

# SDG PROGRESS REPORT

on **SDG-9 INDUSTRY, INNOVATION and  
INFRASTRUCTURE**

**20  
21**



# SDG PROGRESS REPORT

ISTANBUL MEDENIYET  
UNIVERSITY

**Istanbul Medeniyet University  
Sustainability Office**

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<https://www.un.org/sustainabledevelopment/news/communications-material/>

## **Sustainable Development Report Maps**

<https://dashboards.sdindex.org/profiles/turkey>

## **SDG Statics**

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

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Investment in infrastructure and innovation are crucial drivers of economic growth and development. With over half the world population now living in cities, mass transport and renewable energy are becoming ever more important, as are the growth of new industries and information and communication technologies.

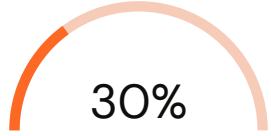
Technological progress is also key to finding lasting solutions to both economic and environmental challenges, such as providing new jobs and promoting energy efficiency.

Promoting sustainable industries, and investing in scientific research and innovation, are all important ways to facilitate sustainable development.

More than 4 billion people still do not have access to the Internet, and 90 percent are from the developing world. Bridging this digital divide is crucial to ensure equal access to information and knowledge, as well as foster innovation and entrepreneurship.

**2,3**  
MILLION

people are employed in the renewable energy sectors



30% of agricultural products undergo industrial processing in developing countries

**2,5**  
BILLION

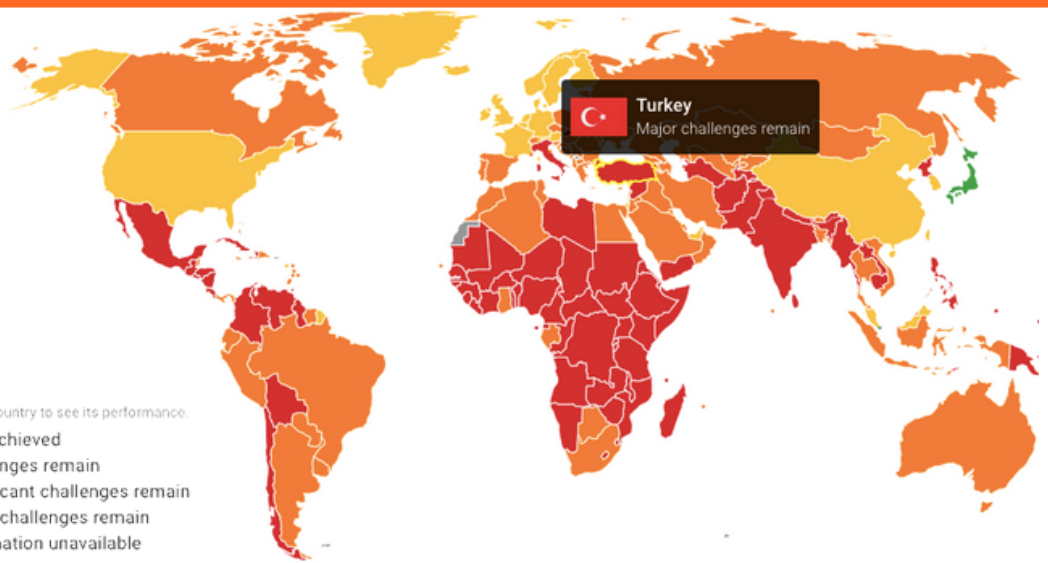
people lack access to basic sanitation



90% of people who still don't have access to the Internet are in the developing world

**2,6**  
BILLION

people in developing countries do not have access to constant electricity



**9.189.776€**  
**TOTAL**  
research income from industry and commerce



**601+**

Industry, Innovation and Infrastructure 2022 Rank in



**5%**  
**INCREASE**  
in the number of staff in the STEM field

**364%**  
**INCREASE**  
in research income from industry and commerce by medicine

# OPERATIONS

IMU

Istanbul Medeniyet University is committed to the mission of being an innovative and entrepreneurial world university that adds universal values to science, technology, and art. Founded on the five pillars of 'Innovative,' 'Entrepreneurial,' 'Society- and Civilization-Oriented', 'International', and 'Research-Oriented', our University has a **Technopark** to carry out its innovation activities; a **Technology Transfer Office**; an **Incubation Center**; 15 application and research centers; **2 research laboratories**, **7 service laboratories** and **30 R&D laboratories** within the **Science and Advanced Technologies Research Center**; and **5 department laboratories** operated by our departments.

