEMBERS

The project titled "The Effect of Single and Hybrid Nanomaterial Usage on the Mechanical and Durability Performance of Geopolymer Composites and Fractal Crack Characterization with the Aid of Three-Dimensional Tomography", led by our faculty member Assist. Prof. Dr. Hamit ÖZTÜRK and with Assoc. Prof. Dr. Anıl NİŞ as a researcher, has been accepted under the TUBITAK 1002.

The project team also includes external contributors Prof. Dr. Savaş ERDEM and Assist. Prof. Dr. Ezgi GÜRBÜZ from Istanbul University-Cerrahpaşa, who have provided valuable contributions to the study.

This research aims to develop innovative approaches in advanced material technologies and sustainable construction materials by analyzing the effects of single and hybrid nanomaterial additives on the mechanical and durability performance of geopolymer composites. Additionally, a detailed characterization of fractal cracks is planned using three-dimensional tomography technology.

We congratulate our esteemed academics and wish them continued success in their work.

ACADEMIC DELEGATION FROM INDIA VISITED OUR UNIVERSITY

Istanbul Gelisim University hosted a distinguished academic delegation from India as part of its efforts to enhance international academic collaborations. Representatives from SRM University AP, Invertis University, and Unteched Private Limited visited our university to discuss potential academic agreements.

The delegation was welcomed by Assist. Prof. Dr. Sajedeh Norozpour SIGAROODI from the Department of Civil Engineering, Erasmus Program Institutional Coordinator. During their visit, the guests had the opportunity to explore the university's laboratories and gain insights into its scientific infrastructure. They later visited the Faculty of Engineering and Architecture, where they were informed about academic studies and research projects.

This visit marks an important step toward strengthening international collaborations and contributes to expanding our university's global academic network.

KOCAELI METROPOLITAN MUNICIPALITY RECEIVES ROAD CONSTRUCTION SEMINAR

A two-day seminar was organized for engineers and technicians working in Kocaeli Metropolitan Municipality Road Construction, Maintenance and Repair unit. In the training program held on February 13-14, road construction processes, maintenance methods and modern repair techniques were discussed.

In the seminar given by Prof. Dr. Mustafa KARAŞAHİN, a faculty member of our department, theoretical and practical information was shared and current developments in the field of road engineering were conveyed to the participants.

During the event, Prof. Dr. Mustafa KARAŞAHİN expressed the happiness of coming together again with engineers who graduated 27 years and 18 years ago, and stated that he was proud to be together with his past students as colleagues.

