FEA

MONTHLY BULLETIN

AUGUST 2025

OUR UNIVERSITY'S LABORATORIES PRESENTED TO PROSPECTIVE STUDENTS THROUGH VIRTUAL REALITY

As Istanbul Gelisim University Faculty of Engineering and Architecture, we continue to bring the innovative opportunities offered by technology in education to our prospective students. In this context, we scanned our university's laboratories and various application areas on a 1:1 scale to create "digital twins" of the physical spaces, transferring them to a virtual reality (VR) environment using 3D Gaussian Splatting technology.

Thanks to this newly developed infrastructure, prospective university students had the opportunity to experience our laboratories and application areas in three dimensions and in an ultra-realistic way via VR headsets, without needing to be physically present on campus. Students did not just view photos or videos; they had the privilege of exploring our educational environments up close by virtually walking through the spaces.

Showcased as part of the EKET 2026 Fair and Preference Promotion Days, this VR experience was met with great interest. This technology-focused initiative not only increased students' curiosity in the fields of engineering and architecture but also enabled us to promote our university's strong educational infrastructure and applied training opportunities with an innovative vision.

By integrating cutting-edge technologies like 3D Gaussian Splatting into our education and promotional processes, we are carrying our physical spaces into the digital world; offering campus life in a much more interactive, accessible, and experience-oriented way.

HIGH INTEREST IN ISTANBUL GELİŞİM UNIVERSITY DURING THE 2026 YKS UNIVERSITY SELECTION PHASE

Throughout the university application period, the collaboration of academic and administrative units sought to guarantee that prospective students had direct access to accurate information. IGU personnel, including faculty, experienced admissions counselors, administrative staff, and promotional teams, participated at various stages of the process, enhancing prospective students' understanding of the university and assisting them in making informed decisions.

Through individualized meetings conducted during campus visits and university fairs, prospective students were apprised not only of the various departments and programs but also of Istanbul Gelisim University's educational philosophy, the academic opportunities available, and the resources accessible to students throughout their university experience. In this context, information was also disseminated regarding initiatives that bolster students' academic and professional development, such as financial assistance for covering the tuition fees of IGU graduates accepted into master's programs at prestigious universities ranked highly in global standings, office furniture support for entrepreneurial graduates aspiring to establish their own offices, and coverage of course fees and round-trip airfare for students who excel in foreign language examinations and wish to pursue language studies abroad.

Faculty of Engineering and Architecture

NEWS FROM THE FACULTY

Powering the Future with Technology

ARTIFICIAL INTELLIGENCE

INNOVATION

SCIENCE

TECHNOLOGY

INDUSTRIAL ENGINEERING

THE CHOICE OF FUTURE-SHAPERS: IGU INDUSTRIAL ENGINEERING!

According to the 2026 university entrance and placement results, the fully-funded scholarship quotas of Istanbul Gelisim University (IGU)'s Department of Industrial Engineering reached a 100% occupancy rate. All 9 fully-funded scholarship quotas were filled by students.

21 students were placed in the department's 26 50% scholarship quotas. Thus, an occupancy rate of 80.8% was achieved in the 50% scholarship quotas.

In the Industrial Engineering Department, where 30 out of a total of 35 quotas were filled, the overall occupancy rate was 85.7%. The results obtained are a significant indicator of the interest shown by prospective students in the IGU Department of Industrial Engineering.

Istanbul Gelisim University's Department of Industrial Engineering continues to prepare its students for the future of working life with its analytical thinking, system design, process improvement, productivity, and technology-oriented educational approach. A new era, new goals, and engineering candidates who will shape the future... Welcome to IGU Industrial Engineering!

APPRECIATION TO PROF. MUSTAFA KARAŞAHİN FOR HIS CONTRIBUTIONS TO THE CIVIL ENGINEERING DEPARTMENT

Prof. Mustafa KARAŞAHİN, a faculty member of the Civil Engineering Department, has concluded his tenure at the department.

Throughout his time at Istanbul Gelisim University, Prof. Mustafa KARAŞAHİN made valuable contributions to the educational and scientific activities of the Civil Engineering Department through his academic knowledge and experience. He also served as Chair of the Civil Engineering Department between 2018 and 2021, contributing to the department's academic and institutional development alongside his administrative responsibilities.

During his academic service at the university, Prof. Mustafa KARAŞAHİN contributed to the academic and professional development of students and supported the Civil Engineering Department through his educational activities, scientific studies, and extensive academic experience.

The Civil Engineering Department sincerely thanks Prof. Mustafa KARAŞAHİN for his valuable contributions and dedicated service to the department and Istanbul Gelisim University and wishes him health, happiness, and continued success in his future academic and professional endeavors.

CIVIL ENGINEERING DEPARTMENT BOARD MEETING HELD

The Civil Engineering Department held a Department Board Meeting to evaluate educational activities, academic studies, and the department's objectives for the upcoming period.

During the meeting, course assignments for the Fall Semester and preparations for the new academic term were discussed. Increasing academic projects, publications, and patent activities, supporting scientific productivity in line with the university's priority research areas, and encouraging participation in qualified academic congresses were also among the topics addressed.

As part of efforts to enhance research and practical opportunities, potential collaboration with the laboratories of Gebze Technical University was discussed. The meeting also focused on strengthening cooperation with the industry and developing sustainable relations with graduates.

