



FACULTY OF ENGINEERING AND  
ARCHITECTURE

# BULLETIN

NOVEMBER 2023



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## What you will read in this issue

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News from Faculty

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Actual Topics in Engineering  
and Architecture

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Academic and Scientific  
Activities

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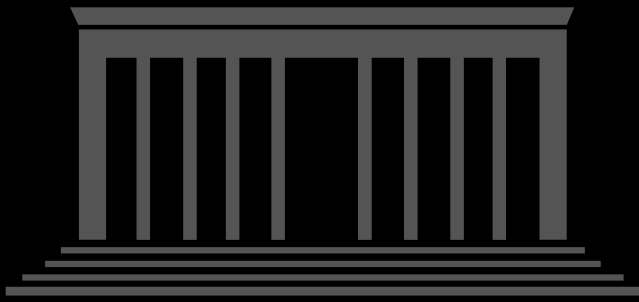


***NEWS FROM  
THE FACULTY***

The Great Leader  
Mustafa Kemal Atatürk

*We commemorate with respect.*

1881-1938



# News From The Faculty

N O V E M B E R 2 0 2 3

## **Industrial Engineering**

A technical trip was organized to ADS Engineering with the participation of Assist Prof Dr. Umut Hulusi İnan, member of Istanbul Gelisim University (IGU) Industrial Engineering Department, and 1st, 2nd, 3rd and 4th grade students.

During the ADS Engineering technical trip on Nov 13, 2023, conducted under the guidance of Industrial Engineering Faculty Member Assist Prof. Dr. Umut Hulusi İnan, the students visited the production, planning, quality department and R&D center and gained information from the company managers.



At the end of the event; it is aimed that students who are candidates to become industrial engineers will have a general knowledge about the operation and machinery in the factory, and at the same time will see the working environment. We believe that students will reflect on the observations they make and their knowledge and experience in the later stages of their lives and provide maximum benefit from the technical trip organization. We would like to thank ADS Engineering employees for their support and hospitality.

## CIVIL ENGINEERING

Within the scope of Civil Engineering Club Seminar activities, Cevdet ŞENTÜRK gave a seminar presentation on "Retrofitting of Reinforced Concrete Structures".



## Architecture

On November 4, a trip to Bursa was organized with the professors of the Department of Architecture, Assoc.Prof. İlke Ciritci, Dr. Meryem M. Findıkgil, and the students of the department. Within the scope of the trip, Trilye historical settlement, Mudanya, Cumalıkızık, Ulu Mosque, Orhan Gazi Tomb, Osman Gazi Tomb and Bursa historical area were visited.



## Architecture

**TMMOB Chamber of Architects Istanbul Büyükkent** Branch on October 28. After a two-hour workshop at the Chamber of Architects in Karaköy, Roman and Eastern Roman traces were observed during a city tour starting from SultanAhmet Square and ending at the Archaeological Museum. Students who are members of the Chamber of Architects studying at various universities attended the event.



Meryem Müzeyyen Fındıkgil'in anlatımıyla...  
TMMOB MİMARLAR ODASI İSTANBUL BÜYÜKKENT ŞUBESİNDEN

## KENT GEZİLERİ

öğrenci üyelere yönelik



-İSTANBUL OKUMALARI-

### "Geç Roma"

25 Kasım 2023 Cumartesi, 10.30

Gezi başlangıç noktası: Edirnekapi

Gezi buluşma noktası: TMMOB Mimarlar Odası  
İstanbul Büyükkent Şubesi Karaköy Binası

Ayrıntılı bilgi için web sitemizi ziyaret edebilirsiniz.  
Kayıt için [senanremimarist.org](http://senanremimarist.org) adresine mail atabilirsiniz.

