TÜBA
Türkiye Bilimler Akademisi
Turkish Academy of Sciences

aassa
THE ASSOCIATION OF ACADEMIES AND SOCIETIES OF SCIENCES IN Asia

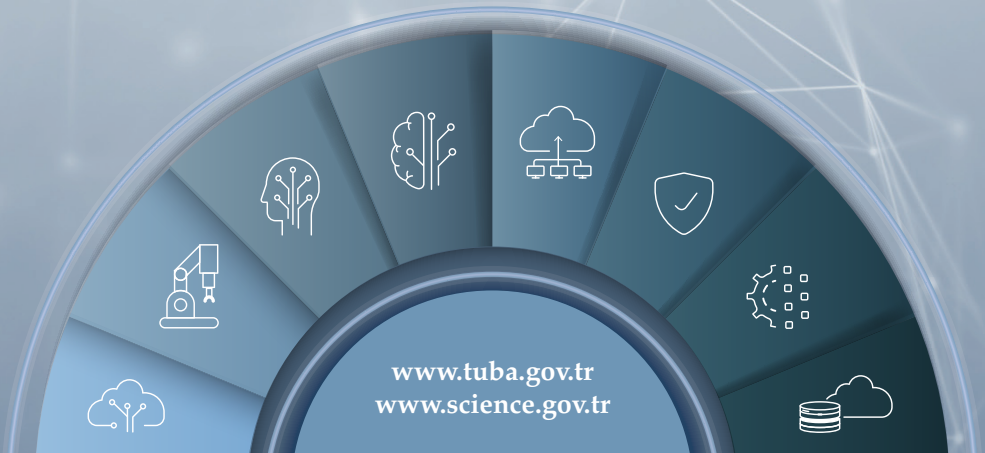
iap SCIENCE HEALTH POLICY
the interacademy partnership

Artificial Intelligence in Higher Education

11 - 12 May 2026

Ankara | Türkiye

Dedicated to the memory of Dr. Finarya Legoh



Foreword

Artificial intelligence has rapidly evolved from a specialized technological field into one of the defining forces shaping contemporary societies. Its influence now extends across education, scientific research, governance, healthcare, economics, and international relations. In particular, higher education institutions are undergoing a profound transformation as AI technologies increasingly affect teaching methods, research practices, academic governance, and knowledge production.

The TÜBA–AASSA International Symposium on Artificial Intelligence in Higher Education has been organized to address these opportunities and challenges through an interdisciplinary and international perspective. Bringing together distinguished scholars, policymakers, researchers, and institutional leaders from different countries, the symposium aims to foster scientific dialogue and strengthen international cooperation on the responsible integration of AI into higher education systems.

The symposium program covers a broad spectrum of topics, including AI-supported learning environments, intelligent tutoring systems, AI governance and regulation, interdisciplinary scientific discovery, academic ethics, digital infrastructures, accreditation processes, AI literacy, and future workforce development. These discussions underline the necessity of developing human-centered, ethical, transparent, and culturally sensitive AI frameworks within academia.

As artificial intelligence technologies continue to advance, universities and scientific institutions bear a critical responsibility not only to adopt innovation, but also to guide it responsibly in accordance with scientific integrity, ethical principles, and societal values.

We believe that this symposium will contribute meaningfully to the global discourse on AI in higher education and help establish new avenues for collaboration among academic institutions and scientific communities.

I would like to express my sincere appreciation to AASSA and IAP, all participating institutions, speakers, moderators, and contributors for their valuable support and participation.

I hope that the symposium will be fruitful, inspiring, and beneficial for all participants.

Prof. Dr. Muzaffer ŞEKER
President, Turkish Academy of Sciences (TÜBA)

InterAcademy Partnership (IAP) is a global network of science academies that promotes evidence-based policies, public health, science education, and sustainable development. Its members include more than 30,000 scientists, engineers, and health professionals from over 100 countries. Member academies are independent and merit-based institutions made up of leading scientists. They provide reliable scientific advice to governments and the public because they are free from political and commercial interests. IAP strengthens the international impact of these academies by creating a unified scientific voice. It supports the goals of sustainable development by publishing reports and recommendations on major global challenges. The organization also advises governments and international bodies such as the United Nations. In addition, IAP helps newer and less-experienced academies improve their ability to contribute to national and global discussions.