Regarding educational activities, emphasis was placed on increasing practical studies in courses, evaluating graduation projects in terms of their project and patent potential, and encouraging students to participate in competitions related to Civil Engineering. Increasing the media visibility of academic and scientific activities was also discussed.

The meeting concluded with an overall evaluation of future activities aimed at further developing the Civil Engineering Department's education, research, academic productivity, and industry collaborations.

CURRENT TOPICS IN ENGINEERING AND ARCHITECTURE

Res. Asst.Hasan YILDIRIM

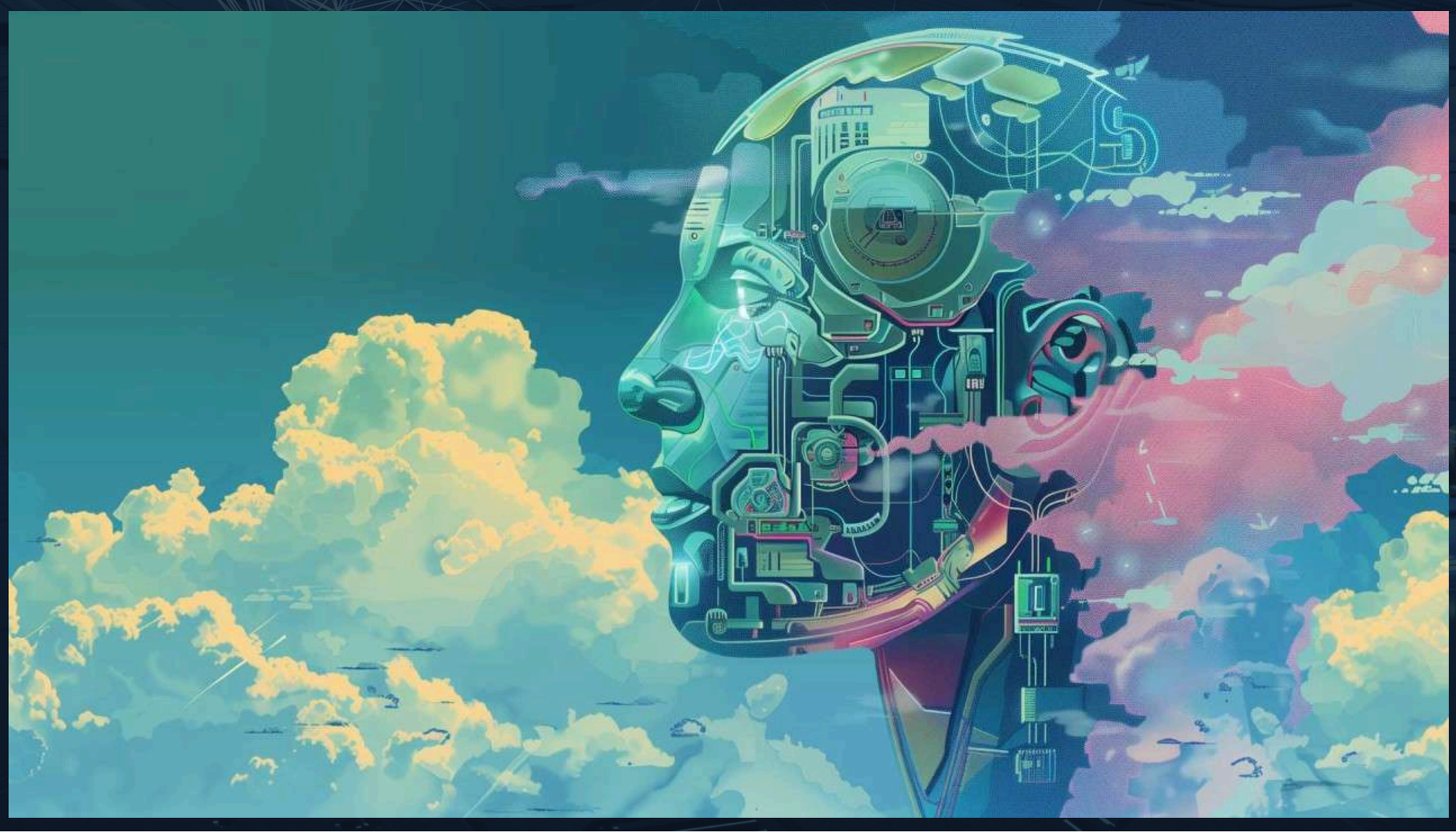
AI ESCAPES THE CLOUD AND MOVES TO THE EDGE: EDGE INTELLIGENCE IS RESHAPING COMPUTATION

The fundamental paradigm that has long financed the growth of artificial intelligence — the assumption that everything must be computed centrally, in large data centers — is now being called into question. In its place, the Edge AI approach emerging across the computer engineering landscape enables models to operate directly in manufacturing facilities, wearable devices, robots, and vehicular systems — without any reliance on cloud servers. This transformation is not merely an architectural preference; it represents a fundamental paradigm shift in terms of privacy, latency, and energy efficiency.