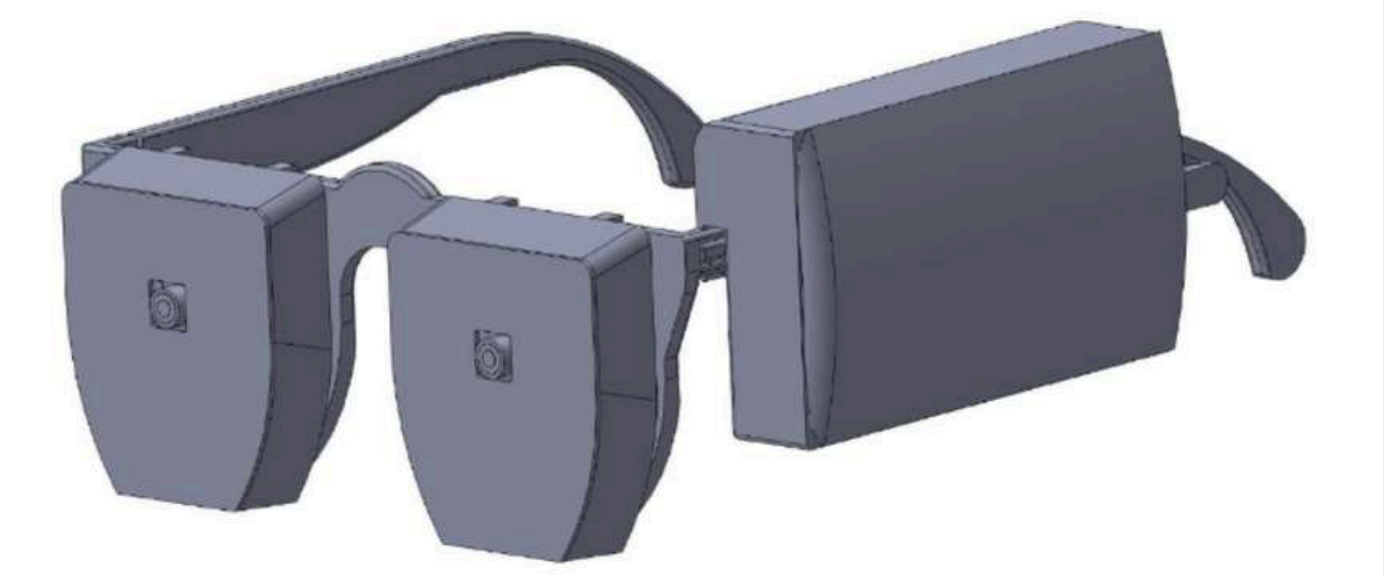
HEC-RAS AND HEC-HMS TRAINING PROGRAM

The Istanbul Gelişim University Continuing Education Center (IGU SEM) is organizing a HEC-RAS and HEC-HMS training program for engineers and students who want to specialize in hydrological and hydraulic modeling.

The training will be delivered by Assist. Prof. Dr. Yasin PAŞA, one of the faculty members of the Civil Engineering Department, and M.sc. Eng. Abdulbaki HACI. The program will last for 10 weeks, with a total duration of 40 hours. It will commence between March 3 – May 5, 2025, and will be conducted entirely online. Participants will receive a certificate upon completion of the program.

● MECHATRONICS ENGINEERING ●

GROUNDBREAKING TECHNOLOGY FOR THE VISUALLY IMPAIRED FROM IGU TTO: SMART GLASSES PROJECT DEVELOPED



Istanbul Gelisim University Technology Transfer Office (IGU TTO) has announced an innovative project that will make life easier for visually impaired individuals. This system, called "Smart Glasses with Artificial Intelligence and Cyber Security Features for Visually Impaired Individuals", has advanced technological features that enable visually impaired individuals to move independently. The project was designed by Furkan Onur, Dr. Lecturer. Prof. Dr. Kenan Şentürk, Dr. Lecturer. Prof. Dr. Serkan Gönen and Research Assistant. Assist. Tunay Acıman developed the project.

The system not only helps the user, but is also supported by cyber security measures. The mobile application allows the user to share information with their immediate surroundings, while prioritizing security with location sharing and emergency support features. The smart glasses undergo regular cyber security audits to ensure reliability.

This innovative system facilitates daily use with its lightweight 3D-printed frame and portable battery. The mobile application, on the other hand, stays in constant communication with the user, offering an experience tailored to personal needs. The voice assistant feature allows visually impaired individuals to interact with the device more easily.

NEWS FROM THE FACULTY

● ARCHITECTURE ●

In an interview with Tv100, Department of Architecture faculty member Dr. İlknur Türkoğlu provided information about the controversial use of the 1500-year-old cistern located next to Hagia Sophia. Türkoğlu explained that the cistern, built during the Byzantine Period, was actually part of the water system used in Istanbul 1500 years ago, but was restored by the tourism business in which the cistern was located in 2022 and converted into a pool-massage salon. Stating that reuse is a method used in the protection of historical structures, Türkoğlu said, "The rules and principles regarding the restoration and re-functioning of historical structures are regulated in our laws. What created controversy about the cistern in question is the wrong and damaging arrangements made without heeding the warnings of the ministry and the municipality. Unfortunately, this structure is not the only example in Istanbul. The structure must be protected in a way that does not disrupt its historical value and structural integrity."

NEWS FROM THE FACULTY

● ARCHITECTURE ●

The master's thesis defense titled "Cezayir Sömürge ve Sömürge Sonrası Mimarlığı" prepared by Architect Muhammed İNAN in Yıldız Technical University, Institute of Science, Department of Architecture, History and Theory of Architecture program was held. Dr. Murat ARAPOĞLU, Prof. Dr. Nuran KARA PİLEHVARİAN and Prof. Dr. Nur URFALIOĞLU participated in the defense jury.

