FACULTY OF ENGINEERING AND ARCHITECTURE

BULLETIN

● AUGUST 2024 ●

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NEWS FROM THE FACULTY

RESEARCH ASSISTANT ERDI ACAR'S TEKNOFEST SUCCESS

We are thrilled to announce that our esteemed colleague, Research Assistant Erdi Acar from the Department of Computer Engineering, has achieved remarkable success at TEKNOFEST 2024. As the captain of a highly skilled team, Erdi Acar led his group to the finals of the Quantum Hackathon Competition, held on August 24-25, 2024, at the Bilişim Vadisi Campus in Gebze, Kocaeli.

The competition, which saw participation from 75 teams and 250 contestants from across Turkey, was centered around developing innovative solutions for the "Optimization of Donor-Recipient Matching Using Quantum Computing Methods." Teams were evaluated through a rigorous process that included electronic exams covering topics such as quantum physics, linear algebra, probability, quantum computing fundamentals, quantum algorithm design, and hands-on Python-Qiskit programming.

NEWS FROM THE FACULTY

Erdi Acar's team distinguished themselves among the top 10 teams that advanced to the final round. In the final stage, the teams were tasked with developing and executing quantum algorithms using Python, based on specific input criteria. The results were then presented to a jury, alongside a comprehensive final report.

We are proud to announce that the winners of the competition will be revealed at the upcoming TEKNOFEST Aviation, Space, and Technology Festival, to be held at Adana Şakirpaşa Airport from October 2-6, 2024. The first-place team will receive a prize of 150,000 TL, the second-place team 120,000 TL, and the third-place team 100,000 TL.

We extend our heartfelt congratulations to Research Assistant Erdi Acar and his team for their outstanding performance and wish them the best of luck in the final announcement. This achievement is a testament to their hard work, dedication, and expertise in the field of quantum computing.

NEWS FROM THE FACULTY

2024 University Preference Results have been announced. According to the data announced by ÖSYM, the quota of IGU Mechatronics Engineering Department has reached 90% occupancy rate. We congratulate our new students and wish them success in their university life

Prof. Dr. Hamdi Alper ÖZYİĞİT, Head of the Department of Mechatronics Engineering, participated as a jury for the PhD Thesis Defense at Zonguldak Bülent Ecevit University, Department of Mechanical Engineering on August 22, 2024.

NEWS FROM THE FACULTY

The urban dreams workshop, which took place at the Chamber of Architects Maltepe Representative Office with the participation of students from different universities, was conducted by Assoc. Prof. Türkan Uzun and Lecturer Burak Kaan Yılmazsoy, faculty members of our Architecture Department.

In this context, our professors supported the students in their project development processes for an average of one month. During this process, the project processes of an average of 20 students were developed with the contributions of our professors. During this period, two juries were formed with the participation of our professors and other workshop directors, the first of which took place in the third week, and the other took place in the last week with the participation of Maltepe Mayor Architect Esin Köymen and the Municipality teams.

In the last week of the workshop process, which was held with the participation of our academicians Assoc. Prof. Türkan Uzun and Lecturer Burak Kaan Yılmazsoy, who were workshop conductors at the summer school workshop in the Maltepe Representative Office of the Chamber of Architects, technical tour visits were made to the Basilica Cistern, Şerefiye Cistern and Süleymaniye Mosque with the participation of all students, during which technical sharing and presentations were made by Chamber of Architects Board Member Koray Atay and our academician Assoc. Prof. Türkan Uzun on mosque architecture and Süleymaniye

NEWS FROM THE FACULTY

Excavation head Assoc. Prof. Selçuk Seçkin, Dr. Meryem M. Fındıkgil and thesis advisor Assoc. Prof. İlke Ciritci held a meeting on August 19, 2024 at the Yalova Çobankale Excavation Site for discussions on the thesis of our master's student Rabia Nur Ertuğrul titled 'Archaeological Site Welcoming Center Formation Principles: Welcoming Center Design Proposal Based on the Çobankale Excavation Site Example'. The final status of the thesis before the defense was shared with the excavation team in the actual area where the application would be made, and the archaeological site and the products to be exhibited were observed on site due to their importance in the content of the design.

One day of the Summer School workshop of the Chamber of Architects, a workshop was held at the Eco Art Workshop in the Istanbul Museum of Modern Art, where parchment, primitive craft pulp, and paper obtained from drying trays were produced

Two finals were organized for the Chamber of Architects Summer School workshop. The first of these was held at the Chamber of Architects Maltepe Representative Office, and the last final presentations were held at the Chamber of Architects Istanbul Metropolitan Branch. Our faculty members Assoc. Prof. Türkan Uzun and Lecturer Burak Kaan Yılmazsoy, who were the workshop directors, were presented with certificates of appreciation for their efforts in the workshops they attended during the month.