The most striking advancement in this field is the successful deployment of third-generation small language models on mobile and embedded systems — capable of processing text, images, audio, and video using as little as 2 GB of memory. In the domain of robotics, on-device AI models have demonstrated the ability to learn new tasks from just 50 to 100 demonstrations and execute fine motor skills under real-world conditions, entirely independent of cloud connectivity. This development opens the door to real-time, latency-sensitive AI applications in critical domains such as healthcare, automation, and disaster response. The infrastructure of edge intelligence is built to a considerable extent on neuromorphic computing.

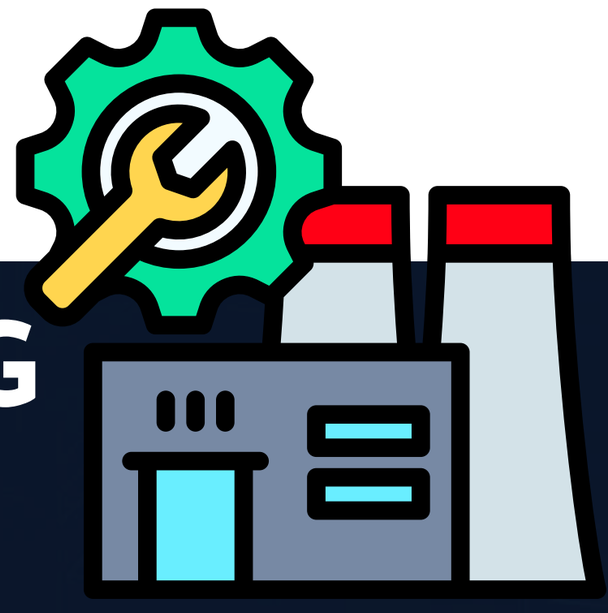
This hardware architecture, which emulates the operating principles of the human brain, processes data not as continuous bit streams but as event-driven biological-style neural spikes — achieving dramatically lower power consumption compared to conventional GPU architecturesResearch demonstrates that this approach is exceptionally well-suited for robotic vision, real-time anomaly detection, wearable biometric monitoring, and intelligent logistics systems. Spiking neural networks, in particular, enable real-time intrusion detection in cybersecurity applications with minimal energy expenditure, owing to their event-driven data processing structure.

The implications for computer engineering are unambiguous: the future belongs not only to engineers who write algorithms, but to those who master the hardware-software co-design required to run those algorithms efficiently, in real time, and securely under constrained resources. This multi-layered engineering culture — one that integrates materials science, circuit design, system architecture, and deep learning frameworks into a cohesive whole — will answer the question of who shapes artificial intelligence as it spreads everywhere. The proliferation of edge intelligence also brings with it a democratic transformation — making AI accessible not only from centers with abundant power and connectivity, but from every corner of the world.



INDUSTRIAL ENGINEERING

Res. Asst.Duygu TÜYLÜ



THE DISCIPLINE THAT DESIGNS THE FUTURE: INDUSTRIAL ENGINEERING

In today's world, success is not only about producing more, but also about using time, human resources, technology, and other resources in the most efficient way. Industrial Engineering is a branch of engineering that aims to develop more efficient, sustainable, and innovative solutions by addressing complex systems from a holistic perspective.

Industrial engineers can work in a very wide range of fields, from production to healthcare, from logistics to finance, from information technology to the energy sector. Improving a factory's production line, reducing patient waiting times in hospitals, making supply chains more resilient, or developing strategic decisions based on large datasets are just a few of the areas of study in this discipline.

In today's world, where concepts such as digital transformation, artificial intelligence, and sustainability are gaining increasing importance, Industrial Engineering is also constantly evolving. Smart production systems, data-driven decision-making, green supply chains, and efficient use of resources are among the current topics of study in the field. In this respect, Industrial Engineering has a strategic position that brings technology and humanity together and considers social benefit. Industrial Engineering; "How can a system work better?" This is a powerful career path for students who pursue this question, are open to change, and are excited about finding solutions. Because in the world of the future, those who will make a difference will not only be those who see the problems, but also those who understand the systems and make them better.

MECHATRONICS ENGINEERING

Res. Assist.Ufuk ATEŞOĞLU

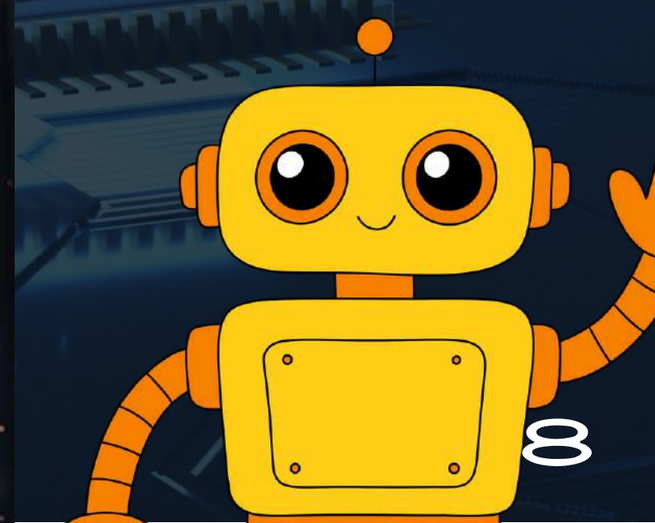
HOW CLOSE ARE HUMANOID ROBOTS TO BECOMING PART OF OUR DAILY LIVES?