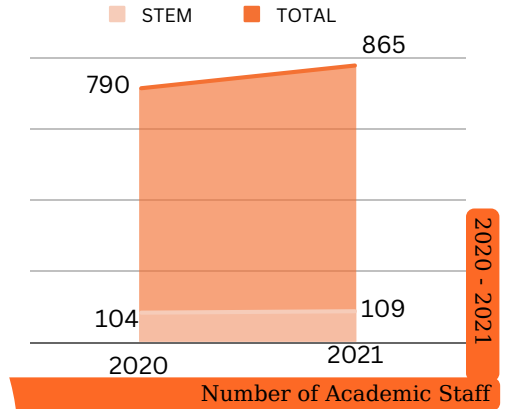


IMU **Scientific Research Projects Coordination Unit (BAP)** is in charge of selecting the scientific research projects, dissertation projects, and other projects conducted by our faculty members, to carry out the secretarial work for and finalizing the procedures for these projects, and to provide funds for scientific research projects. In this context, a total of **20 scientific research projects** were supported in 2021 with total funding of 1,442,308 TRY. Our BAP unit also informs our researchers about the projects supported by different institutions such as TUBITAK and ISTKA projects, EU Grant Projects, the projects supported by the Ministries of Youth, Culture, and Development, and SANTEZ projects and coordinates all the projects receiving support from other institutions.

**“1.442.308 ₺ FUND**  
given to our academic staff  
for their research projects”

Istanbul Medeniyet University has a **Technology Transfer Office (TTO)** which is in charge of licensing the technologies developed and produced within the institution and securing industrial collaboration. TTO carries out activities to protect and coordinate the intellectual properties developed by our faculty members, students or researchers and promotes the intellectual properties and technological products owned by the institution so that they can reach more users for further improvement.

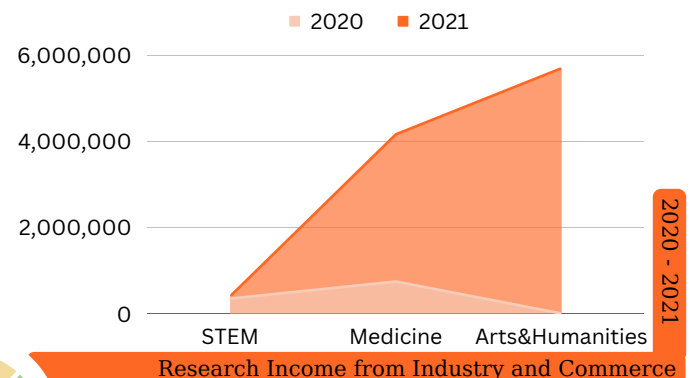
In 2021, the total number of our academic staff increased by 9%, while the number of our academic staff working in STEM fields increased by 5%.



As a result of the academic studies conducted by our academic staff members, **4 patent applications** were made in 2021 and one of these applications was finalized and **awarded with a patent** within the same year.

There are **4 R&D firms** that were founded/partnered by our academic staff members at least 3 years ago and that are still active.

The **research income** IMU earned from industry and commerce in 2021 yılında amounted to **TRY 9,189,776** of which 62% was earned from Arts&Humanities/Social Sciences and was followed by Medicine with 37% and STEM with 1% income. When compared to 2020, the highest increase in research income in 2021 was achieved in Medicine with an increase rate of 364%.