The Association of Academies and Societies of Sciences in Asia (AASSA) was established in 2012 through the merger of the Association of Academies of Sciences in Asia (AASA) and the Federation of Asian Scientific Academies and Societies (FASAS) to promote solidarity and cooperation among the scientific and technological academies in Asia and Australasia and to play a central role in cooperative efforts for further developing the region through science and technology. AASSA currently has a total of 34 member academies and societies representing 30 countries. It is one of the four Regional Networks of IAP, the Global Network of Science Academies.

Turkish Academy of Sciences (TÜBA) is an autonomous apex body for the development and promotion of sciences in Türkiye. The origins of the Academy go back to "Encümen-i Daniş" (Society of Scholars), which was founded in 1851 and known as the first Turkish science academy in the modern sense. TÜBA is the single national academy in Türkiye and it comprises all fields of sciences which are grouped under three categories namely a) basic and engineering sciences, b) health and life sciences, and c) social sciences and humanities. TÜBA contributes to the promotion of sciences through its working groups, grants and awards, scientific reports and collaboration with partner academies in the world.

Organizing Committee of the Symposium

• Prof. Dr. Muzaffer Şeker	Turkish Academy of Sciences
• Prof. Dr. Ahmet Nuri Yurdusev	Assocation of Academies and Societies of Sciences in Asia
• Assoc. Prof. Dr. Cem Korkut	Turkish Academy of Sciences & Ankara Yıldırım Beyazıt University
• Assoc. Prof. Dr. Mürsel Doğrul	Turkish Young Academy of Sciences & National Defence University
• Assist. Prof. Dr. Abdulkadir Taşdelen	Turkish Academy of Sciences & Ankara Yıldırım Beyazit University
• Assist. Prof. Dr. Musab Talha Akpınar	Turkish Academy of Sciences & Ankara Yıldırım Beyazit University
• Dr. Zeynep Aysan Şahintaş	Turkish Academy of Sciences
• Dr. Esra Zengin Gengörü	Turkish Academy of Sciences

Symposium Program

11 May 2026 – Monday

10:00 – 10:30 **Registration**

10:30 – 11:00 **Opening Speeches**

11:00 – 11:45 **Keynote Speech**
AI Based Smart Intelligent Tutoring Systems for ADHD and ASD Students with Autism Support Technologies
Prof. Dr. Muazzam Khattak, *Quaid-i-Azam University – Pakistan*

11:45 – 12:00 Coffee-break

12:00 – 13:30 **Session I:**
Regional and Global Perspectives on AI in Higher Education
Moderator: Prof. Dr. Muhsin Kar, *TÜBA Full Member*
Dr. Zeynep Aysan Şahintaş, *TÜBA*

From Consumers to Creators: Designing National AI Ecosystems for the Next Generation
Dr. Elvan Kuzucu Hıdır, *T3 Foundation – Türkiye*

Artificial Intelligence (AI) in Education and Scientific Research: Trends, Challenges, and Opportunities
Prof. Dr. Ilirian Malollari, *Academy of Sciences of Albania – Albania*

The Three Paradoxes of AI Adoption in Education in Türkiye and the Transformation of Generative AI Use into Learning Outcomes
Prof. Dr. Veysel Bozkurt, *İstanbul University – Türkiye*

Suggestions for AI-Supported Curricula in the New Era
Prof. Dr. Mehmet Kemal Özdemir, *İstanbul Medipol University – Türkiye*

13:30 – 14:30 Lunch

14:30 – 15:15 **Keynote Speech**

Artificial Intelligence in Health Education and Biomedical Research: Bridging Innovation and Clinical Application

Prof. Dr. Mohamed Hadi Habaebi, *International Islamic University Malaysia – Malaysia*