[mimarist.org](http://mimarist.org)

 tmmob mimarlar odası  
istanbul büyükkent şubesi

## Architecture

Dr. Meryem M. Findıkgil, one of our faculty members from the Department of Architecture, moderated the meeting prepared for the launch of the German translation of historian Prof. Dr. İlber Ortaylı's book "The Longest Century of the Empire" on November 24. The author signed the book "Das längste Jahrhundert des Osmanischen Reichs" for the readers after the meeting organized by Literaturca Verlag at the Turkish-German Bookstore.





## Architecture

Prof. Dr. Mehmet Şener Küçükdoğu, Honorary President of the Turkish National Committee on Lighting, participated as the "Moderator" in the first session of the 11th National Lighting Symposium on November 2nd, which he attended as a guest of TMMOB Chamber of Electrical Engineers Izmir Branch.



## Architecture

The XIIth Congress of Architecture and Education, titled "The Second Century of the Republic and Architectural Education", was held at the Izmir Architecture Center on 10-11 November 2023, hosted by the Izmir Institute of Technology and TMMOB Chamber of Architects Izmir Branch. Dr. Nevzat Ömer Saatcioğlu, Department of Architecture, represented Istanbul Gelişim University - Faculty of Engineering and Architecture at the event, which is held every two years and where decisions are made that direct Architecture and Architecture education.



## Architecture

Within the scope of MIM323 Physical Environmental Control II course, a trip to Unicera - Ceramics and Bathroom Fair held at Istanbul Expo Center was held on November 8, under the leadership of Prof. Dr. Rana Kutlu and Res. Asst. Betül Gök.



Dr. İlknur Türkoğlu, who works as a faculty member in the Department of Architecture, provided guidance on the history and architecture of Iznik during the technical tour of the city of Iznik organized by the Maltepe Chamber of Architects on October 22, 2023. The documentary program shot within the scope of the trip was broadcast on Krt TV on November 12, 2023. In the documentary, Türkoğlu emphasized the importance of the city of Iznik throughout the ages, gave information about the medieval and Ottoman period structures that are still standing, and emphasized the importance of Iznik in terms of urban archaeology. The broadcast can be watched on YouTube.

Link: [https://youtu.be/6RFp\\_hIJMIM?si=EcbL7na2TOaD3zbn](https://youtu.be/6RFp_hIJMIM?si=EcbL7na2TOaD3zbn)  
[https://youtu.be/6RFp\\_hIJMIM?si=EcbL7na2TOaD3zbn](https://youtu.be/6RFp_hIJMIM?si=EcbL7na2TOaD3zbn)



Tarih.....: 12.11.2023 Pazar günü . 17.30'da  
 Programa katkı koyanlar : Prof. Dr. Alper Ünlü - Doç.Dr. Arkeolog  
 İlknur Türkoğlu - Y.Mimar Küratör Berna  
 Karadoğan - Seramik sanatçısı Adil Can  
 Güven - Peyzaj mim. Od. Yön.kur. üyesi  
 Nilüfer Birinci

### İZNİK'te tarihi yaşamak !



## Architecture

With the invitation of Işık University, Faculty Member of the Department of Architecture, Dr. Faculty Member Ayşe Öztürk, within the scope of the Architectural Design V project, the jury was held in the Chamber of Architects on November 27, 2023. Faculty Members of our Department, Dr. Faculty Member Erdal Yıldız and Lecturer Burak Kaan Yılmazsoy attended the jury.



## Architecture

Our Architecture Club, Club President and Club managers, together with our Lecturer Burak Kaan Yilmazsoy, visited and had a conversation with Bülend Tuna, Former Chairman of the Chamber of Architects, and Bülend Ceylan, President of the Architecture Foundation.



Architect İlayda Özdemir, architect Şenol Yankucu and architect Burak Demir, former graduates of our University's Department of Architecture, served on the jury of the MIM209 Architectural Design I course.