● ARCHITECTURE ●

Within the scope of Introduction to Architectural Design II course, during the summer school conducted by Lecturer Burak Kaan Yılmazsoy, an interim jury was held with the participation of Architect Mine Çiçek.


Presentations made by the executives in the summer school internship study organized by the Chamber of Architects; Türkan Uzun _Atmosphere Criteria: Physical, Sensory and Emotional Experience of Space_Burak Kaan Yılmazsoy_Urban planning principles and green area arrangement_M.Yusuf Tezcan _Public Space Characteristics and Examples from the World_ Ezgi Nur Mengülerek _Atmosphere Criteria: Physical, Sensory and Emotional Experience of Space, / Functions and Functions of Public Spaces_Zeynep Ülkücü _Classification of Urban Furniture

NEWS FROM THE FACULTY

Within the scope of the summer school workshop process organized by the Chamber of Architects, on the weekend coinciding with the second Sunday of the workshop, a boat trip was held where the Bosphorus mansions and their history were explained with the participation of Dicle University Department students, Department Heads Prof. Dr. Havva Özyılmaz and Assoc. Prof. Nursel Işık, IGU Academic Staff Assoc. Prof. Türkan Uzun and Lecturer Burak Kaan Yılmazsoy and the Chamber of Architects Directors.
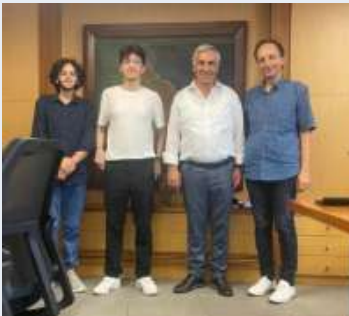
A technical field trip was made in connection with the study topic within the scope of the Introduction to Architectural Design II Summer School course conducted by Lecturer Burak Kaan Yılmazsoy. Before that, a meeting was held with Ahmet Erkan, Secretary of the Chamber of Architects, Istanbul Metropolitan Branch.

FACULTY OF ENGINEERING AND ARCHITECTURE

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

MONTHLY BULLETIN

AUGUST 2024

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

BASIC SAFETY PRECAUTIONSÖĞR. – GÖR. DR. OĞUZHAN TAŞ

Nowadays, we handle almost all of our transactions online, stay in constant contact with our acquaintances through social media, and can even conduct new job interviews. While this provides us with speed, time savings, and convenience, losing the password to one of our accounts can turn our lives into a nightmare. We frequently hear news about Instagram accounts being hacked, and the main reason for this is often the use of weak and easy-to-guess passwords. No matter how secure Instagram is, users' weak passwords can lead to personal issues. The same applies to companies and institutions, where employees using weak passwords can put the entire system at risk.

Regardless of the security measures taken on websites and network systems, a single individual who neglects password security can jeopardize the entire system. Let's summarize the precautions we should take:

1.Use Different Passwords for Different Accounts: Passwords used for e-commerce sites, email accounts, and banking applications should not be the same. If you use your email password to sign up for a site, that person could access your email account and read all your emails. Generally, the passwords for Facebook, YouTube, and Instagram accounts are the same as your email. You might think, "What can we do? It's easy to remember so many passwords." Develop a method that works for you. For example, at least use prefixes like Fb for Facebook, Em for email, and Ins for Instagram at the beginning of your passwords. Adding symbols (%, +, -, ?, !) at the end can make your passwords harder to crack.

2.Avoid Using Personal Information as Passwords: Never use your birthdate, license plate number, or home or mobile phone numbers as passwords. This is referred to in the literature as a Social Engineering Attack. This type of attack involves obtaining passwords based solely on a person's information without using any scientific methods. Many users set their home or workplace modem password to their landline number, allowing anyone to access their wireless network simply by reading the phone number from a shop's banner or advertisement. Don't say, "What does it matter if someone uses my wireless internet?" If someone hacks using your wireless network or makes illegal statements on the internet, you will be held directly responsible.

● COMPUTER ENGINEERING ●

3.Use Simple Passwords for Less Important Websites: For websites that require mandatory membership but are not deemed very important, you can use simpler passwords. However, for critical applications like e-government or banking, be sure to choose a password that is more careful and not used elsewhere.