Istanbul Medeniyet University has a technopark that serves firms using or working on advanced technologies. In **IMU Technopark** located in Tuzla/ Akfirat, companies develop technologies or software; transform their technological inventions into a commercial product, method or service and thereby contribute to regional development. With a capacity occupancy of 100%, IMU Technopark houses 16 firms.



IMU Technopark

Istanbul Medeniyet University has an **incubation center** that supports all entrepreneurs and chiefly our students and academic staff members who would like to start their own business. IMU incubation center helps people gain the practical knowledge and skills required for this process and provides entrepreneurs with business ideas with entrepreneurship training programs, consulting support, office space, infrastructure services, and meeting halls.

Istanbul Medeniyet **University Laboratory Animal Facility (DEHAL)** was established within the body of our university's Science and Advanced Technologies Research Center (BİLTAM) in order to provide the husbandry and breeding services of laboratory animals needed in the fields of scientific research, testing and training in accordance with national and international standards. DEHAL, as a unit licensed by the Ministry of Agriculture and Forestry in the fields of research, breeding, use and procurement, provides high quality in vivo research infrastructure to academia and R&D institutions within the framework of legislation and ethical principles. All studies to be carried out within DEHAL are subject to the approval of IMU Animal Experiments Local Ethics Committee (HADYEK).

İMÜ **Tobacco and Tobacco Products Analysis, Research and Development Laboratory** was established according to the **collaboration protocol** between the Tobacco and Alcohol Department of the Ministry of Agriculture and Forestry and Istanbul Medeniyet University. In the world and in our country, the usage of tobacco and tobacco products is widespread and it has also become one of the most important public health problems due to the negative effects of the substances in its smoke on human health. In this laboratory, analyses are carried out during the production, export, import, and marketing of tobacco products. Our laboratory aims to contribute to the country's economy by ensuring that the analyses previously made abroad are carried out in the country. The internationally accredited laboratory also has the capacity to meet the analysis demands from abroad. The fact that the laboratory has been established within the university allows it to contribute to the research and development of existing tobacco and tobacco products analysis techniques.



IMU Science and Advanced Technologies Research Center

IMU BILTAM houses **7 service laboratories** that offer analysis, measurement, imaging, and equipment services for our academic staff members and students as well as **for all researchers**. Institutions or researchers can fill in a request form to have their analyses made; to perform their own analyses using the devices and 41 pieces of equipment provided or to attend the analyses performed as observers.

A collaboration protocol was signed between **BMC** and IMU concerning project development and execution and staff training on subjects to be determined according to R&D needs.

Learning processes are key in achieving SDGs. Thus, universities play a critical role both by training professionals who will prioritize SDGs in their future practices and by increasing local, national, and global capacity to successfully achieve SDGs. As Istanbul Medeniyet University, we are fully aware of our critical role and thus aim to empower and motivate for SDGs not only our students through course contents, co-curricular activities, and student club activities, but also the community at large at a much wider scale. Therefore, we organize university-wide life-long learning activities, online courses, certificate programs, seminars, workshops, congresses, symposia, and panels that are open to all segments of society for participation. In 2021, we held a wide range of learning activities to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

### **"We Have our Say for the Future 2021: Savings and Efficiency Symposium"**

organized by Üsküdar Directorate of National Education with the contribution of Istanbul Medeniyet University was held online on January 14, 2021. Two faculty members from the Faculty of Engineering and Natural Sciences, Prof.Dr. Sevda AVCI and Assoc.Prof.Dr. Hasan KÖTEN, made presentations on **"Saving in Technology"** and **"Efficiency and Technology Production"**. They mainly examined the issues of efficiency and savings under the sub-themes of education, technology and human resources and discussed how to use resources efficiently in the technologies produced. In this context, they drew attention to the importance of using every resource that humanity has very efficiently and making it sustainable in an economical way. The importance of product innovation was also emphasized.