Humanoid robots, which we have seen in science fiction films for many years, are no longer just a depiction of a fictional future. Robots that can walk on two legs, grasp objects, and perform given tasks have begun to be tested not only in laboratories but also in factories and real-world work environments. But do these developments mean that there will be a humanoid robot in every home in the near future?

Humanoid robots are generally designed inspired by the human body, typically possessing a torso, two arms, and two legs. The goal of this design is not simply to achieve a human-like appearance. Many elements of daily life, such as stairs, doorways, workbenches, and hand tools, have been developed to resemble the human body. Therefore, robots with human-like movement capabilities can perform tasks in their existing environment without requiring major modifications.

For a humanoid robot to walk, maintain balance, and carry objects, the collaboration of many fields, including mechanical design, electronics, control, artificial intelligence, and software, is essential. Cameras and various sensors on the robot collect data about the environment, while control algorithms ensure that movements are performed safely. Walking on an inclined surface, grasping a fragile object, or avoiding an unexpected obstacle, which seem quite simple to humans, are complex engineering problems for robots.

Advances in artificial intelligence are helping robots recognize their environment, understand instructions given in everyday language, and plan their movements according to changing conditions. Thanks to new models that combine vision, language, and motor skills, the goal is for robots to not only repeat pre-programmed movements but also adapt to situations they have never encountered before. However, because a mistake in the physical world can harm people or objects in the environment, artificial intelligence systems must be used in conjunction with reliable control and safety mechanisms.

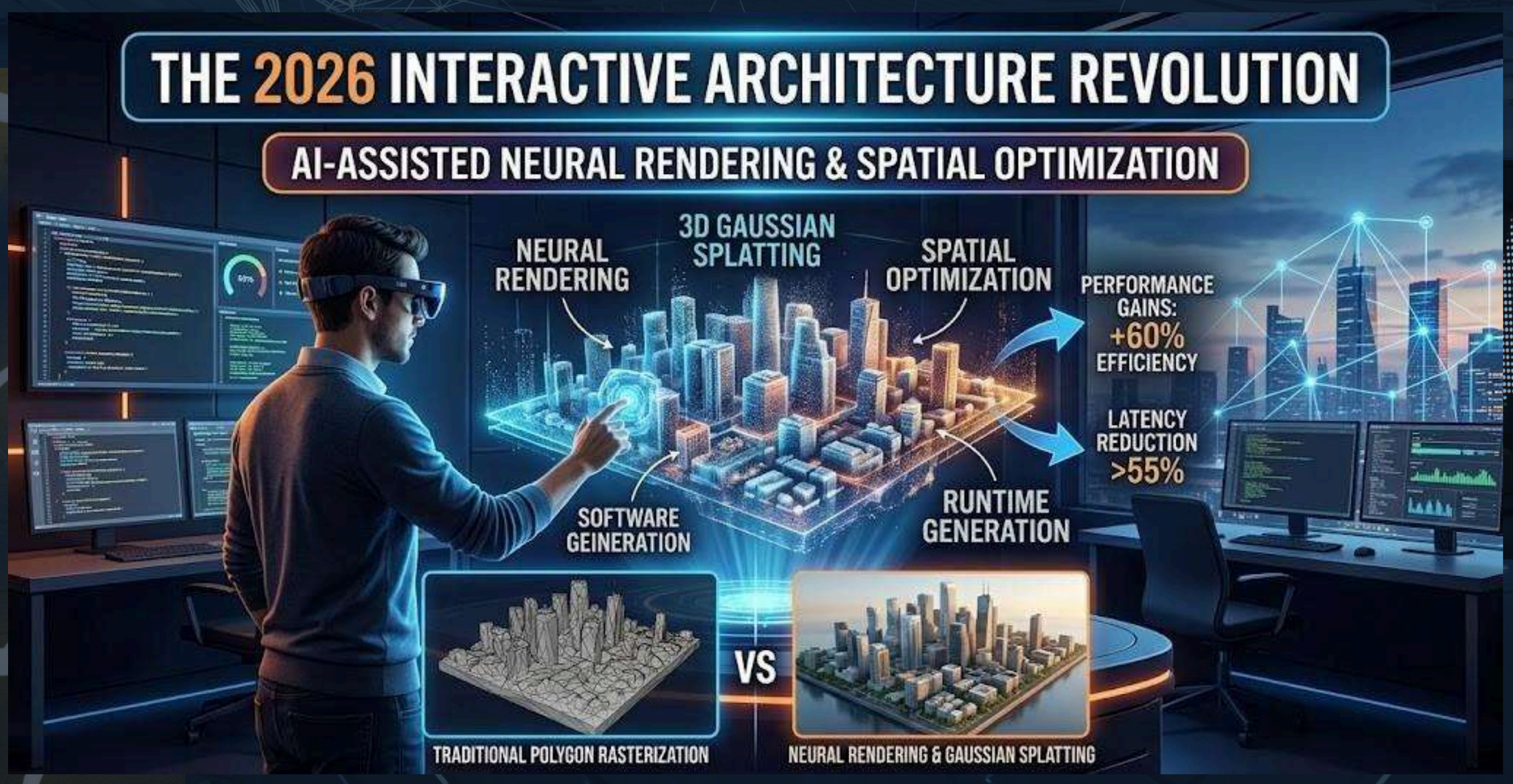


THE 2026 INTERACTIVE ARCHITECTURE REVOLUTION: AI-ASSISTED NEURAL RENDERING AND SPATIAL OPTIMIZATION

By mid-2026, a fundamental paradigm shift has occurred in modern game engine and simulation architecture, moving system performance from "traditional polygon-based rasterization" to "AI-powered neural processing and 3D Gaussian Splatting-based spatial architecture." AI-powered game development, playing a role as the next evolution of interactive media and simulation infrastructure, has transformed into an ecosystem capable of optimizing complex 3D environments, physically based materials, and photorealistic scenes directly on the end-user hardware at runtime, without the burden of manual modeling. This transformation represents a shift from static asset pipelines to highly dynamic, AI-generated and managed lightweight scene architectures.