## Aeronautical Engineering

### **International Collaboration: Dr. Maksim Smolaninov Imparts "Computer Aided Technical Drawing" Course at Istanbul Gelişim University's Aeronautical Engineering Department through Erasmus+ Education Program**

Istanbul Gelişim University hosted a visiting faculty member from the Latvia Transport and Telecommunication Institute. Dr. Maksim Smolaninov contributed to an international collaboration by delivering a specialized course to students in the Aircraft Engineering Department.

Under the Erasmus+ Education Program, Dr. Smolaninov brought his extensive expertise from Latvia, sharing insights with students at Istanbul Gelişim University. Particularly, in the "Computer Aided Technical Drawing" course, he emphasized the latest developments in modern aviation engineering and design.

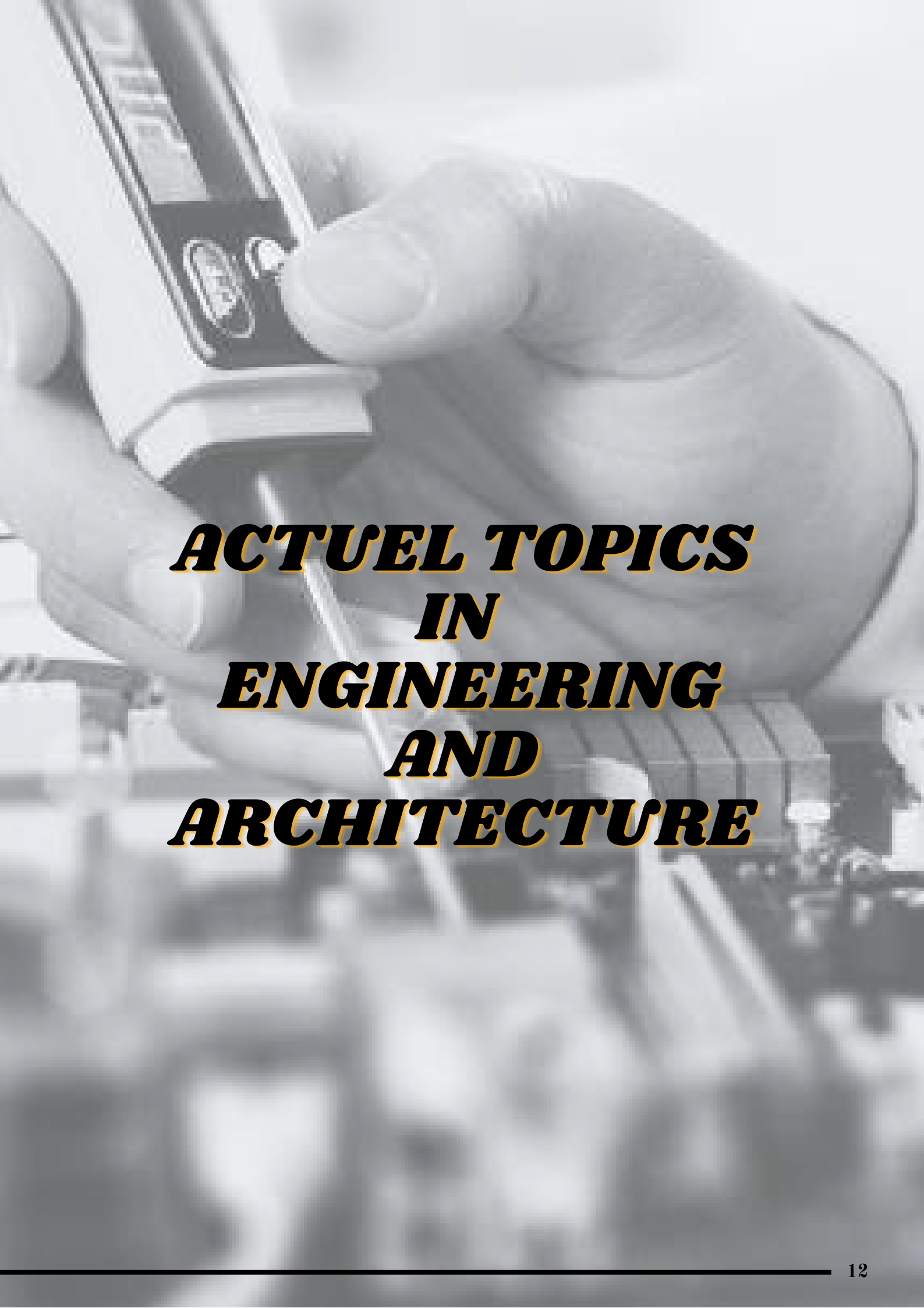
Students in the University's Aircraft Engineering Department had the opportunity to enhance both theoretical knowledge and practical skills through Dr. Smolaninov's interactive and participatory teaching. Stressing the significance of computer-aided technical drawings in the aviation industry, he provided detailed information on the current technological advancements in the field.