### **"Human Health Effects of Biotechnology and Organ Regeneration"**

The event on **"Human Health Effects of Biotechnology and Organ Regeneration"** organized by the Biotechnology Club of our university was held online on March 23, 2021. Assoc.Prof.Dr. Barış BİNAY attended the event and made a presentation about the biotechnological applications carried out in the past and today's applications. He emphasized that possible applications in the future will contribute to production innovation and humanity in the diagnosis and treatment of human diseases.

IMU Medeniyet Gemisi Student Club held the SpeakUP event in partnership with University4Society. The event titled **"The Place of Entrepreneurship in Turkish Economy and its Contribution to Foreign Trade"** was held with the participation of Hakan ÇINAR on March 16, 2021. At the event, the sustainable development goals of decent jobs and economic growth were highlighted. In this context, the concepts of small and medium entrepreneurs were brought to the fore in order to achieve improvement in areas such as sustainable growth, higher economic productivity level and industrial innovation in Turkey. The necessary conditions to keep up with the changing world order and the current conditions in our country were shared.



Organized by Istanbul Medeniyet University Molecular Biology and Genetics Student Club, **"IMUGEN'21 DAYS"** event was held online on March 22-29, 2021. In the event, which was held with the presentations of our expert scholars on different topics, it was ensured that the participants achieved innovative gains in the field of genetics. Assoc.Prof.Dr. Necla BİRGÜL İYİSON attended the event with a presentation on "GPCRs as drug targets" within the scope of realizing product innovation in the pharmaceutical industry. Asst.Prof.Dr. Beyza GÖNCÜ talked about the current approaches in Parathyroid Transplantation, which is one of the affordable and sustainable treatment methods providing an innovative approach in treatment processes. Prof.Dr. Arzu ÇELİK FUSS provided information about the innovations in the health industry achieved through the use of a two-winged insect species called *Drosophila Melanogaster* in the field of molecular genetics.



An **Introductory Course on Robotic Coding** was delivered to our students as part of the "Life Skills Development Workshops" organized by the Department of Health, Culture, and Sports of our University to support our students' vocational development. A total of 190 students from our University who applied online participated in the free course delivered as part of vocational training. The course was held online on 31 March-1 April 2021 and 7-8 April 2021 and delivered by Ferdi DUMANDAĞ, a student of IMU Electrical and Electronics Engineering and head of IMU Robotics Club. In the course, the concepts of robot and robotics were defined along with their historical development and the types of robots were introduced. Industrial and product innovation in the sector was also investigated.

The **"3th Medeniyet Technology Days"** event, organized by the Medeniyet Techno Student Club of our university, was held online on May 8-9, 2021. Within the scope of supporting domestic technology development, research, and innovation for industrial diversification and increasing value in industrial products, the event started by a presentation by Selda AYDOĞMUŞOĞLU. She talked about the importance of cyber security in technology and drew attention to its role in the development of secure networks and infrastructure. Then, Ömer CENGİZ made a presentation on Artificial Intelligence and touched upon many topics such as the importance of artificial intelligence, its development from past to present, the areas where it is used and its place in product innovation. Later, Emre YAZICI made a presentation about Data Science and mentioned that it has a very important contribution to the growth of the technology industry with its role in the processing of big data emerging in the developing and consuming world.



Medeniyet Teknoloji Günleri 3

Speaker	Topic	Date	Time
Selda AYDOĞMUŞOĞLU	CYBERSECURITY SUBJECT MATTER EXPERT	8 Mayıs	16.00
Ali ÇİFTÇİ	SOC. ANALYST AT CYBERWISE	8 Mayıs	17.00
Emre ÇÖZEN	SENIOR IOT ENGINEER AT ASELSAN	9 Mayıs	15.00
Ömer CENGİZ	AI INSTRUCTOR AT GLOBAL AI HUB	9 Mayıs	16.00
Emre YAZICI	CHIEF DATA SCIENTIST	9 Mayıs	17.00

Sertifika, Yarışma ve Sürpriz Ödüller.