15:15 – 16:15 **Session II:**

AI Integration in Universities: Opportunities and Challenges

Moderator: Assoc. Prof. Dr. Kevser Çınar, *Necmettin Erbakan University – Türkiye*

From Policy to Practice: Integrating AI into Engineering Education at METU

Assoc. Prof. Dr. Hande Alemdar, *Middle East Technical University – Türkiye*

AI-Driven Interdisciplinary Scientific Discovery in Data-Intensive Biological Systems

Prof. Dr. Md. Shamsuzzoha Bayzid, *Bangladesh University of Engineering and Technology – Bangladesh*

AI-led Science Communication Strategies Vis-À-Vis Science Policies in India: Analyzing and Assessing Various Initiatives

Prof. Dr. Manoj Kumar Patairiya, *Science Communication National Institute of Advanced Studies – India*

Development of Academically Based Digital Resources for Improving the Application of Artificial Intelligence Technologies for the Azerbaijani Language

Dr. Tunjay Habibbayli, *Azerbaijan National Academy of Sciences – Azerbaijan*

16:15 – 16:30 Coffee-break

16:30 – 18:00 **Session III:**
Building AI Talent for the Knowledge Economy
Moderator: Prof. Dr. Mehmet Akif Kireçci, *Presidential Security and Foreign Policy Council, TÜBA International Relations Study Group*

Upskilling the Future: Bridging the AI Literacy and Microcredentials
Prof. Dr. Aras Bozkurt, *Anadolu University – Türkiye*

Integration of Large Language Models in Intelligent Tutoring System: Adoption and Ethical Aspects
Prof. Dr. Mirjana Ivanović, *Serbian Academy of Sciences and Arts – Serbia*

The AI Infrastructure Landscape
Prof. Dr. Özcan Öztürk, *Sabancı University – Türkiye*

AI-Supported Education and Accreditation Management in Higher Education
Prof. Dr. Muzaffer Elmas, *Kocaeli Health and Technology University – Türkiye*

12 May 2026 – Tuesday

10:00 – 10:30 **Registration**

10:30 – 11:15 **Keynote Speech**
Keynote Speaker: AI Regulations – A Global Overview
Assoc. Prof. Dr. Alina Andreica, *Babes-Bolyai University – Romania*

Keynote Speaker: Synergizing AI and Energy Transitions: A Roadmap for Sustainable Development in the Philippines
Prof. Dr. Alvin B. Culaba, *National Academy of Science and Technology – Republic of Philippines*

11:15 – 11:30 Coffee-break

11:30 – 13:00 **Session IV:**

AI Governance, Policy, and Strategic Alignment in Higher Education

Moderator: Prof. Dr. Mehmet Emin Aydın,
Necmettin Erbakan University & TÜBA Full Member
Assist. Prof. Dr. Abdulkadir Taşdelen,
TÜBA & Ankara Yıldırım Beyazıt University

Progress and transformation of Artificial Intelligence in Education
Prof. Dr. Ercan Öztemel, *Marmara University – Türkiye*

From Threat to Tool: AI-Integrated Assessment as a Solution to Two Problems at Once
Prof. Dr. Yusuf Sinan Akgül, *Gebze Technical University – Türkiye*

Global Perspectives and Innovative Energy Dimensions and AI Options
Prof. Dr. İbrahim Dinçer, *Yıldız Technical University – Türkiye*

From Automation Threat to Deep Complementarity: The Polarization of AI Use in Occupations in Türkiye
Prof. Dr. Halit Yanıkkaya, *Gebze Technical University – Türkiye*

13:00 – 13:30 **Evaluation Session**
Prof. Dr. Muzaffer Şeker, *TÜBA President*
Prof. Dr. Ahmet Nuri Yurdusev, *AASSA President & TÜBA Full Member*
Prof. Dr. Mehmet Akif Kireçci, *Member of the Presidential Security and Foreign Policy Council, Member of the TÜBA International Relations Study Group*
Prof. Dr. Mehmet Emin Aydın, *TÜBA Full Member & Necmettin Erbakan University*