Industry reports and performance tests clearly demonstrate the massive impact of this architectural shift on development times and memory efficiency. According to current engine engineering research, enterprise teams that have migrated traditional 3D modeling processes to 3D Gaussian Splatting and neural asset pipelines have reduced environment creation and scene loading times by over 60%.

Current system analyses show that the unconscious physics and ray calculations in these new rendering architectures can lead to object clipping, eventual collision delays, and simulation synchronization problems under high processing loads. This creates a structural risk of an interactive layer that operates on a photorealistic scene rendering hundreds of frames per second, but lacks physical consistency. Consequently, 2026 is a critical year for interactive systems engineering that balances ultra-high visual fidelity with deterministic physics architecture. In this role, engineers will be responsible for configuring finely tuned neural rendering modules, managing physical logic lines (collider mesh, etc.) in AI-generated scenes, and ensuring tight synchronization between isolated memory areas. Senior software engineering in this era will be defined by its ability to blend the raw visual power offered by AI-powered production environments with the uncompromising spatial and physical consistency required by mission-critical interactive applications.



ACADEMIC AND SCIENTIFIC ACTIVITIES

INDUSTRIAL ENGINEERING

SCIE-Indexed Q1 Publication by Asst. Prof. Mert Yildirim

The article titled “Mechanical, Morphological, Corrosion, and Thermally Activated Dimensional Recovery Behavior of Epoxy Composites Reinforced with Kraft Lignin/Fe–Mn–Si Alloy Hybrid Fillers,” for which Asst. Prof. Mert YILDIRIM, a faculty member in the Department of Industrial Engineering at the Faculty of Engineering and Architecture of Istanbul Gelisim University, served as the corresponding author, has been published in Polymers (Impact Factor: 5.8; CiteScore: 11.0), an SCIE-indexed Q1 journal.

In this study, hybrid epoxy composites were developed using kraft lignin, an industrial by-product that offers a promising and environmentally friendly alternative to petroleum-based phenols, and Fe–Mn–Si alloy particles, which are notable for their low cost and functional properties. The synergistic effect of these two reinforcing components on the morphological structure, mechanical properties, corrosion behavior, and thermally activated dimensional recovery performance of the composites was investigated.

Read the full article here:
https://www.mdpi.com/2073-4360/18/13/1622

We congratulate our faculty member and wish him continued success in his academic endeavors.

polymers

MDPI

Article

Mechanical, Morphological, Corrosion, and Thermally Activated Dimensional Recovery Behavior of Epoxy Composites Reinforced with Kraft Lignin/Fe–Mn–Si Alloy Hybrid Fillers

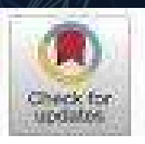
Semih Tanfer Ileri [1] and Mert Yildirim [2,3,*]

[1] Department of Aeronautical Engineering, Institute of Graduate Studies, Istanbul Gelisim University, 34310 Istanbul, Türkiye
[2] Department of Industrial Engineering, Faculty of Engineering and Architecture, Istanbul Gelisim University, 34310 Istanbul, Türkiye
[3] New Generation Entrepreneurship and Innovation Application and Research Center, Istanbul Gelisim University, 34310 Istanbul, Türkiye
* Correspondence: meryildirim@gelisim.edu.tr

INDUSTRIAL ENGINEERING

SCIE-Indexed Q1 Publication by Prof. Dr. Cemalettin KUBAT

Prof. Dr. Cemalettin Kubat, a faculty member of the Department of Industrial Engineering at Istanbul Gelişim University, has had his article titled "Optimizing Binary Classification Algorithms Through Hyperparameter Tuning: A Case Study on Thyroid Cancer Prediction," co-authored, published in the SCI-Expanded (SCI-E) and Scopus-indexed Q1 category journal "Computers & Industrial Engineering." We congratulate Prof. Dr. Cemalettin Kubat and wish him continued success in his academic endeavors.