İSTANBUL MEDENİYET UNIVERSİTESİ

Medeniyet Gemisi Student Club joined the **"Entrepreneurship BOOTCAMP"** held with University4Society whose main purpose is to train entrepreneurs and to grow small enterprise ideas with the right methods and Turkey's largest volunteer entrepreneurship ecosystem, on May 20-21-22, 2021. Entrepreneurship BOOTCAMP, which aims to provide vocational training that will help the participants who intend to produce technology-based solutions to the problems of society and have business ideas related to industrial innovations, to turn these ideas into a business model in real life, and also contribute to the entrepreneurship ecosystem in Turkey. In addition to the regular mentor support given to the students at the event; basic trainings were also provided on issues such as creating a business model, design thinking and making presentations to investors for R&D investment.

IMU Career Clb hosted Halit Buğra ÇELİK, from the field of textile, under the topic of **"Sustainable Fashion and Entrepreneurship"** at the event held online on October 20, 2021. ÇELİK said that they use certified nature friendly fabrics that do not go through stages that harm the environment in the production process, with the aim of being a brand that produces products that cause minimal damage to nature and realizes sustainable manufacturing. He stated that their goal is to reduce the impact on global climate change by producing products with materials suitable for recycling. In addition, he underlined that they are trying to minimize environmental damage by planting a tree for each product sold by the brand.



SÜRDÜRÜLEBİLİR MODA & GİRİŞİMCİLİK

Türkiye'nin Çevre Dostu ve Sürdürülebilir Moda Markası Placebo Originals

20.10.2021 Çarşamba 21.00

zoom

Etkinliğimiz zoom üzerinde yapılacaktır!

HALİT BUĞRA ÇELİK  
PLACEBO ORIGINALS CO-FOUNDER

@imukariyer

20 October 2021

Sustainable Fashion and Entrepreneurship



IMU Career Club organized an online event on November 5, 2021, and Adem KAYAR took part as a speaker with the topic of **"Industry 4.0 and Digitalization"**. KAYAR talked about the process and industrial innovations brought by applications such as smart reactor application, basket traceability application, bench traceability application and web robot application developed in factory automation systems and the importance of the economic productivity provided by these innovations in the industry. In the event, to which our students showed great interest, vocational training was provided to the participants with the important issues and experiences conveyed by KAYAR, who is at the top of the profession.

Dr. Cem KINAY was the guest speaker of the **"Tourism in the Future"** Seminar, which was held online on November 11, 2021 by the Department of Tourism Management, Istanbul Medeniyet University Faculty of Tourism. In his speech, in which future tourism trends were the main theme, Cem KINAY shared information about experiences, sustainable living criteria and tourism of the future, as implemented in line with the United Nations' SDGs. Among the interesting concepts discussed the seminar were climate and environmental responsibility, cherishing and protecting the nature, sustainable agriculture and rural tourism, minimum carbon footprint, responsible consumption, innovation in tourism, local rural life and respecting, protecting and cherishing historical legacies, space tourism, holistic tourism, metaverse, virtual reality experiences, a new generation of life, technology, and digital funds, and new-generation hotel concepts.



The fourth of the **"Medeniyet Technology Days"**, organized by the Medeniyet Techno Club of our university, was held on December 16, 2021. Experts on topics such as artificial intelligence, machine learning, business analysis and mobile development were invited to the event held in our university. Ömer Ali ERDEMİR made a presentation on artificial intelligence, which has a great role in the realization of product innovation in the defense industry and the development of the economy in recent years. Also, Seda AGGEZ made a presentation on mobile application development and creating new jobs with the development of this sector. The event highlighted the technological progress that enables sustainable growth.



IMU Career Club organized an online event on December 27, 2021, and Canberk DEMİR took part as a speaker with the topic of **"Keeping Up With Digital Transformation"**. DEMİR emphasized that the field of software and digitalization constantly requires industrial innovations. In the event, to which our students showed great interest, vocational training was provided to the participants with the important issues and experiences conveyed by DEMİR, who is at the top of the profession. DEMİR also stated that the companies that have achieved success in the business world are companies that attach importance to product innovation and manufacturing innovation and closely follow the requirements of the age.