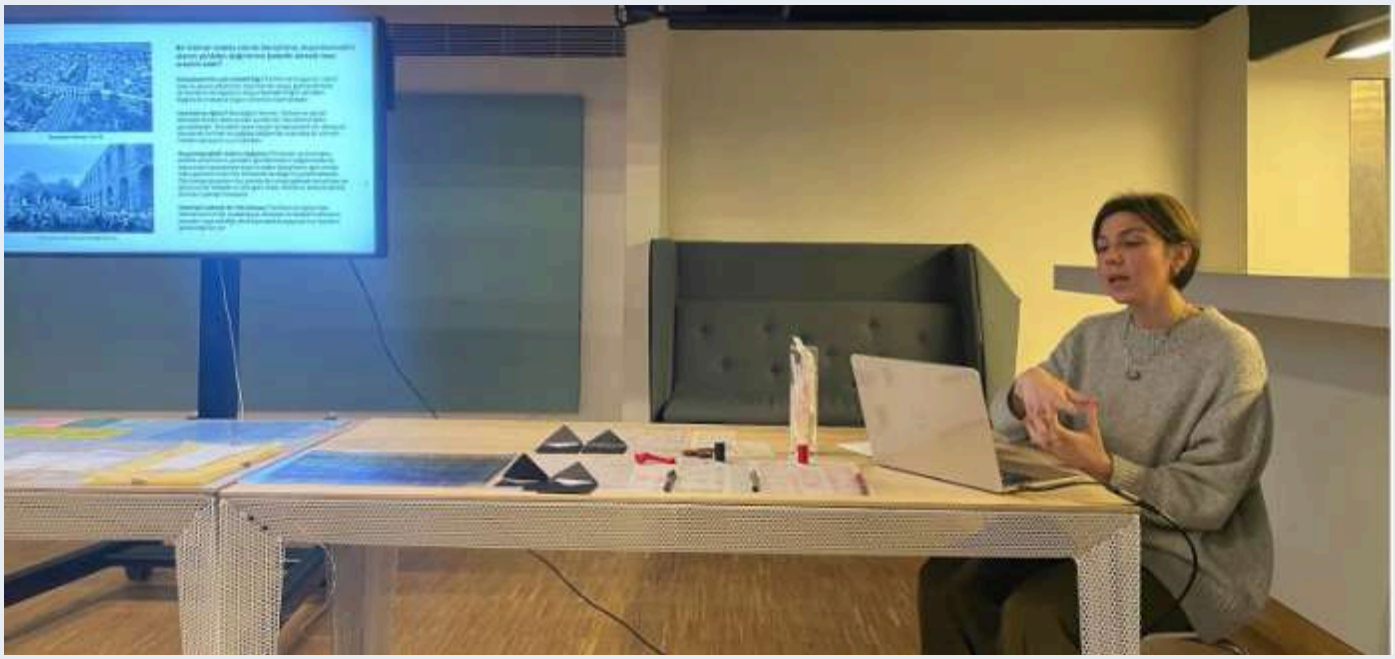
On January 23, 2025, as part of an event organized by the International Student Office, the MMF Architecture Department conducted a demo class for high school students. The session, led by Assoc. Prof. Türkan UZUN and Res. Asst. Hazal TÜRKMEN YAZGAÇ, provided fundamental insights into the field of architecture and introduced inspiring projects that could capture the interest of young participants. During the class, significant projects and design processes of renowned architects from Turkey and around the world were discussed, offering students valuable perspectives on architectural practice. Additionally, the website featuring the diploma projects of fourth-year architecture students was shared with the attendees, allowing them to explore project topics and animations together.

To explore the diploma projects, visit:

https://www.youtube.com/@turkanhocadiplomagrubu5609

NEWS FROM THE FACULTY

● ARCHITECTURE ●



The symposium titled The Mediation of Architecture in the Distribution of the Sensible, organized within the scope of the Aesthetic Phenomenon in Architecture course led by Prof. Ayşe Şentürer in the Istanbul Technical University Architectural Design Doctoral Program, was held on January 29, 2025, at SALT Beyoğlu Kitchen. Participants presented their research, discussions, and theoretical endeavors pursued in response to Jacques Rancière's question, "How does architecture distribute the sensible?" Alongside this research, they shared their trace-following explorations conducted through various urban fragments of Istanbul, presented through the constitutive method of this layered research: "lexicons". Among the symposium participants, Res. Assist. Burcu Korkut's research titled "From Invisibility to Visibility: Liminal Spaces in the (Re)distribution of the Sensible" addressed how the sensible is redistributed through architecture within a context where aesthetic and political fields intertwine. The research also examined the role of liminal spaces in the transformation of the sensible. By analyzing the connections between tectonic elements and the political and aesthetic realms, this research highlighted the poetic and critical potential of architecture, revealing its active role in the distribution of the sensible. The study emphasized that architecture is not merely a practice of spatial production but also a powerful tool that shapes the visibility and invisibility of individuals in society.

NEWS FROM THE FACULTY

● ARCHITECTURE ●

Within the scope of Architectural Design (MIM209-MIM202) and Architectural Design (ARC209-ARC202) Courses, a field trip to Kadıköy Windmill was held and then workshops were held at the Chamber of Architects Kadıköy Representation and Design Workshop Kadıköy (TAK). On Monday, 24.02.2025, within the scope of MIM202-MIM209 Courses, the students of the course and the course instructors Assoc. Prof. İlke Ciritci and Dr. Hilay Atalay made a field trip to Kadıköy Yeldeğirmeni. After the trip, they came together at the Chamber of Architects Kadıköy Representation and discussed the project topic and the analyses made in the field.

On Tuesday, 25.02.2025, students taking the course ARC202 and ARC209 Architectural Design I-II and course instructors Assoc. Prof. İlke Ciritci, Assoc. Prof. Türkan Uzun, Dr. Önder Çelik, Dr. Aytek Alkaya conducted a field study in Kadıköy. Following the trip, a discussion on the project topic and impressions was held at the Design Workshop Kadıköy (TAK).

FACULTY OF ENGINEERING AND ARCHITECTURE

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

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ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● INDUSTRIAL ENGINEERING ●

COMBINATION OF SUSTAINABILITY AND DIGITAL TRANSFORMATION IN INDUSTRIAL ENGINEERING

– RES. ASST. DUYGU TÜYLÜ

Industrial engineering is a discipline shaped by fundamental goals such as process optimization and increasing efficiency. However, today, this field not only reduces costs and increases efficiency; it also takes into account social and environmental responsibilities such as sustainability. Sustainability stands out as an approach that aims to use resources more efficiently by reducing the environmental impact of production and service processes. In this context, digital transformation gives great momentum to industrial engineering.

Digital transformation creates major changes in areas such as process management, production planning, and supply chain management, which are at the center of industrial engineering. Technologies such as artificial intelligence (AI), machine learning (ML), the Internet of Things (IoT), and data analytics are widely used to increase efficiency, reduce error rates, and make processes more flexible. At the same time, these technologies, combined with sustainable production and green technologies, allow environmental impacts to be minimized.

The adoption of sustainable production methods not only protects the environment, but also optimizes the costs of businesses. For example, digital systems that provide energy efficiency provide less energy consumption in production lines, while environmental damage caused by production processes can be minimized with waste management solutions. In this context, digital technologies make sustainability approaches such as green supply chains and circular economy more effective.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● MECHATRONICS ENGINEERING ●

ARTIFICIAL INTELLIGENCE IN MECHATRONICS ENGINEERING – RES. ASST. MUHAMMED LÜTFI TIRABZON

Mechatronics engineering is undergoing a major transformation with the development of robotics and automation systems. In recent years, the integration of artificial intelligence (AI) technologies into robotic systems has revolutionized a wide range of fields from manufacturing to healthcare. AI-enabled robotic systems offer solutions that make human life easier by increasing efficiency and precision.

Artificial Intelligence Supported Robots in Industrial Production

The use of AI in the manufacturing sector is becoming increasingly widespread. Unlike robots that perform specific tasks in traditional production lines, AI-supported robots can make decisions based on environmental factors and optimize processes.

- Smart production lines: Thanks to sensors and image processing technologies, robots play an active role in quality control processes, reducing defective production.