13:30 – 14:30 Lunch

14:30 – 17:00 Social Event

-Keynote Speech

AI Based Smart Intelligent Tutoring Systems for ADHD and ASD Students with Autism Support Technologies

Noor Ullah, Muazzam A. Khan Khattak, Raushan Yeltinova, Almagul Assainova, Dariya Abykenova

Prof. Dr. Muazzam A. Khan Khattak
Quaid-i-Azam University, Pakistan
muazzam.khattak@qau.edu.pk
https://orcid.org/0000-0001-6140-1201

Abstract

Smart solutions based on AI are slowly changing the nature of educational tutoring and autism assistance. We have conducted a scoping review of 16 recent articles (2024-2025) discussing two primary topics: (i) intelligent tutoring systems (ITS) powered by AI, and (ii) AI-based applications for support of autism spectrum disorder (ASD). Generative AI tutors and chatbots, which are typically based on large language models such as ChatGPT or GPT-4, have been implemented in class to provide students with personalized feedback, mutually adapt learning materials on demand, and on-demand assistance. The findings reveal that these AI tutors are capable of enhancing student in- volvement, writing achievements, and elevated learning outcomes in general, yet the effectiveness differs based on the frequency of using them and the prior knowledge of the learners. In autism support, machine learning tools, including transformer-based models and neural networks, have been able to work great with early ASD detection with behavioural cues, physiological data, and neuroimaging. Novel AI techniques such as a Public Health- Driven Transformer, which targets social skills have performed better than the conventional therapies, by significantly improving social interactions and skills acquisition.

Keywords: *Intelligent tutoring systems, generative AI tutors, autism spectrum disorder, early ASD detection, transformer-based models*

Biography

Prof. Khattak (Member NADRA Authority Board) listed among top 2% highly cited scientists of the world in 2024 and 2025 and Gold Medalist of Pakistan Academy of Sciences-COMSTECH Prize 2025. Currently he is serving as Director Farabi Center for Artificial Intelligence and Cyber Security, Director Science & Tech / Director ICESCO Chair Data Analytics and Edge Computing, Quaid i Azam University, Islamabad. He is also Chairperson of UNESCO National IFAP Committee. Earlier he served as Associate Dean Computing and Head Postgraduate Program at SEECS, NUST. He received his PhD in a sandwich from IIUI and University of Missouri (UMKC), USA. He also completed his postdoc from University of Missouri (UMKC), USA in 2016 and joined them as an adjunct Professor. He has published more than 230 publications, 03 books and 16 book chapters with total citations of 6900 and h-index of 45. His research interests include Artificial Intelligence based smart solutions for different research problems in Internet of Things, IoVs, IIoTs, Smart Cities, Information security.

He is also serving as adjunct professor at USAK University, Turkiye, Baku State University, Azerbaijan, Harbin Institute of Technology, China and Margullan University, Kazakhstan. He has been awarded with the Pakistan Academy of Science-COMSTECH Gold Medal in Computer Science (IT), best performance award by the Minister of education in 2023 and Performance based awards at NUST from 2015 to 2019. In 2024 he was nominated for the prestigious civil award Tamgha-e-Imtiaz in 2024. He has been awarded with grants of Rs. 1.7 billion by the Ministry of Education, Kazakhstan, British Council, University of Missouri, USA, USAK University, Turkiye, and Margullan University, Kazakhstan.

He is also a member of the International advisory board, USAK University, Türkiye and Baku State University, Azerbaijan, Xidian University, China, Member Senate MUST University, AJK and senior member of Pakistan Academy of Sciences. He is a master trainer in IPFP and train in the trainers program by NAHE, Higher Education Academy, HEC Pakistan.