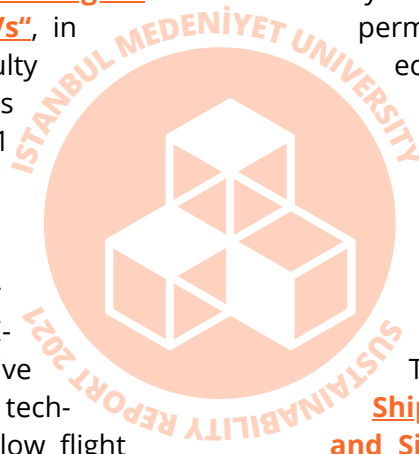


The academic staff members of our university carry out research on developing sustainable and resilient infrastructure with equitable access for all; promoting inclusive and sustainable industrialization; increasing access to financial services and markets; upgrading all industries and infrastructure to make them sustainable; enhancing scientific research and upgrading industrial technologies; facilitating sustainable and resilient infrastructure development in developing countries; supporting domestic technology development and industrial diversification; and providing universal access to information and communications technology, publish the results of their research and share them with other researchers, decision-makers, stakeholders, and the public as a foundation for policies toward achieving SDGs.

Support has been granted to the project titled **“Development of Multi-Purpose Intelligent Ground Station Software for UAVs”**, in which faculty members of the Faculty of Engineering and Natural Sciences took charge, within the scope of 1501 TUBITAK Industry R&D Projects Support Program. In the project, Assoc.Prof.Dr. M. Fatih HOCAOĞLU, Asst.Prof.Dr. İbrahim GENÇ from our university and Prof.Dr. İlyas KANDEMİR will take charge. As an innovative product of the rapid development of technology, UAVs stand out with their low flight costs and reachable area flexibility compared to airplanes and thanks to these characteristics of UAVs, this particular project aims to contribute to sustainable manufacturing. In this project, a very functional ground station software (Ground Control Software - YKY) and related telemetry protocol will be developed for the UAV. This software to be developed will create a functional and functional multi-UAV command, coordination and tracking package with the existing Scenario Development Tool software with the aim of industrial diversity. Thanks to the simulation and delegate models to be developed, scenarios that include completely virtual, completely real or both virtual and real models can be operated for the purposes of product innovation.

The project titled **“Agent-Based Production Systems Simulation Tool”**, in which faculty members of the Faculty of Engineering and Natural Sciences of our university took part, was deemed successful within the scope of 1501 TÜBİTAK Industry R&D Projects Support Program and was entitled to benefit from the grant fund. In the project, the faculty members Assoc.Prof.Dr. M. Fatih HOCAOĞLU, Asst.Prof.Dr. Murat GÜNGÖR and Asst.Prof.Dr. İbrahim GENÇ will take charge. A library has been developed that will enable the agent-based modeling and operation of the systems to be developed for the first time and existing production systems based on EtSiS (Agent-based Simulation System) interactively with real systems. It is aimed that the production system simulation model library will be a tool that allows the analysis of systems by taking into account Industry 4.0 requirements. Offering advanced technology, virtual processes and high innovation, Industry 4.0 provides sustainable stability, permanent value, economic growth, and economic efficiency. The project, which received R&D investment within the scope of supporting production activities, entrepreneurship, creativity and innovation, aimed for product innovation and production process innovation.