Istanbul Gelişim University's Aeronautical Engineering head of the department, Dr. Murat Metehan TURKOGLU, highlighted the significant contribution of Dr. Maksim Smolaninov to strengthening inter-university collaboration, stating, "Interactions with international faculty members like Dr. Smolaninov provide a tremendous opportunity to instill a global perspective in our students. His experience and knowledge have given our students the chance to learn the latest innovations in aviation engineering."

This interactive course not only provided students with theoretical knowledge but also allowed them to experience practical applications in the sector. The special class led by Dr. Maksim Smolaninov generated excitement and motivation among students while opening up numerous new opportunities for international collaboration.

As Istanbul Gelişim University continues to make a name for itself on the international stage through unique educational opportunities, collaborations with experienced faculty members like Dr. Maksim Smolaninov ensure that students gain a competitive advantage on the global stage.





***ACTUEL TOPICS  
IN  
ENGINEERING  
AND  
ARCHITECTURE***

# The Rise of Deep Learning in E-commerce: A New Era of Shopping Experience

## Hazırlayan: Arş.Gör. Mehmet Ali BARIŞKAN

### Introduction

In recent years, e-commerce has evolved rapidly into a dynamic and expanding sector. In this transformation, artificial intelligence, especially deep learning technologies, play a significant role. So, how is deep learning revolutionizing e-commerce?

### Personalized Shopping Experiences

Deep learning analyzes customer data to provide personalized shopping recommendations. Data such as past shopping behaviors, preferences, and demographic information are used to tailor product suggestions to individual customers.

### Automated Customer Services

Thanks to deep learning, chatbots and virtual assistants understand and respond accurately to customer inquiries. This not only enhances customer satisfaction but also provides cost and time savings for companies

### .Inventory and Demand Forecasting

Deep learning helps optimize stock levels by analyzing sales data. This leads to cost savings and increased customer satisfaction.

### Detection of Fake Reviews and Fraud

E-commerce platforms are employing deep learning algorithms to detect fake product reviews and fraud attempts.

### Conclusion

Deep learning is creating a revolution in the e-commerce sector. With personalized shopping experiences, automated customer services, and advanced inventory and demand forecasting, the future of e-commerce looks bright.





## GANs and Deepfake: The New Darlings of the Tech World

### Hazırlayan: Arş.Gör. Mehmet Ali BARIŞKAN

#### Hollywood Stars in a New Role: The Rise of Deepfake

Hollywood's brightest stars are now appearing not just on the big screen, but also in the depths of the internet, thanks to deepfake technology. GANs, or Generative Adversarial Networks, are creating images that are surreally realistic. Interestingly, this technology allows celebrities' faces to be placed in completely different videos, leading to astonishing and sometimes bewildering results.

#### A Revolution in Fashion and Art

The fashion industry and art world are embracing GANs, taking their creativity to new heights. Designers and artists are using this technology to create works that are unreal yet appear lifelike. These creations offer audiences unique and captivating experiences.

#### Ethical and Security Debates

GANs and deepfake are deeply influencing not just the realms of entertainment and art but also raising ethical and security concerns. The spread of misleading information and violations of personal privacy represent the darker aspects of these technologies. Cybersecurity experts are working on measures to counter the potential threats posed by deepfakes.