4.Use a Virtual Keyboard: To protect against the possibility of having a keylogger (spyware that captures keystrokes) on your computer, always use a virtual keyboard. Similar to logging into bank systems, you can use on-screen keys to enter information. If the system does not have a virtual keyboard, you can access the on-screen keyboard in Windows by following this path: Windows Start - Accessories - Ease of Access - On-Screen Keyboard. You cannot fully prevent harmful programs like keyloggers from entering your computer, as malware can come from various sources, including USB drives. If you notice extreme slowness on your computer or excessive usage of memory and CPU, you may suspect malware. It is recommended to use licensed antivirus software, as the Windows Defender antivirus program that comes with Windows is unfortunately not sufficient..

5.Beware of Ransomware Attacks: Ransomware can appear as an innocent-looking invoice in an email sent to a company account. When you click on the attachment, the ransomware infects the computer and the company network, encrypting all the information on the computers. The encryption is usually done using AES, one of the most powerful known algorithms. Once the accounting records of a company or the student files of a university are encrypted, it is nearly impossible to decrypt them. After some time, the attackers will send an email demanding a ransom, which varies depending on the size of the company.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● COMPUTER ENGINEERING ●

The attackers may observe the network for a long time, analyzing the files and determining the company's earnings before setting the ransom. To protect against ransomware, always verify the actual sender of the email and do not open email attachments. Computers and network security should be regularly tested by companies specializing in penetration testing.

6.Avoid Sequential Numbers in Passwords: Do not use passwords composed of sequential numbers. When creating passwords, ensure that they contain at least one lowercase letter, one uppercase letter, a number, and a symbol ($, #, +, ., %, &, ?, =). While it used to be sufficient to have an 8-character password, today passwords should be at least 12 characters long, as shorter passwords, such as those with 2-3 characters, can be easily identified. Using special characters and symbols in passwords is crucial, as it helps protect against attacks like Dictionary Attacks, where all possible word combinations in a dictionary are tried.

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7.Do Not Write Down Your Passwords: Don't write down your passwords everywhere just because you forget them. If someone you do not trust sees your password, you are at risk. For example, a school principal writes the e-school password on a piece of paper and sticks it to the computer. A mischievous student takes a photo of the paper and changes their grade in the e-school system. Later, when they start changing other students' grades for money, they are caught following a report.

8.Managing Multiple Credit Card Passwords: How can you set different passwords for so many credit cards? Let's say you have four bank cards. You can use this method to create different passwords for each: every card has a 12-16 digit number on it; use the first two and last two digits or any four digits you choose according to a specific pattern as your password. Use the same method for all cards, and the passwords will be different.

9.Protect Your Credit Card Information: To shop online, all you need are your credit card details; you don't actually need to have the physical card. The CVC code, expiration date, and credit card number are enough for financial transactions. When paying at a restaurant, never send your credit card with a waiter. Similarly, do not hand your card to an attendant at a gas station. Always go to the POS machine yourself or ask for the POS machine to be brought to you. A malicious person could photograph your card along the way. "Credit card cloning fraud" is defined in Article 245 of the Turkish Penal Code as "obtaining a fake credit card by copying credit card information." Credit cards can also be cloned using illegal devices installed on ATMs.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

Someone might offer to help you at an ATM, learn your card's PIN, and then claim that "the ATM swallowed your card" to take it from you. If you notice anything suspicious or if your card is unnecessarily retained, immediately call your bank to cancel your card if necessary; a new one will arrive within 7 days.

10.Regularly Monitor Your Account Statements: Periodically check your credit card transactions in your account statements. If you notice any unexplained transactions or suspicious withdrawals, be sure to report them to your bank.

11.Beware of Wireless Network Eavesdropping: With today's technology, it's become quite easy to eavesdrop on a wireless network using open-source software. Simple encryption techniques cannot stop attackers. Never send your credit card information through a messaging program or email. Even sending an SMS is more secure, but be sure to delete the SMS right after sending it. Also, be careful if you store passwords on your mobile phone. If you forget your phone somewhere, it could pose a risk. Many users save their passwords in their phone as if they were phone numbers, which can create a security vulnerability.

12.Encrypt Sensitive Information: Highly confidential company information or security-related government documents should not be stored in folders without encryption. Invisible folders and drives can be created using various programs in Windows. However, be careful not to delete these folders or drives when formatting the computer.

13.Don't Rely on Windows Login Passwords: Windows login passwords can be easily cracked with a bit of effort. It's possible to access Windows systems like FAT32, NTFS, and their files and folders simply by removing a hard drive and connecting it to another computer.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

If you must use Windows, encrypt folders and drives individually. For example, you can use appropriate software to fully encrypt and hide the D:\Projects folder.

14.Lock Your Computer When Away: If you leave your computer during a lunch break or for a short period, you can lock your screen to prevent others from tampering with it by using the CTRL+ALT+DEL key combination and selecting "Lock Computer" from the screen that appears.