The project titled **“Development of Ship Engine Room Training Simulator and Simulator Design Software”**, in which faculty members of the Faculty of Engineering and Natural Sciences of Istanbul Medeniyet University took charge, was deemed eligible to be supported from the grant fund within the scope of 1501 TÜBİTAK Industry R&D Projects Support Program. The project will be carried out by Asst.Prof.Dr. İbrahim GENÇ and Assoc.Prof.Dr. M. Fatih HOCAOĞLU, along with Prof.Dr. Güven GONCA and Assoc.Prof.Dr. Görkem KÖKKÜLÜNK from Yıldız Technical University. The project aims at product and process innovation by manufacturing a domestic engine room training simulator for commercial and military ships which will be capable of simulating ship engine room and auxiliary systems and developing a simulator design program to simulate all kinds of ships. Also the project aims to contribute to domestic production by supporting creativity and innovation in production activities



**Four different projects** developed by students of our Electrical and Electronics Engineering Department under the advisorship of Asst.Prof.Dr. Haluk BAYRAM, have been accepted by the “TÜBİTAK 2209-A – University Students Research Projects Support Program”. The projects support innovation in technology. The projects consist of an UAV to support the creation of a forest inventory by taking aerial photographs of the determined regions, an UAV that is capable of autonomous navigation in the forest and a surface autonomous robot that will make water quality mapping.

The final year students of the Faculty of Engineering and Natural Sciences including Bahattin Ahmet BEDIRHANDEDE, Boron ZOROĞLU and Muhammet DEMIRKAN developed a **“Low-Cost Hearing Device”**. as part of their graduation project. They built a low-cost hearing aid designed to produce amplified sound for people with hearing loss. As a working principle, the device can be used as a telephone headset by receiving the sounds coming from the environment with a pre-amplifier microphone and converting them into electrical signals, then amplifying and converting these electrical signals back into sound. This innovative solution aims to improve the quality of life of people with hearing loss.

The project titled **“Determination of Biomarkers for Ankylosing Spondylitis Disease by Integrated Analysis of Genome-Scale Metabolic Models and Gene Expression Datasets”** conducted by Hatice Nur AYDIN, our student at the Faculty of Engineering and Natural Sciences under the consultancy of Asst.Prof.Dr. Muhammed Erkan KARABEKMEZ was entitled to receive support from TÜBİTAK 2209-A – University Students Research Projects Support Program. In the project, it was aimed to analyze the genome-scale metabolic models containing more than ten thousand reactions. In this way, active pathways and important enzymes were identified and new biomarkers for the diagnosis and treatment of Ankylosing Spondylitis were identified, contributing to process innovation.

The TEAM IMU FW team, consisting of our students from the student clubs of Field Robotics Laboratory and IMU Robotics Club, **participated and achieved the 3rd prize in the International Unmanned Aerial Vehicles Competition** held between September 13-18, 2021 as part of TEKNOFEST. The UAV system, specially designed and produced by the team for the competition, can perform fully autonomous take-off, cruise flight and landing missions in a disposable configuration. With the software developed by the team, target recognition and target positioning can be performed, and flight parameters can be followed in real time from the ground. The UAV produced with these features is important in terms of technological innovation and development.