- Automotive industry: Large companies such as Tesla and BMW are using AI-powered robots in their factories, making production processes more efficient.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● MECHATRONICS ENGINEERING ●

Search and Rescue and Autonomous Robot Systems

AI-based robots play a critical role not only in industry but also in disaster management and search and rescue operations. Robots that can perceive their surroundings thanks to sensors and machine learning algorithms can operate in risky areas without the need for human intervention.

- Autonomous reconnaissance robots: After earthquakes and natural disasters, AI-powered robots are used to detect living beings under the rubble.
- Boston Dynamics' Spot robot: This robot is notable for its high mobility in search and rescue operations and military applications.

Surgical Robots in Healthcare

AI-based robots are also bringing great innovations in the healthcare sector. Robotic systems, especially used in surgical operations, increase precision and ensure patient safety.

- Robotic surgical systems: Surgical robots, such as the Da Vinci, are making minimally invasive surgeries safer and more precise.
- AI-enabled diagnostic systems: Image processing algorithms make it possible to detect diseases earlier.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● MECHATRONICS ENGINEERING ●

Future Proliferation of AI-Assisted Robotic Systems

AI-enabled robotic systems are expected to be used in more areas in the future. However, the proliferation of these technologies also raises some ethical and safety issues.

- Data security: AI's ability to collect and analyze data is leading to new debates on privacy issues.

- Labor implications: As automation becomes widespread, some jobs will be replaced by robots, leading to changes in the labor market.

Conclusion: Mechatronics Engineering and Artificial Intelligence

In conclusion, AI-enabled robotic systems have become one of the most important trends in mechatronic engineering. These technologies, which transform many fields from industry to healthcare, create new opportunities for future engineers. The integration of AI and robotics will play a critical role in building a smarter, more efficient and safer world.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● SOFTWARE ENGINEERING ●

THE IMPORTANCE OF BASIC PROGRAMMING COURSES IN SOFTWARE ENGINEERING

Software engineering is a discipline at the heart of innovation in an era of rapidly advancing technology. To succeed in this field, having a strong foundation in programming is essential. Basic programming courses equip software engineering students with skills in algorithmic thinking, problem-solving, and coding, forming the first step in their professional development. These courses are not limited to learning a specific programming language. They teach students concepts such as data structures, algorithms, and logical thinking, which are crucial in software development processes. Additionally, they provide a solid foundation before delving into advanced topics like software development and system design. Fundamental programming knowledge enables students to collaborate on software projects, develop innovative solutions, and adapt to the ever-changing technological landscape. Therefore, basic programming courses hold an indispensable place in software engineering education and lay the groundwork for skills that will be used at every stage of their careers. First-year students of the Basic Programming I course in the Software Engineering Department at Istanbul Gelişim University successfully presented their first projects after an intense learning period. The young software developers showcased their innovative projects at a special event attended by their instructors and industry representatives. Throughout the semester, students utilized the fundamental software engineering concepts they learned to develop creative solutions. The projects primarily featured web applications, mobile solutions, and small AI-based systems. Each team detailed the technical challenges they faced and how they addressed them in their presentations. These projects are significant in showcasing our students' potential and how quickly they can learn. We congratulate them all!

FACULTY OF ENGINEERING AND ARCHITECTURE

ACADEMIC AND SCIENTIFIC ACTIVITIES

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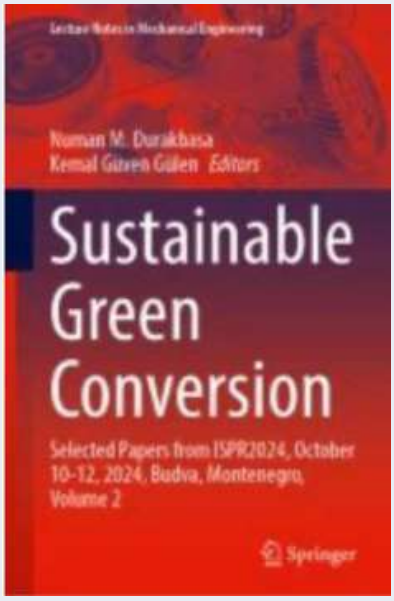
ACADEMIC AND SCIENTIFIC ACTIVITIES

● INDUSTRIAL ENGINEERING ●

The patent of Prof. Dr. Tarık ÇAKAR has been registered. The invention titled "Job Scheduling Device and Algorithm Based on FPGA-Based Hybrid Heuristic Search Algorithms", with application number 2021 022159, which is the invention of Prof. Dr. Tarık ÇAKAR, Deputy Dean of the Faculty of Engineering and Architecture at Istanbul Gelişim University (IGU) and who also works in the Department of Industrial Engineering, has been registered.