15.Disable "Save Password" in Browsers: Do not enable the "Save Password" option in web browsers like Chrome, Firefox, and Edge. For example, if the user ID and password fields are already filled in by default when you log into a personnel system, even if they appear as stars, they can still be learned. You can also remove previously saved passwords from the browser's settings.

16.Change Default Passwords: Never leave your devices with their factory default passwords. For example, cameras and modems come with default passwords from the factory, and these should be changed. Otherwise, others could watch your home or business through the internet, or use your modem.

17.Regularly Update Your Software: Regularly update the software you use. Software companies add new features and close security loopholes in new versions. Especially keep operating system updates enabled.

18.Periodically Update Passwords: Regularly updating passwords is also important for security. Banks and systems like e-government usually remind you to update your passwords every 3-6 months, and even this period is quite long.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● COMPUTER ENGINEERING ●

19.Don't Rely on Password-Protected Excel or Word Files: These files can be easily cracked with simple software, but for basic security and deterrence, it's important to set passwords for critical files.

20.Security Tips for IT Professionals and Developers: The previous points were for general internet users; this last one is for IT professionals and software developers. If you are a developer or system administrator, store user passwords in the database using hash algorithms (like MD6, SHA1, SHA2, RIPEMD). These libraries are available as ready-made methods within C# .Net libraries and web languages like PHP. Don't forget to add salt to the information that will be encrypted. Even if the database is compromised, user passwords cannot be learned. Other fields besides passwords in a table may also need encryption. For these, use symmetric encryption algorithms like AES or RC6.

Always use a token when saving and updating forms to protect against many form attacks.

Always validate information received from a form. Perform validation both on the client and server sides. Regular expressions can be used in form validation.

To protect against SQL Injection attacks, do not send information received from a form to the database without filtering it. Use parameterized approaches in ASP.net or the Sanitize method in PHP for this purpose.

● ELECTRICAL AND ELECTRONICS ENGINEERING ●

FUTURE ENERGY SOLUTIONS: NEW HORIZONS IN ELECTRICAL AND ELECTRONICS ENGINEERING – RES ASST.ELIF ÖZTÜRK

Electrical and electronics engineering is playing a crucial role in today's rapidly evolving technology landscape, especially in the development of innovative energy solutions. The growing importance of renewable energy sources has made it essential to develop cutting-edge solutions in this field. Engineers are focusing on next-generation power electronics devices and smart grid systems to maximize efficiency from sustainable sources like solar and wind energy.

Universities and research centers in Turkey are making significant contributions to globally recognized projects in this field. Particularly, studies on the storage, distribution, and efficient use of electrical energy aim to reduce future energy costs and minimize environmental impact.
Moreover, electric vehicles and battery technologies are gaining substantial momentum. Electrical and electronics engineers are focusing on developing lighter, longer-lasting, and faster-charging batteries. These advancements are accelerating the transformation of the automotive industry and paving the way toward energy independence.

Additionally, smart home systems and IoT (Internet of Things) devices are key areas of focus within this engineering discipline. These devices optimize energy consumption, improving user experience and enhancing energy efficiency.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

Thus, electrical and electronics engineering offers innovative solutions not only in the energy sector but also in every aspect of daily life. In the coming years, the contributions of electrical and electronics engineering to the energy sector are expected to increase even further. The work being done in this field is vital for ensuring a sustainable future, both economically and environmentally.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

BLOCKCHAIN TECHNOLOGY IN INDUSTRIAL ENGINEERING – RES. ASST. DUYGU TÜYLÜ

Blockchain technology is an innovative solution that has the potential to revolutionize supply chain management, manufacturing processes, and logistics in industrial engineering. This technology can make industrial operations more efficient and reliable by providing a decentralized, transparent, and secure record keeping system.

In supply chain management, blockchain makes it easier to track and verify the journey of products from production to consumer. The history of each product is transparently recorded on the blockchain, preventing counterfeiting and ensuring the authenticity of products. For example, in the food industry, blockchain can be used to track the source of food and increase food safety.

In addition, blockchain automates business processes through smart contracts. These contracts are programmable agreements that are automatically put into effect when certain conditions are met. In this way, bureaucracy in industrial processes is reduced and transactions are carried out more quickly and reliably.

● INDUSTRIAL ENGINEERING ●

The security advantages offered by blockchain are also critical for industrial control systems. Its decentralized structure provides a system that is more resistant to cyber attacks and increases the security of data. By integrating this technology, industrial engineers can make manufacturing processes and supply chains more efficient, transparent, and secure.