#### What Does the Future Hold?

As technology evolves day by day, the future of GANs and deepfake is a subject of great interest. Research in these areas could lead to safer and more responsible use of these technologies. Academicians and research assistants continue their work to better understand the effects and potential dangers of these technologies in the field of AI and cybersecurity.



## MMCU RESIST HACKING VIA ITS PROGRAMMING INTERFACE

### Hazırlayan: Arş.Gör. Elif ÖZTÜRK

Microchip has upped the security of a family of PIC18 microcontrollers by adding a one-time disable to its programming and debugging interface.

Called PDID (programming and debugging interface disable), “when enabled, this enhanced code protection feature is designed to lock out access to the programming-debugging interface and block unauthorised attempts to read, modify or erase firmware”, according to the company.

It is implemented on the PIC18-Q24 family of MCUs, and works with the ICSP (in-circuit serial programming) interface.

Once the PDID configuration bit is turned on “the device is permanently locked down from ICSP access and no further bulk-erase operations are possible”, explained the company. “However, the memory regions can still be accessed using the internal NVM [non-volatile memory] interface. This feature is intended to make the device one-time programmable through the ICSP interface for security applications.”

The PDID bit can be programmed either through ICSP or a self-write, and after this is not possible for a device executing in ‘debug mode’ to erase or write flash memory, nor can a debug tool switch the device to ‘production mode’.

To allow failure analysis in devices with PDID in operation, limited ICSP function can be restored by boot-loader code stored in the device that programs a specific unlock sequence. This will allow ICSP read commands to be performed, while writing to program flash, performing bulk erase, performing page erase, and reprogramming the device via ICSP, will remain blocked.

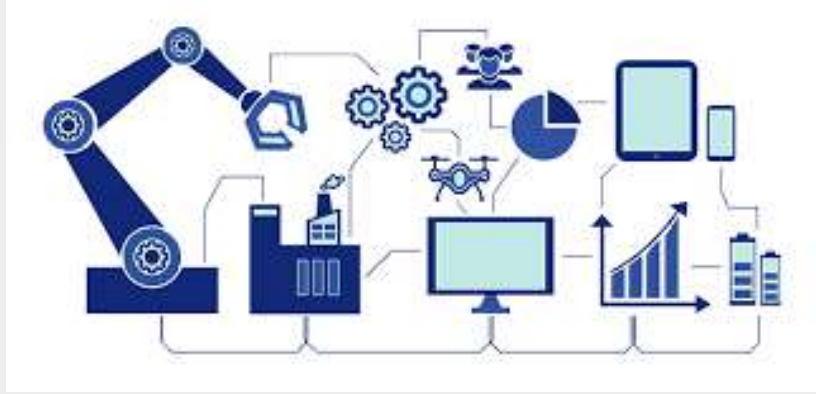
“The PIC18-Q24 family is also enabled with the option to have an immutable bootloader for applications that want a secure way to upgrade firmware,” said Microchip.

Development tools include the Microchip PIC18F56Q24 curiosity nano eval kit (pictured).



## The Role of Industrial Engineering in Shaping the Future: Journey to Technology

Hazırlayan: Arş.Gör. Duygu TÜYLÜ



Today, the rapid advancement of technology carries the discipline of industrial engineering to a new dimension. Industrial engineering plays a key role in areas such as optimizing business processes, increasing efficiency and creating sustainable solutions. While evolving technology offers more opportunities for industrial engineers, it also expands the skill set expected from these professionals.

### *Digital Transformation and Industry 4.0*

Industrial engineering has undergone a significant evolution with the digital transformation brought about by Industry 4.0. This transformation includes technologies such as the internet of things (IoT), artificial intelligence (AI), big data analytics and automation. Industry 4.0 offers solutions to reduce error rates while increasing efficiency in production by making production processes smarter and more connected.