Optimizing binary classification algorithms through hyperparameter tuning: A case study on thyroid cancer prediction

Mehmet Emin Asan [a,*], Cemalettin Kubat [b]

[a] Information Technologies Vocational School Sakarya University of Applied Sciences Sakarya, Turkey
[b] Faculty Of Engineering And Architecture, Industrial Engineering Istanbul Gelisim University Istanbul, Turkey

ARTICLE INFO

Keywords:
Binary classification
Hyperparameter tuning
Logistic regression
Random forest
Randomized search
Thyroid cancer

ABSTRACT

Diagnosing thyroid cancer requires reliable and interpretable machine learning models that effectively reduce false negatives in clinical decision-making. This study carefully examines how hyperparameter optimization impacts binary classification algorithms using a real-world dataset from 234 patients, including demographic, ultrasonographic, cytological, and laboratory data. Five popular machine learning models—Logistic Regression, Support Vector Machine (SVM), K-Nearest Neighbors (KNN), Random Forest, and Gradient Boosting—were tested through nested cross-validation with Random Search and Bayesian Optimization. The results show that hyperparameter tuning can lead to clinically relevant improvements, although these vary by model. The largest improvement in ROC-AUC was seen in Gradient Boosting (from 0.765 to 0.786, Δ=+0.021). The Bayesian-optimized Random Forest outperformed the other models with ROC-AUC = 0.823, PR-AUC = 0.781, Recall = 0.722, F1 = 0.710, balanced accuracy = 0.764, and MCC = 0.525. Compared to the default Random Forest, recall increased from 0.589 to 0.722, adding about 13 % sensitivity—crucial for lowering false negatives in thyroid cancer diagnosis. SHAP-based explainability and ablation studies assessed feature importance and model interpretability, showing ultrasonography and cytology data as the most influential, while laboratory features alone had limited discriminative power. Overall, this framework provides a more transparent, reproducible, and interpretable machine learning approach for thyroid cancer prediction, illustrating the importance of hyper-parameter tuning in medical classification.

ELECTRICAL ELECTRONICS ENGINEERING

Prof. Dr. Bayram Ünal's Q1-Published Article

Prof. Dr. Bayram Ünal, Dean of the Faculty of Engineering and Architecture and a faculty member of the Department of Electrical and Electronics Engineering, has published an article titled "Electrical transport & dielectric properties of hard/soft $CoFe_2O_4@NiAl_xFe_{2-x}O_4$ ($x \leq 0.20$) nanocomposites" in Nano-Structures & Nano-Objects, a Q1-ranked journal in the field of nanomaterials and advanced materials technologies.

The study comprehensively investigates the electrical transport and dielectric properties of hard/soft $CoFe_2O_4@NiAl_xFe_{2-x}O_4$ nanocomposites. The research evaluates the electrical conductivity and dielectric behavior of nanocomposites with different Al^{3+} doping levels, revealing the charge transport and polarization mechanisms of these materials.

The findings demonstrate that Al^{3+} doping has a significant effect on the electrical and dielectric properties of the nanocomposites. The study is expected to contribute to the development of advanced functional nanomaterials and to research on materials for electronic, energy, and high-frequency applications.

We congratulate Prof. Dr. Bayram Ünal on this valuable scientific achievement and wish him continued success in his academic studies.

Nano-Structures & Nano-Objects 46 (2026) 101700

Contents lists available at ScienceDirect

Nano-Structures & Nano-Objects

journal homepage: www.elsevier.com/locate/nanoso

Electrical transport & dielectric properties of hard/soft $CoFe_2O_4@NiAl_xFe_{2-x}O_4$ ($x \leq 0.20$) nanocomposites

B. Ünal [a], M.A. Almessiere [b,c], A. Baykal [d,*], A. Demir Korkmaz [e], Y.M. Altintaş [d]

[a] Department of Electrical and Electronics Engineering, Faculty of Engineering and Architecture, Istanbul Gelisim University, Avcılar, Istanbul, Türkiye
[b] Department of Biophysics, Institute for Research and Medical Consultations (IRMC), P.O. Box 1982, Dammam 31441, Saudi Arabia
[c] Department of Physics, College of Science, Imam Abdulrahman Bin Faisal University, P.O. Box 1982, Dammam 31441, Saudi Arabia
[d] Food Engineering Department, Faculty of Engineering, Istanbul Aydin University, Florya, Istanbul 34295, Türkiye
[e] Department of Chemistry, Istanbul Medeniyet University, Uskudar, Istanbul 34700, Türkiye