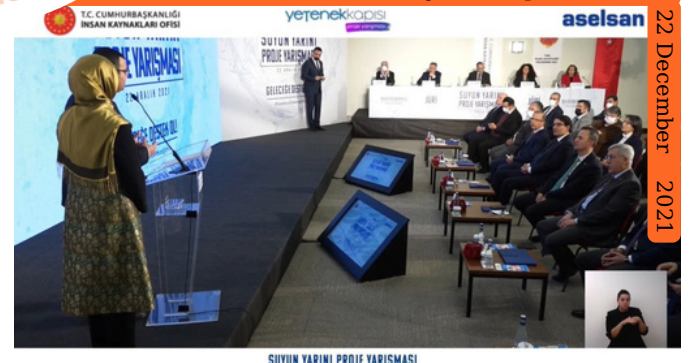


18 September 2021

Team IMU FW



## Future of Water Project Competition Final

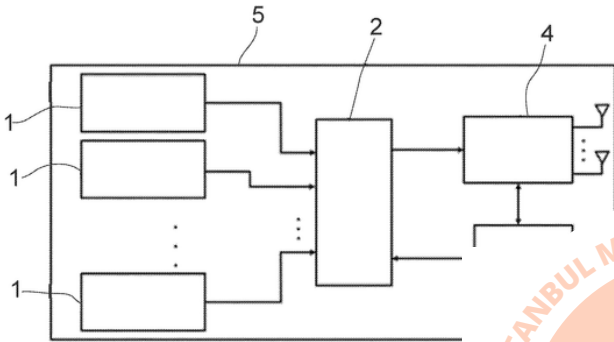


22 December 2021

Our students Şeyma Duymaz and Beyza Nur Aydoğan participated in the **Future of Water Project Competition Final** held at the ASELSAN campus on December 22, 2021 and **received an award** with their project titled **“Artificial Intelligence Control of Water Losses in Dams”**. The project aims to autonomously control water losses in dams using support vector machines, a machine learning technique and also bring infrastructural development. The project is different and innovative in that it is future-oriented, while current applications make instantaneous or retrospective analyses.

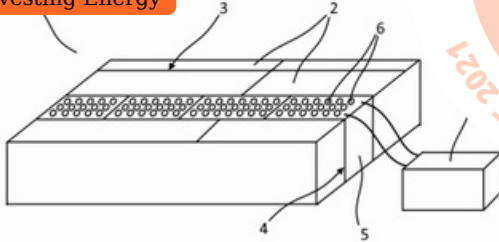


The invention titled **“Combined Multi-Source Energy Harvesting and Communication Management System”** developed by Asst.Prof.Dr. Doğay ALTINEL from the Department of Electrical and Electronics was found eligible for a patent by the US Patent and Trademark Office (USPTO) and the patent was registered on January 12, 2021. The patented system aimed to provide energy transition to wireless devices with a common energy harvesting method and to present a communication management solution. Along with energy efficiency, product innovation was also achieved by obtaining the energy used by the existing wireless devices in a more beneficial way.



Combined Multi-Source Energy Harvesting System

Concrete Roads and Grounds Harvesting Energy



An invention by Asst.Prof.Dr. Fatih ÖZALP, from the Department of Civil Engineering titled **“Concrete Roads and Grounds Harvesting Energy”** has been patented. The patent was registered by the Turkish Patent and Trademark Office on October 21, 2021. The project aims to meet this need and to achieve energy conservation by harvesting the energy caused by vibration on concrete roads or floors. Thanks to the piezoelectric transducer system positioned in the slots formed on the concrete blocks of the roads or floors that are the subject of the invention, it is aimed to harvest energy from the loads of the vehicles passing over them. Another goal of this innovation is to develop sustainable transportation.

An article by Dr. Gülfer VURAL of the Department of Economics titled **“Analyzing the impacts of economic growth, pollution, technological innovation and trade on renewable energy production in selected Latin American countries”** was published in Renewable Energy Journal. VURAL draws attention to renewable energy, eliminating the harmful effects of fossil fuels, and protecting the environment and addresses issues such as GDP per capita, carbon dioxide emissions per capita, technological innovation and trade as the determinants of renewable energy production for selected Latin American countries in the 1991-2014 period. The empirical analyses performed by the author revealed that GDP per capita, technological innovation and trade have a positive and statistically significant effect on renewable energy production per capita. The study has shown that carbon dioxide emissions and renewable energy production are negatively related.

The book titled **“Global Transformation in Energy System, Renewable Energy, and Public Policies”** authored by Asst.Prof. Dr. Dilek AKBAŞ AKDOĞAN from IMU Department of Public Finance was published. The author first explained how renewable energy sources are used as a tool in the fight against climate change and its effects within the framework of climate action plans of countries. Then, she emphasized the importance of renewable energy sources for economic goals such as sustainable economic growth and economic development, reducing unemployment, supporting infrastructural investments and encouraging product innovation. In the last and empirical part of the study, she carried out an analysis using panel data techniques to evaluate the effects and effectiveness of the incentive and support mechanisms applied by public authorities.