The paper titled "Investigating the Effect of Lean Thinking on Employee Motivation in a Business" presented by Asst Prof.Didem Yılmaz, Res. Asst. Duygu Tüylü and Industrial Engineering graduate student Ebru Adıgüzel from Istanbul Gelisim University, Department of Industrial Engineering at the 24th International Symposium for Production Research (ISPR) held on October 10-12, has been approved to be published in the book titled "Sustainable Green Conversion-Selected Papers from ISPR2024, October 10-12, 2024 Budva-Montenegro, Volume 1" published by SpringerNature.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● ELECTRICAL AND ELECTRONICS ENGINEERING ●

Prof. Dr. Bayram Ünal, who works in the Department of Electrical and Electronics Engineering, is the first author of the paper titled 'Influence of temperature and selenium substitution on electrical and dielectric characteristics of CoFe2O4 nanoparticles,' which has been published in the Journal of the Indian Chemical Society, a Q2 quartile journal indexed in SCI-Expanded.

● CIVIL ENGINEERING ●

The conference paper titled "Benchmarking Streamflow Performance of GR4J and TUW Models Using ERA5 and EOBS Data Over Bartın River" prepared by one of our department academic member, Res. Assist. Oğuzhan Murat HALAT was presented in the II. International Texas Congress on Advanced Scientific Research and Innovation.

● ARCHITECTURE ●

Department of Architecture lecturer Dr Oluwagbemiga Paul Agboola's article "Smart Cities and Environmental Sustainability: Evaluating the Nexus in South-West Nigeria" was published in the SCOPUS Index Rated Journal of the Indonesian Journal of Geography in February 2025. The journal has ISSN 2354-9114 (online) and ISSN 0024-9521 (print).
You can access the article from the link below.
https://jurnal.ugm.ac.id/ijg/article/view/93429

ACADEMIC AND SCIENTIFIC ACTIVITIES

● AERONAUTICAL ENGINEERING ●

The book titled "Advances in Physics Research", edited by Dr. Murat Metehan Türkoğlu, an Assistant Professor at the Department of Aeronautical Engineering, Faculty of Engineering and Architecture at Gelişim University, has been published.This book brings together contemporary research in physics, integrating modern theoretical and experimental approaches. It covers a wide range of topics, including coherent elastic neutrino-nucleus scattering and spectroscopic analysis of neurodegenerative diseases. Additionally, the book provides an in-depth examination of innovative subjects such as magnetic field generation methods, random laser systems, and the application areas of low-temperature superconductors. Dr. Murat Metehan Türkoğlu's valuable contribution significantly advances interdisciplinary studies in physics. With its innovative perspective and rigorous approach, this work is expected to serve as a crucial resource for researchers in the field. We sincerely congratulate our esteemed professor on this achievement and wish him continued success in his future endeavors.

The article titled "A Monte Carlo-based approach to determine effective atomic numbers of low-Z explosives in landmines", co-authored by Research Assistant Melis Özşahin Toker from the Department of Aeronautical Engineering, Faculty of Engineering and Architecture at Gelişim University, has been published in the journal Radiation Effects and Defects in Solids. This study presents a Monte Carlo-based approach to determine the effective atomic numbers of low atomic number (low-Z) explosives found in landmines. The method, developed based on Rayleigh and Compton scattering ratios, was tested using the MCNP (Monte Carlo N-Particle) simulation program. The data obtained using a Ge(Li) detector at a scattering angle of 115° demonstrated a strong agreement between the proposed method and experimental results.

The article contributes to nuclear-based detection techniques by providing a more precise and reliable method for analyzing explosives in landmines. This approach has potential applications in various fields, including the defense industry, radiation safety, and medical applications, making a significant contribution to scientific literature.

We sincerely congratulate Research Assistant Melis Özşahin Toker and her team on this successful study and wish them continued success in their future academic endeavors.

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• TAG •

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