From Consumers to Creators: Designing National AI Ecosystems for the Next Generation

Dr. Elvan Kuzucu Hıdır
T3 Foundation
elvan.kuzucu@turkiyeteknolojitakimi.org
https://orcid.org/0000-0003-1341-2429

Abstract

When artificial intelligence is built entirely outside a country's borders, the consequences extend beyond technology language, culture and local knowledge gradually disappear from the digital world. For this reason, developing a national AI ecosystem is not an advanced option but a fundamental need. T3 Foundation has approached this challenge not through a single intervention, but through a connected ecosystem: from early science education in Bilim Türkiye Centers to hands-on technology training in Deneyap Workshops, from TEKNOFEST competitions to the open-source T3 AI initiative. Each component is designed around one core principle young people learn better, think more critically, and engage more responsibly when they are given the tools to build, not just to browse.

This presentation will share how T3 Foundation has put this principle into practice across Türkiye, with measurable outcomes in youth participation, digital literacy and early-stage innovation. It will also address what it means to design AI governance from the ground up through verified digital identities, algorithm-free social platforms and open-source language models developed with cultural inclusivity in mind.

Keyword: *T3 Foundation, artificial intelligence, TEKNOFEST, digital literacy, open-source innovation*

Biography

Elvan Kuzucu Hıdır was born in Aksaray in 1992. After graduating from Meram Science High School in 2010, she earned a nationwide ranking and received a full scholarship to study Electrical and Electronics Engineering at Bilkent University. During her undergraduate studies, she served as president of the Robotics Club and graduated with High Honors in 2015. She continued her master's degree at the same university, receiving support from the Ministry of Industry and Technology and a TÜBİTAK scholarship, and graduated with High Honors in 2017. The same year, she began her PhD studies at Istanbul Technical University as a research assistant and completed her doctorate on Reconfigurable Intelligent Surface-Assisted Communication Systems. She has contributed to various research projects and published papers in international journals and conferences. Since 2018, she has served on the Executive Board of TEKNOFEST technology competitions and currently leads the T3 Foundation while also serving on the Turkish Space Agency Board.

Artificial intelligence in education and scientific research — Albanian approach; trends, challenges and opportunities

Prof. Dr. Ilirian Malollari
Academy of Sciences of Albania
ilir.malo@gmail.com
https://orcid.org/0009-0009-4720-4653

Abstract

This paper examines the role of artificial intelligence (AI) in engineering education and scientific research in Albania, with a focus on trends, challenges, and opportunities. The study adopts a qualitative, desk-based comparative methodology, drawing on academic literature, policy documents, institutional reports, and selected Albanian case studies to assess the current state of AI integration in higher education and research. The analysis focuses on three interconnected dimensions: AI-supported learning in engineering education, AI as a tool for scientific productivity and innovation, and the governance mechanisms required for responsible use in Albanian universities and research institutions.

The study is based on several assumptions. First, AI can enhance student engagement, personalize learning, improve assessment, and increase faculty and research productivity. Second, Albania's ongoing digital transformation and education reforms provide a favorable context for AI adoption. Third, the benefits of AI will only be sustainable if accompanied by strong academic integrity, data protection, ethical guidance, and institutional readiness. The paper also assumes that regional cooperation in the Western Balkans can strengthen shared capacities, harmonize standards, and support joint research and innovation ecosystems.

The findings indicate that AI has significant potential to improve engineering education, accelerate literature analysis, optimize research workflows, and foster interdisciplinary innovation. However, the Albanian context also reveals important barriers, including limited AI literacy, uneven institutional capacity, unclear governance frameworks, and risks related to plagiarism, undisclosed AI assistance, and weak transparency in authorship. The study concludes that AI should not be treated merely as a technological tool, but as a strategic enabler of educational quality and scientific development. For Albania, the

successful integration of AI depends on human-centered policies, faculty and student training, ethical regulation, and stronger alignment between universities, industry, and national and regional policy frameworks.