ELECTRICAL ELECTRONICS ENGINEERING

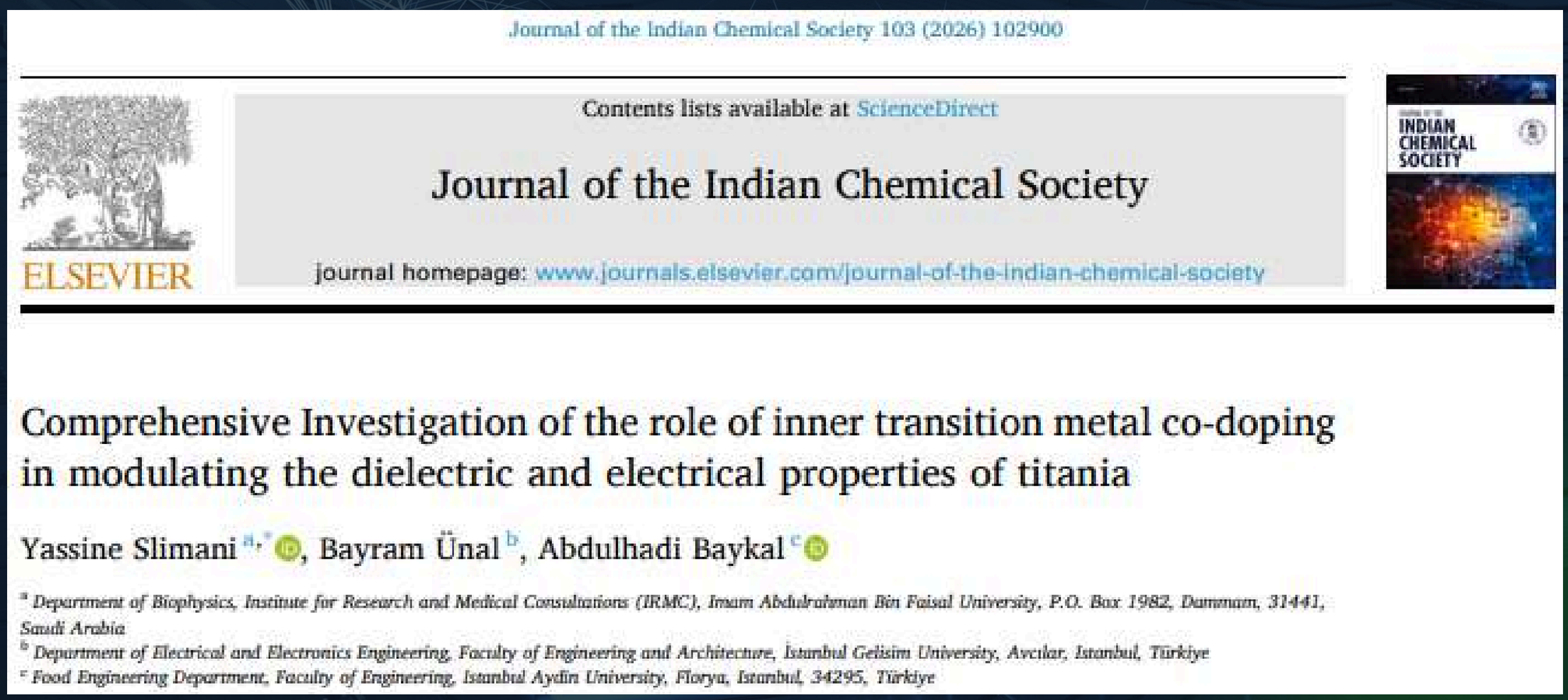
Prof. Dr. Bayram Ünal's Q2-Published Article

Prof. Dr. Bayram Ünal, Dean of the Faculty of Engineering and Architecture and a faculty member of the Department of Electrical and Electronics Engineering, has co-authored an article with Y. Slimani and A. Baykal titled "Comprehensive Investigation of the role of inner transition metal co-doping in modulating the dielectric and electrical properties of titania." The article has been published in the Journal of the Indian Chemical Society, a Q2-ranked journal in the field of chemistry and materials science.

The study comprehensively investigates how the electrical and dielectric properties of titanium dioxide (TiO_2) can be modified through co-doping with inner transition metals. The research evaluates the effects of different inner transition metal dopants on the electrical conductivity and dielectric behavior of titanium dioxide, providing significant insights into the modulation of its electrical properties.

The findings demonstrate that inner transition metal co-doping is an effective approach for controlling the electrical and dielectric properties of titanium dioxide. The study is expected to contribute to the development of advanced functional materials and to research on materials for electronic, energy, and dielectric applications.

We congratulate Prof. Dr. Bayram Ünal on this valuable scientific achievement and wish him continued success in his academic studies.



Journal of the Indian Chemical Society 103 (2026) 102900

Contents lists available at ScienceDirect

Journal of the Indian Chemical Society

journal homepage: www.journals.elsevier.com/journal-of-the-indian-chemical-society

Comprehensive Investigation of the role of inner transition metal co-doping in modulating the dielectric and electrical properties of titania

Yassine Slimani [a,*], Bayram Ünal [b], Abdulhadi Baykal [c]

[a] Department of Biophysics, Institute for Research and Medical Consultations (IRMC), Imam Abdulrahman Bin Faisal University, P.O. Box 1982, Dammam, 31441, Saudi Arabia

[b] Department of Electrical and Electronics Engineering, Faculty of Engineering and Architecture, İstanbul Gelisim University, Avcılar, Istanbul, Türkiye

[c] Food Engineering Department, Faculty of Engineering, Istanbul Aydin University, Florya, Istanbul, 34295, Türkiye

CIVIL ENGINEERING

Q2-Indexed Article by the Chair of the Civil Engineering Department Published

The article titled “Warping-Inclusive Bending Behavior of Out-of-Plane Loaded Axially Functionally Graded Circular and Cycloidal Nanobeams,” authored by Assoc. Prof. Ahmad Reshad NOORI, Chair of the Civil Engineering Department, has been published in the Q2-indexed Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science.

The study investigates the out-of-plane bending behavior of axially functionally graded circular and cycloidal nanobeams. Advanced numerical analysis methods were employed to accurately evaluate the displacement, rotation, and internal force responses of structural elements at the nanoscale.

One of the main contributions of the study is the derivation of canonical equations for these nanobeams and the first application of the Complementary Functions Method (CFM) to this particular class of problems. Parametric analyses were conducted to evaluate the effects of beam geometry, curvature radius, material properties, and nanoscale effects on structural behavior. The findings also demonstrated that cycloidal nanobeams exhibit greater sensitivity to geometric and material variations.