As a result, blockchain technology stands out as a powerful tool for optimizing processes, increasing security, and efficiency in industrial engineering. In the future, this technology is expected to find a wider range of applications.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● CIVIL ENGINEERING ●

WE RECEIVED THE OPINIONS OF ASSIST. PROF. DR. SAJEDEH NOROZPOUR SIGAROODI ABOUT THE ERASMUS+ STAFF MOBILITY PROGRAM SHE PARTICIPATED IN.

Can you introduce yourself and tell us about your educational background?

I am Dr. Sajedeh N. Sigaroodi, an Assistant Professor at Istanbul Gelisim University's Department of Civil Engineering. I completed my PhD in mathematics in 2018. After my doctorate, I started working at Near East University. In 2019, I joined the Istanbul Gelisim University family and continued my academic career in the Faculty of Architecture and Engineering, Department of Civil Engineering. Throughout my education, I aimed to share the knowledge and experiences I gained with my students, contributing to their academic and professional development.

How did your participation in the Erasmus+ Staff Mobility program come about? How did you take advantage of this opportunity?

My participation in the Erasmus+ Staff Mobility program began with the support of Istanbul Gelisim University for such international opportunities. After learning about the program, I carefully followed the application processes and prepared the necessary documents. Once my application was accepted, I communicated with the designated university and department in Poland to detail mutual cooperation and visit plans. Taking advantage of this opportunity, I gained valuable experiences both academically and culturally. By exchanging information with my colleagues teaching in Poland, I learned about different teaching methods and research techniques. Additionally, I observed Poland's educational system and culture, developing new ideas and approaches that I could apply at my own university. This process significantly contributed to my professional development and expanded my international academic network.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● CIVIL ENGINEERING ●

Can you share your general impressions of your visit to Państwowa Akademia Nauk Stosowanych University in Poland?

My visit to Państwowa Akademia Nauk Stosowanych University in Poland was a very impressive and instructive experience for me. I had positive impressions of the academic environment, research facilities, and student-teacher relationships at the university. First, the university's modern and well-equipped laboratories and research centers provide a very suitable environment for scientific studies. Especially the projects and technologies used in the field of civil engineering gave me the opportunity to closely follow innovations in the field. The academic staff is very open to international collaborations and interdisciplinary studies, which reinforces the university's dynamic and progressive structure. Culturally, it was also a rich experience. The hospitality of the Polish people and the rich cultural heritage made my visit even more special. I had the opportunity to explore the historical and cultural sites in the city where the university is located, gaining a broader perspective on Poland's education system and culture.

What activities did you participate in during your visit, and who did you have the opportunity to meet?

During my visit to Państwowa Akademia Nauk Stosowanych University, I participated in various academic and social activities. I attended a speech and seminar given by the university's rector for International Bee Day. Additionally, I participated in a workshop where health students provided first aid training. Through these activities, I had the opportunity to get to know the academic structure and student activities of the university more closely. I conducted one-on-one meetings with the academic staff and students, gaining different perspectives and experiences.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

What benefits can such international programs provide to our university and students?

International programs offer many important benefits to our university and students. Firstly, these programs increase academic and cultural diversity. Students and faculty interact with people from different countries and cultures, gaining global perspectives and being exposed to different viewpoints. Additionally, these programs strengthen academic collaborations and enable joint research projects. Collaborations with different universities allow students and academics to explore new research areas and increase knowledge sharing. This enhances the academic quality and research capacity of our university. For students, there are significant advantages as well. International experiences support their personal and professional development. Language skills improve, and their ability to understand and adapt to different cultures increases. These experiences provide a competitive advantage in their careers and help them become more equipped in the international job market.

How did this visit contribute to your personal and professional development?

The visit offered the opportunity to experience a different culture and develop my skills in living in a new country, contributing to my personal development. It also improved my ability to express myself more comfortably and adapt in an international environment. Professionally, I had the chance to interact with academics and students at Państwowa Akademia Nauk Stosowanych University. These interactions carried the potential for creating new collaborations for joint research projects and academic exchange programs.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● CIVIL ENGINEERING ●

What are your views on the Civil Engineering Department at Istanbul Gelisim University?

The Civil Engineering Department at Istanbul Gelisim University offers a robust program with a strong academic staff and a solid education and research infrastructure. The course contents are designed according to the needs of the industry and closely follow current developments. Various laboratories and practical opportunities are provided to equip students with practical skills in addition to theoretical knowledge. The academics in the department are experienced in their fields and enthusiastic about mentoring students. Various events and projects are organized to support students' academic success and help them achieve their career goals. Active support is also provided for internships and post-graduation employment.

● MECHATRONICS ENGINEERING ●

THE PART OF MECHATRONICS ENGINEERING IN THE AUTOMOTIVE INDUSTRY

The Automotive Industry is one of the most widespread application areas of Mechatronics Engineering. Today's vehicles, once consisting of only mechanical components, are now equipped with complex electronic and software systems. This transformation has made it imperative to utilize the skills and knowledge of Mechatronics Engineers.