Keyword: *Artificial intelligence (AI), higher education, engineering pedagogy, scientific research, academic integrity, digital transformation, western balkans, human-centered policy.*

Biography

As an Academician and Professor at the University of Tirana, Ilirjan Malollari is a distinguished authority in chemical and environmental engineering. With a career spanning over four decades, he has made foundational contributions to industrial process modelling, simulation, and sustainable waste management. A prolific scholar, he has authored over 10 scientific monographs, more than 25 teaching textbooks, and over 580 scientific papers, establishing a significant body of work that bridges theoretical engineering with practical environmental solutions. Professor Malollari's commitment to academic mentorship is evident in his supervision of numerous doctoral and master's dissertations, as well as his extensive pedagogical experience in developing fundamental engineering curricula. Beyond his research and teaching, he actively shapes the field through leadership in international scientific societies and as a coordinator for major research projects. An expert in process digitisation and computer-aided engineering, he remains dedicated to advancing chemical engineering education and innovative industrial practices.

The Three Paradoxes of AI Adoption in Education in Türkiye and the Transformation of Generative AI Use into Learning Outcomes

Prof. Dr. Veysel Bozkurt
İstanbul University
vbozkurt@istanbul.edu.tr
https://orcid.org/0000-0001-7623-3132

Abstract

Generative artificial intelligence has rapidly become widespread in educational settings. However, its impact on learning depends on how, by whom, and within which digital tools this technology is used. This paper examines the transformation of generative AI into learning gains in Türkiye using microdata from the Turkish Statistical Institute's 2025 Household ICT Usage Survey and Eurostat 2025 indicators. The analytical strategy proceeds in four stages. Weighted descriptive analysis, latent class analysis (LCA) of pre-AI digital tools, weighted logistic models of transformation capacity, and comparative European positioning. Three key findings emerge. First, Türkiye exhibits a sharp cohort wall regarding overall adoption. Second, while overall adoption lags significantly behind the EU, the share of AI users directing its use toward formal education is similar to or higher in Türkiye. Third, a five-class LCA solution identifies a small but significant class of Generative Digital Actors. More than half of this class uses generative AI, and its focus on education is at the highest level. This class concentrates the country's transformation capacity. The article introduces the concept of AI Transformation Capacity, situates the findings within the context of the third-level digital divide and digital capital theory, and offers recommendations for higher education institutions.

Keyword: *Generative AI in education, AI transformation capacity, digital divide, digital capital, learning outcomes*

Biography

He continues to serve as a professor in the Department of Sociology of Economics at the Faculty of Economics, Istanbul University. His research areas include sociology of work, social values, the societal impacts of artificial intelligence, and research methods. He graduated from Uludağ University, Faculty of Economics and Administrative Sciences in 1984. He completed his master's degree (1986) and PhD (1991) at the Institute of Social Sciences of the same university. Throughout his career, he has worked as a visiting researcher and faculty member in various countries.

Among Prof. Bozkurt's works are Sociology in a Changing World (18th edition, 2024), Industrial and Post-Industrial Transformation: Knowledge, Economy and Culture (2005), Information Society and Türkiye (3rd edition, 2000), and The New Work Ethic (2000). He has also served as an editor of several books, including The Societal Impacts of COVID-19: A Transnational Perspective (2021), Society in the COVID-19 Pandemic: Inequalities, Challenges, and Opportunities (2021), Cultural Life in Istanbul in Difficult Times (2024), and Artificial Intelligence in Education (2025).

Suggestions for AI-Supported Curricula in the New Era

Prof. Dr. Mehmet Kemal Özdemir
İstanbul Medipol University
mkozdemir@medipol.edu.tr
https://orcid.org/0000-0002-9054-0005

Abstract

The impact of AI across many different fields is becoming increasingly evident. Every day, we hear reports that AI is either approaching or surpassing the level of human performance in various professions. This inevitable change is here to stay, and new graduates need to be better equipped to work with this powerful tool. Instead of resisting or defending against AI, we should embrace its potential and use it to achieve future goals. At the core of this transformation are universities, which must quickly integrate fundamental AI courses into the curricula of all departments, especially non-technical ones. Many universities around the world have already begun this transition, and we now see the emergence of interdisciplinary programs such as Philosophy and AI or Psychology and AI. While establishing new departments is a valid approach, an alternative is to enrich existing curricula with foundational AI courses. One possible model is to introduce six core AI courses for each department, with more technically oriented departments offering additional AI-related courses. One of these courses could be a project-based course focused on applying AI within the relevant field, enabling graduates not only to use AI tools but also to partially develop AI-based systems. For example, a School of Medicine could offer AI courses focused on medical imaging and data analysis, while a School of Law could emphasize large language models (LLMs) for processing vast amounts of legal documents efficiently. This curricular transformation must happen rapidly, as the pace of AI development is extraordinarily fast.