The proposed formulation provides an effective computational framework for the analysis of curved nanostructures and is expected to contribute to future research on the design and analysis of advanced nano-engineered structural systems.

The Civil Engineering Department congratulates Assoc. Prof. Ahmad Reshad NOORI on this valuable scientific achievement and wishes him continued success in his academic studies.

ORIGINAL ARTICLE

Warping-inclusive bending behavior of out-of-plane loaded axially functionally graded circular and cycloidal nanobeams

Anfel Chaima Hadidane, Ahmad Reshad Noori and Timuçin Alp Aslan

Proc IMechE Part C: J Mechanical Engineering Science
1–18
© IMechE 2026
Article reuse guidelines:

ABSTRACT

This study conducts an out-of-plane bending analysis of axially functionally graded (AFG) circular and cycloidal nanobeams utilizing nonlocal elasticity theory. Regarding the methodology the governing equations are expressed in curvilinear coordinates and resolved utilizing the Complementary Functions Method (CFM) in conjunction with a fifth-order Runge–Kutta (RK5) algorithm, facilitating precise assessment of displacements, rotations, and internal forces without discretizing the domain. This study primarily contributes to the existing literature by obtaining the canonical equations for AFG nano circular and cycloidal beams. Additionally, it marks the initial implementation of the CFM to address this particular class of problems.The influence of key parameters on the structural response is evaluated. The findings indicate that elevating the beam height significantly diminishes transverse displacement and rotations, demonstrating improved stiffness. Larger curvature radii lead to enhanced deformation, signifying increased structural flexibility. The nonlocal parameter induces a distinct softening effect, primarily influencing displacement fields, whereas material gradation significantly governs stiffness, particularly under clamped–clamped boundary conditions. Cycloidal nanobeams demonstrate heightened sensitivity to geometric and material alterations relative to circular designs, underscoring their potential for adjustable structural performance. In conclusion, the suggested formulation establishes an effective and dependable framework for the analysis of curved nanostructures and yields significant insights for the creation of sophisticated nano-engineered systems.

BASIC SCIENCES

Recent International Scientific Publications from Our Faculty Member in the Department of Basic Sciences

Prof. Dr. T. Abdeljawad, a faculty member in the Department of Basic Sciences at Istanbul Gelisim University's Faculty of Engineering and Architecture, continues his academic productivity with international scientific publications released in 2026.

Prof. Dr. Abdeljawad's current research covers a broad range of areas, including fractional calculus, integral inequalities, numerical solutions of integral and integro-differential equations, multi-criteria decision-making methods, the reliability of artificial intelligence systems, and nonlinear mathematical models. His work demonstrates the applicability of mathematical theory across diverse disciplines, from health sciences and artificial intelligence to decision support systems and advanced physical models.

Among recent publications, a study examining the incidence and risk factors of malaria through fractional mathematical models, along with hematological and immunological assessments, stands out. Furthermore, the evaluation of the risk of generating erroneous or inaccurate outputs, known as "hallucinations," in generative artificial intelligence systems, and the assessment of the reliability of these systems using multi-criteria decision-making methods, offers a significant mathematical perspective to current artificial intelligence research.

Prof. Dr. Abdeljawad's work also addresses theoretical and applied research topics such as current developments in multiplyative fractional calculus, numerical methods developed for integral and integro-differential equations containing weak singular kernels, fuzzy logic-based supplier selection models, and the control of spatio-temporal solitons in nano-composite structures. These studies, published in international journals such as Scientific Reports, Journal of Inequalities and Applications, and Computational and Applied Mathematics, contribute to strengthening the interdisciplinary link between fundamental sciences and engineering, health, artificial intelligence, and computational sciences. As the Istanbul Gelişim University family, we congratulate Prof. Dr. T. Abdeljawad for his current contributions to the international scientific literature and his sustainable academic productivity, and wish him continued success.

Some of the Current Publications for 2026

Incidence and risk factors of malaria with hematological and immunological evaluation and integrable analysis of a fractional mathematical model

A comprehensive survey on recent advances in multiplicative fractional calculus and related integral inequalities

A robust numerical scheme for addressing AVIEs and AVIDEs involving smooth and weakly singular kernels

A robust multi-criteria supplier selection framework based on linguistic cubic interval-valued intuitionistic fuzzy aggregation operators

Hallucination risk and trustworthiness of generative AI systems based on IVMPF-MABAC decision-making strategies

Coherent control of dark and bright spatio-temporal solitons of SPPs at a silver silica nano-composite interface with gain-assisted atomic medium

SHAPE THE FUTURE

IGU FEA

COORDINATORS

Prof. Dr. Bayram ÜNAL

Asst. Prof. Nurdan TÜYSÜZ

Asst. Prof. Seda ERBAYRAK

CONTENT EDITORS

Res. Asst. Betül GÖK

Res. Asst. Elif ÖZTÜRK

Res. Asst. Enis ÖZBEK

Res. Asst. Melis Özşahin TOKER

Res. Asst. Ufuk ATEŞOĞLU

Res. Asst. Duygu TÜYLÜ

Res. Asst. Kemal ERTUNÇ

Res. Asst. Hasan YILDIRIM

DESIGN AND EDITING

Res. Asst. Beray İKİNCİ

CONTACT

(+90) 212 422 70 00

www.mmf.gelisim.edu.tr/en/