We can list the part of Mechatronics Engineering in the Automotive Industry in a few paragraphs.

Automation and Robotic Systems

Robotic systems used in automotive factories play a critical role in improving the efficiency of production lines. Robots and automation systems are widely used in processes such as assembly, welding, painting and quality control. Mechatronics Engineers are involved in the design, integration and maintenance of these robotic systems.

Electric and Hybrid Vehicles

The development of electric and hybrid vehicles has further increased the need for Mechatronics Engineering in the Automotive Industry. Unlike conventional internal combustion engines, these vehicles require electric motors, batteries and complex energy management systems. Mechatronics Engineers work on the design and integration of these systems, developing new technologies to improve energy efficiency.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● MECHATRONICS ENGINEERING ●

Advanced Driver Assistance Systems

Advanced driver assistance systems are technologies that increase the safety of drivers and make driving more comfortable. These systems include adaptive cruise control, lane tracking assist, collision warning systems and automatic parking assistants. These technologies require a combination of complex sensors, cameras, radar systems and algorithms, and Mechatronics Engineers play a major role in their development.

Autonomous Vehicles

Autonomous vehicle technologies are one of the most exciting developments in the Automotive Industry. Fully autonomous vehicles require systems that can sense their environment, make decisions and act without human intervention. This is an area that requires a high level of integration and advanced algorithms, challenging the limits of Mechatronics Engineering.

Mechatronics Engineering is a critical field shaping the future of the Automotive Industry. The contributions of Mechatronics Engineers in areas such as electric and autonomous vehicles, advanced driver assistance systems and production automation increase the innovation capacity of the sector. For this reason, Mechatronics Engineers working in the Automotive Industry have to keep up with the ever-evolving technology. While increasing energy efficiency, these engineers must not compromise on safety and performance. They also face challenges in electromagnetic compatibility, heat management and durability. Therefore, the importance of Mechatronics Engineering in the Automotive Industry is increasing day by day and the skills and knowledge of engineers working in this field are becoming more and more critical.

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

5G AND BEYOND: USHERING IN A NEW ERA OF DIGITAL TRANSFORMATION – RES. ASST.SEVCAN BULUT

As the world of technology enters a new phase of digital transformation, 5G and beyond connectivity technologies are at the forefront of this evolution. With its high speed, low latency, and extensive bandwidth capacity, 5G has the potential to revolutionize everything from mobile communicationsto industrial automation. However, this is just the beginning; the possibilities enabled by 5G are seen as a precursor to future connectivity technologies.

Key Features of 5G and Its Innovations

5G offers significant advantages over previous generations of mobile communication technologies.One of its most notable features is the ability to achieve gigabit-level data transfer speeds per second,which means a much faster internet experience compared to 4G. Additionally, 5G's low latency makes real-time applications possible, which is crucial for critical applications like autonomous vehicles and remote surgery.

Another important feature of 5G is its extensive bandwidth capacity. 5G allows for a much larger number of devices to connect simultaneously, enabling systems that require dense connectivity, such as the Internet of Things (IoT), to operate efficiently. This opens up new opportunities in areas ranging from smart cities to industrial automation.

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6G: The Technology of the Future

Although 5G has not yet been fully deployed globally, scientists and engineers are already working on developing 6G technology. 6G promises even higher data speeds, ultra-low latency, and greater bandwidth compared to 5G. Moreover, 6G is expected to be integrated with artificial intelligence in a way that will enable entirely new applications.

With the advent of 6G, innovative applications such as digital twins, holographic communication, and augmented reality are expected to become a part of our daily lives. This technology has the potential to bring about profound changes not only in communication but also in sectors like healthcare, education, industry, and entertainment.

Economic and Social Impacts of 5G and Beyond

5G and future connectivity technologies are more than just technical advancements; they also bring about economic and societal transformations. The widespread adoption of 5G is expected to lead to increased efficiency, new business models, and innovation opportunities across various industries. Significant changes are anticipated, particularly in areas like smart cities, autonomous vehicles, and remote work.

However, integrating these technologies into society will require substantial infrastructure investments, regulatory frameworks, and efforts to address security concerns. Therefore, the successfuldeployment of 5G and beyond technologies will necessitate close collaboration between the public and private sectors.

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Conclusion

5G and beyond technologies stand as the new driving force of the digital age. These technologies have the potential to bring about profound changes not only in communication but in every aspect of societal life. In this exciting journey into the future, keeping pace with technological advancements and adapting to this transformation process will be crucial for both individuals and organizations.