With this technological change, industrial engineers are improving their ability to make factories smarter, optimize supply chains and respond faster to customer demands. Thanks to data analytics, industrial engineers can analyze large data sets, identify improvements in business processes and develop future strategies.

### *Education and Skills Development*

Continuous education and skill development are important for industrial engineers who can keep up with developing technology. Knowledge of topics such as digital skills, data analytics, artificial intelligence applications and programming can help industrial engineers increase their competitive advantage.

Industrial engineering education programs should provide students with opportunities to study and apply these emerging technology trends. Internships, projects, and industry collaborations provide students with real-world experiences so they can work effectively in this rapidly changing industry when they graduate.

In conclusion; Developing technology makes the industrial engineering discipline more exciting and effective. Industrial engineers must constantly update themselves with these technological developments and adapt to changing needs. In the future, industrial engineers are expected to be at the forefront of optimizing business processes, producing sustainable solutions and using technology effectively.

## Flywheel Energy Storage Systems

Haydar Kepekçi\*

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### Abstract

This article examines the potential and advantages of flywheel energy storage systems. Flywheel energy storage stands out as a technology that stores and recycles kinetic energy through rotational motion. These systems offer advantages such as high energy density, rapid charging/discharging capabilities, and long lifespan. Moreover, they are seen as an effective solution for balancing fluctuations in renewable energy sources and providing power. This article discusses the current status, working principles, and application areas of flywheel energy storage systems. In conclusion, flywheel energy storage could play a significant role in the future of the energy storage sector.

**Keywords:** Flywheel energy storage systems, Kinetic energy storage, Energy storage technology



## Numerical Investigation of the Thermal and Acoustic Effect of Material Variations on the Exhaust Muffler

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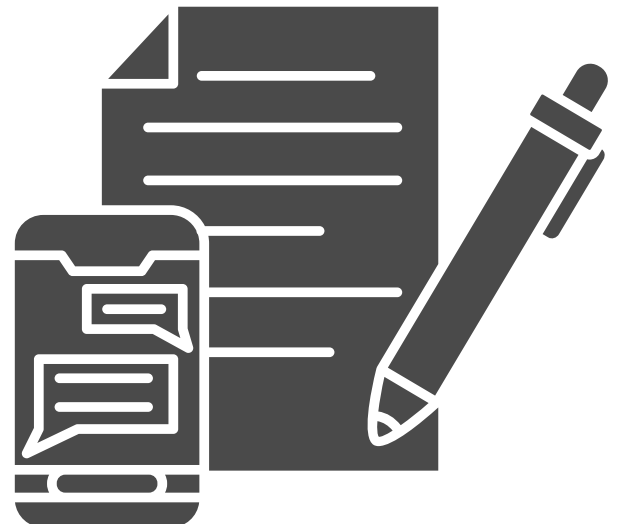
<sup>2</sup>Istanbul Cerrahpaşa University, Istanbul /Turkey,

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### Abstract

Exhaust silencers are used in automobiles to prevent the noise arising from exhaust gases resulting from internal combustion engines. With the advancement of the automotive industry, exhaust silencers have become more complex over time to reduce noise and increase driving comfort. Within the scope of this study, exhaust silencer geometries with different geometries have been designed, and harmonic acoustic analyses have been carried out. In the analysis, the airflow speed has been accepted as 30 m/s. Acoustic pressure and transmission loss data obtained as a result of analyses performed with 1Pa pressure input have been evaluated. As a result of the evaluations, it has been concluded that the silencer modeled in a complex structure has been better acoustically. Although the main task of exhaust silencers is to reduce the sound level at the exit of exhaust gases, it is also important to reduce the temperature of the air in the exhaust system and have good thermal conductivity so as not to jeopardize the thermal safety of the system. For this reason, CFD thermal flow analysis has been carried out with 4 different materials using a complex design with high acoustic efficiency. Gray cast iron, stainless steel, 1020 steel, and aluminum have been used as materials. In this part of the study, it has been determined that the use of aluminum material has been better in terms of thermal efficiency.