FACULTY OF ENGINEERING AND ARCHITECTURE

ACADEMIC AND
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ACADEMIC AND SCIENTIFIC ACTIVITIES

● CIVIL ENGINEERING ●

Assist. Prof. Ahmad Reshad NOORI has been appointed as the acting Head of the Department of Civil Engineering.

Assistant Prof. Dr. Yasin PAŞA and Ph.D. Student Abdulbaki HACI published their article titled "The Effects of Low Impact Urbanization (LER) Practices on Urban Stormwater Drainage System" in the International Journal of Engineering Technologies.

Assistant Prof. Dr. Yasin PAŞA and Ph.D. Student Zaid Adil Abdulsahib Al-qazzaz published their article titled "Flood Frequency Analysis of Ceyhan Basin" in Van Yüzüncü Yıl University Engineering Faculty Journal.

Assistant Prof. Dr. Yasin PAŞA's graduate student Selin Ece ALTUN defended her thesis titled "Modeling of Storm Water Drainage Systems with Low Impact Urbanization Methods" and graduated.

ACADEMIC AND SCIENTIFIC ACTIVITIES

The conference papers titled "The Effects of Ground Water Table on the Bearing Capacity of Shallow Foundations: A Numerical Approach" prepared by research assistants in Civil Engineering Department, Res. Asst. Oğuzhan Murat HALAT, Bilge Sultan DEMİRTAŞ, Kemal ERTUNÇ ve Şeyhmus Can TUNÇ, was presented in the International 9th Socrates Health, Engineerıng and Applied Sciences Congress held in İstanbul Gelişim University on August 16-18, 2024.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● CIVIL ENGINEERING ●

One of our Civil Engineering academics, Res. Assist. Oğuzhan Murat HALAT, co-author of the paper titled 'Forecasting Analysis of Wind Speed Using Polynomial Regression and Artificial Neural Network' was presented at the 9th Socrates International Congress of Health, Engineering and Applied Sciences held at Istanbul Gelisim University between 16-18 August 2024.

One of our Civil Engineering academics, Res. Assist. Bilge Sultan Demirtaş presented her co-authored paper titled 'Investigating the Effects of EPS Geofoam Cushion on Seismic Performance of the Retaining Wall' at the 9th Socrates International Congress of Health, Engineering and Applied Sciences held at Istanbul Gelisim University between 16-18 August 2024.

ACADEMIC AND SCIENTIFIC ACTIVITIES

THE DEPARTMENT OF CIVIL ENGINEERING AT ISTANBUL GELISIM UNIVERSITY HAS ACHIEVED A SIGNIFICANT MILESTONE BY AWARDING ITS FIRST DOCTORAL DEGREE

The Department of Civil Engineering at Istanbul Gelisim University has achieved a significant milestone by awarding its first doctoral degree. Dr. Silda Ghazi Mohammed DOORI completed her doctoral thesis titled "DYNAMIC ANALYSIS OF AXIALLY SYMMETRIC HETEROGENEOUS PLATES USING THE FINITE ELEMENT METHOD IN THE LAPLACE DOMAIN" under the supervision of Assist. Prof. Dr. Ahmad Reshad NOORI. This thesis aims to theoretically investigate the static and forced vibration behavior of axially symmetric plates made of Functionally Graded Materials (FGM). In the thesis, the material properties were assumed to be isotropic, linear viscoelastic, or elastic, emphasizing the continuous variation of these properties along the thickness of the FG plate. Functionally Graded Porous (FGP) materials were utilized under static loading conditions, while FG materials were employed along the thickness in dynamic scenarios. The novelty of the study lies in the use of quadratic rectangular elements to analyze both the static behavior of FGP plates using the Finite Element Method (FEM) and the damped and undamped forced vibration behavior of FG axially symmetric plates using FEM in the Laplace domain, for the first time.

ACADEMIC AND SCIENTIFIC ACTIVITIES

The findings from this study were compared with existing literature and validated through FEM software results. A high level of agreement was observed between the results of the proposed model and those obtained through different methods.

Moreover, a paper derived from Dr. DOORI's doctoral thesis, titled "Static Response of Functionally Graded Porous Circular Plates via Finite Element Method," was published in the Arabian Journal for Science and Engineering, which is categorized as Q1 in Scopus. This publication further underscores the importance and value of the research at an international level.

We congratulate Dr. DOORI on her graduation from the Civil Engineering Doctoral Program at Istanbul Gelisim University and wish her continued success in her career.