**Keywords:** Exhaust silencer, Harmonic acoustic analysis, Thermal flow analysis, Computational fluid dynamics





***ACADEMIC AND  
SCIENTIFIC  
ACTIVITIES***

**INDUSTRIAL ENGINEERING**

Working in Industrial Engineering Department, Res. Ass. Nurdan Tüysüz's article titled "An Integrated Picture Fuzzy Z-AHP & TOPSIS Methodology: Application to Solar Panel Selection" has been published in the SCI-Expanded indexed and Q1 journal "Applied Soft Computing".

Student in Industrial Engineering Department, İrem Türkyılmaz and and Electrical Program Instructor İzzet Yavuz paper titled "Renewable Energy Resource Conversion Analysis and Design for the Energy Needs of Industrial Companies" was presented at the Iv-International Siirt Conference On Scientific Research Congress in Siirt on 17-18 November.



Working in Industrial Engineering, Assist Prof. Dr. Binnur Yılmaz participated as a jury in the doctoral thesis defense at Istanbul Aydın University.



**CIVIL ENGINEERING**

Prof. Dr. Mustafa KARAŞAHİN, one of our department members, chaired the session titled "Highway Superstructure" at the 5th Highway Congress held in Ankara on November 22-23, 2023.



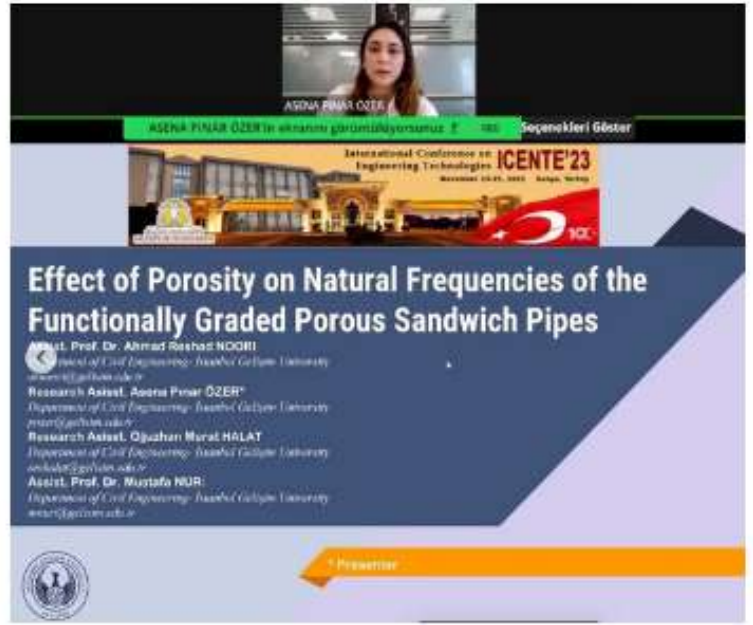
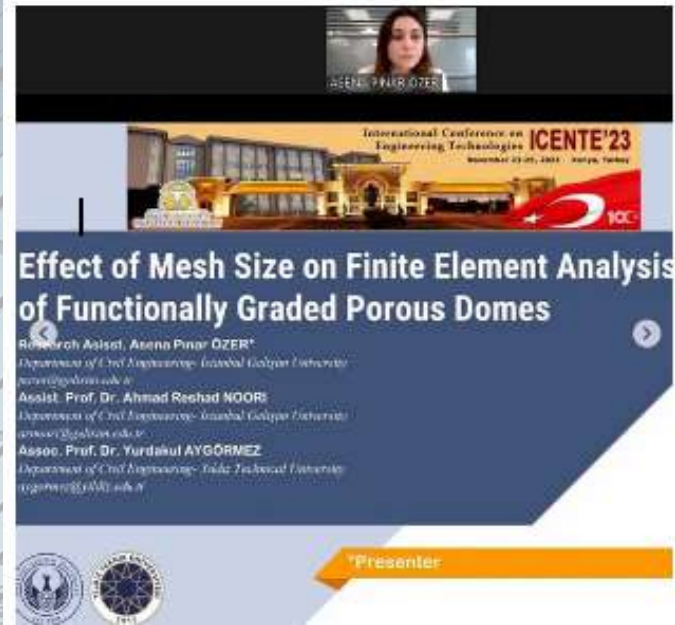
The conference papers titled “Experimental Study on Effectiveness of Tire Waste-Sand Cushion on Seismic Performance of Retaining Wall” and “Source Parameters of the 2023 Kahramanmaraş Earthquake Aftershocks in the East Anatolian Fault Zone” prepared by one of our department member, Res. Asst. Bilge Sultan DEMİRTAŞ was presented in the 7th International Conference on Earthquake Engineering and Seismology (7ICEES) held in Antalya on November 6-10, 2023.

The conference papers titled “Effects Of Characteristics Of Earthquake Motion On Seismic Performance Of Retaining Wall With Tire Waste-Sand Cushion: Experimental Study” prepared by one of our department member, Res. Asst. Bilge Sultan DEMİRTAŞ was presented in the 9th Geotechnical Symposium held in İstanbul on November 22-24, 2023.





The conference papers titled “Effects of Mesh Size on Finite Element Analysis of Functionally Graded Porous Domes” and “Effect of Porosity on Natural Frequencies of the Functionally Graded Porous Sandwich Pipes” prepared by one of our department member, Res. Asst. Asena Pınar ÖZER, was presented in the International Conference on Engineering Technologies (ICENTE’23) held in Konya on November 23-25, 2023



## MECHATRONICS ENGINEERING

At the "Energy Efficiency" congress organized by the Chamber of Mechanical Engineers at Gebze Technical University on 17-18 November 2023, Assist. Prof. Dr. Haydar İzzettin KEPEKÇİ made an presentation on "Flywheel Energy Storage".

At the 7th International Conference on Engineering Technologies (ICENTE 2023) held by Konya Selçuk University on 23-25 November 2023, Assist. Prof. Dr. Haydar İzzettin KEPEKÇİ made an presentation on "Numerical Investigation of the Thermal and Acoustic Effect of Material Variations on the Exhaust Muffler".

Assist. Prof. Dr. Kenan ŞENTÜRK and his colleagues participated in the 6th International Agriculture, Environment and Health Congress held in Aydın / Turkey between 19-21 October 2023 with the study titled "Production of Nitrogen Fertilizer with Plasma Activated Water"

# İSTANBUL GELİŞİM UNIVERSITY GRADUATE TRACKING SYSTEM

Graduate Tracking System (METSİS) was opened to determine and follow the current status of our graduates, such as employment and post-graduation education, and to create statistical data. Istanbul Gelişim University has activated METSİS in order to strengthen its relations with graduates and contribute to the employment of graduates. Our graduates can become members of METSİS free of charge. (metsis.gelisim.edu.tr)

Our graduates who are METSİS members can follow our job postings by updating their personal profiles.

## How do I become a member of METSİS?

Log in to [metsis.gelisim.edu.tr](https://metsis.gelisim.edu.tr) platform.

You can follow the postings in the open positions box.

To apply for the postings, you can create an account from the New Candidate box.

After creating an account, you can view job postings and apply for suitable positions from the postings tab at the top.

## GRADUATE SATISFACTION SURVEY

Dear IGU Alumni,

Within the scope of the Strategic Plan, a "Graduate Evaluation Survey" has been developed in order to obtain your opinions as an important stakeholder and to determine the program and course outcomes in line with these opinions.

If you want to see your university in higher rankings, we kindly ask you to fill out the survey and thank you for your participation.

Graduate Evaluation Survey:  
<https://metsis.gelisim.edu.tr/>