ACADEMIC AND SCIENTIFIC ACTIVITIES

"AN INVESTIGATION OF THE IMPACT OF AUTONOMOUS VEHICLES ON TRAFFIC FLOW"

Istanbul Gelisim University Civil Engineering PhD Program has achieved another important success. Dr. Mehmet Çağrı KIZILTAŞ, one of the graduates of the program, successfully completed his doctoral thesis titled "AN INVESTIGATION OF THE IMPACT OF AUTONOMOUS VEHICLES ON TRAFFIC FLOW" under the supervision of Prof. Dr. Mustafa KARAŞAHİN. This study arouses great curiosity both academically and practically.

In the thesis, the effects of autonomous vehicles on traffic flow were examined in detail. Autonomous vehicle types and accelerations were determined by classification analysis in R Studio program, and perception response times were calculated in MATLAB and SPSS programs. The research revealed that autonomous vehicles have higher accelerations and shorter perception response times than conventional vehicles.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● CIVIL ENGINEERING ●

Four different types of autonomous vehicles were simulated in Vissim to analyze how traffic flow changes under various penetration rates. The results showed that autonomous vehicle penetration leads to significant improvements in parameters such as traffic patterns, average speed, distance traveled and traffic density.

This research provides important data for planning the integration of autonomous vehicles into traffic systems and provides a valuable foundation for future traffic systems.

We congratulate Dr. Mehmet Çağrı KIZILTAŞ on this important achievement and wish him greater success in the field of engineering.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● MECHATRONICS ENGINEERING ●

The conference papers titled "Forecasting Analysis of Wind Speed Using Polynomial Regression and Artificial Neural Network" prepared by one of the members of Mechatronics Engineering Department, Res. Asst. Tunay ACIMAN, was presented in the International 9th Socrates Health, Engineerıng and Applied Sciences Congress held in İstanbul Gelişim University on August 16-18, 2024.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● ARCHITECTURE ●

Department of Architecture lecturer Oluwagbemiga Dr. Paul Agboola's article titled "Enhancing Najran's sustainable smart city development in the face of urbanization challenges in Saudi- Arabia" was published in the Journal of Asian Architecture and Building Engineering. You can access the article from the link below.
https://doi.org/10.1080/13467581.2024.2358203

Department of Architecture lecturer Oluwagbemiga Dr. Paul Agboola's article titled "Exploring the symbiotic relationship between smart technologies and thermal comfort in urban environments" was published in the Social Sciences & Humanities Open. You can access the article from the link below.
https://doi.org/10.1016/j.ssaho.2024.100943

Burcu Korkut, Research Assistant at the Department of Architecture, presented her paper titled "Street Art as Urban Praxis: The Philosophy and Politics of Urban Space" at the RC21 Conference 2024 held in Santiago, Chile between July 24-26, 2024.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● ARCHITECTURE ●

In the 9th International Socrates Congress on Health, Engineering and Applied Sciences, Assoc. Prof. Türkan İrgin Uzun contributed with a total of three presentations, with our school's graduate Merve Savrunlu giving a paper titled "Analysis of Parametric Design Proposals from the Perspective of Daylight"; with our graduate student Kevi Beqiraj giving two papers titled "Transformations in the Housing Market of Tirana: Thirty Years of Free Market Economy in Albania" and "Urban Transformation and Its Impact on Green Areas: The Example of Bahçelievler Neighborhood in Istanbul".

Dr. Murat Arapoğlu contributed to the 9th International Socrates Congress on Health, Engineering and Applied Sciences with a paper titled "A Comparative Evaluation of The Entrance Facades of The Semahane Structures in The Galata and Bahariye Mevlevihanes" with his master's student, Architect Aybüke Alınak; and with two presentations titled "Analyzing The Relationship Between The Courtyards Of The First Three Selattin Külliye Mosque Courtyards Built After The Conquest and Other Spaces" with his master's student, Aleyna Sena Değirmenci.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● ARCHITECTURE ●

Our faculty member Assoc. Prof. İlke Ciritci and our graduate student Rabia Nur Ertuğrul participated in the 9th Socrates International Congress on Health, Engineering, Applied Sciences with their paper titled 'Archaeological Site Reception Center Formation Principles: Reception Center Design Proposal Based on the Example of Çobankale Excavation Site'.

Sites are opened to visitors after the necessary protection methods are applied to the historical remains unearthed after excavation operations. Before opening to visitors, the necessary service units for the local people and tourists who will come to the area must be considered. These service units are provided by maintaining and functionalizing unregistered or registered cultural assets within the site area or by designing a center in a suitable location around the site area. In the service units designed around the site area, attention must be paid to architectural design factors such as height, façade selection and compliance with regulations, which will not damage the historical texture, are easy to reach, contain sufficient and necessary service units, are respectful of the historical texture and are made with appropriate materials. This paper aims to discuss the prominent factors in the design of reception centers in archaeological sites.

• TAG •

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