Keywords: *AI, university education, inter-disciplinary, curricula, enginnering*

Biography

Dr. Ozdemir completed his BSc and MSc in electrical engineering at METU, Ankara Türkiye in ‘96 and ‘98 in, respectively. He received his PhD from Syracuse University, Syracuse, USA in ‘05 from electrical engineering. He obtained his two-year Business Management from University of Toronto in ‘10. Between ‘99 and ‘13 he has worked in industry in the area of broadband communication with the focus on CATV systems, 4G wireless systems, and cloud solutions. In 2008, he joined CSI, a broadband telecom service provider, as a VP of Engineer and lead the team of engineers in providing contemporary testing solutions for the broadband equipment. In parallel to this full time work, Dr. Ozdemir also taught undergraduate and graduate courses at University of Ontario, Oshawa, Canada, where he was also an adjunct professor. Between ’13-17, he worked as an assistant professor at Istanbul Sehir University, Istanbul,Türkiye. Later, he was appointed as the chair of EE department. Currently, Dr. Ozdemir works at Istanbul Medipol University as a full professor. He is the chair for the artificial intelligence engineering department and also holds the position of associate dean. Dr. Ozdemir’s research interests are secure wireless link designs, receiver algorithm designs for 5G systems, AI applications for communication systems and most recently Odor Sensing. Dr. Ozdemir is the representative from Türkiye for Cost Action INTERACT focusing on 5G and beyond systems.

-Keynote Speech

Artificial Intelligence in Health Education and Biomedical Research: Bridging Innovation and Clinical Application

Prof. Dr. Mohamed Hadi Habaebi
International Islamic University Malasia
habaebi@iium.edu.my
https://orcid.org/0000-0002-2263-0850

Abstract

This keynote explores the transformative integration of Artificial Intelligence (AI) within the dual frameworks of higher health education and biomedical research. As the medical landscape shifts toward digital precision, the presentation highlights how research-led innovations in AI can redefine diagnostic accuracy and pedagogical approaches. The methodology focuses on the development and deployment of Deep Convolutional Neural Networks (DCNN) for early-stage disease detection. A primary focus is placed on breast cancer screening via Infrared Thermography (IRT), evaluating the performance of Inception v3, v4, and a modified Inception MV4 architecture. The latter was specifically engineered to optimize computational costs by balancing feature maps and pixel positions. The research further investigates the influence of tissue thermophysical characteristics and the use of in situ cooling to enhance thermal contrast. By integrating these models with mobile-connected infrared cameras, the framework achieves a detection accuracy of up to 99.7% in real-time video streaming environments. In addition to oncology, the presentation addresses AI applications in dental endodontics. By leveraging U Net variants and deep learning for the segmentation of 2D x-ray, 3D Cone Beam Computed Tomography (CBCT) data, and microCT imaging, the research facilitates the identification of complex root canal anatomies, including C- shaped canals and bifurcations. This technical foundation is complemented by an analysis of model robustness against noisy thermal data, ensuring clinical stability.

The keynote concludes that the synergy between AI research and health education acts as a catalyst for professional development. By transitioning from theoretical

models to “hands-on” digital diagnostics, AI serves as a critical co-pilot for the next generation of healthcare providers. These advancements not only reduce the reliance on invasive screening methods but also provide a scalable, low-cost framework for improving global health outcomes and interdisciplinary educational standards. However, few imperatives emerge: invest in workforce AI literacy, demand rigorous peer-reviewed evidence, enforce an ethical approach to biomedical TnL and research processes, and deliberately design workflows that optimize human-AI collaboration rather than replacement.

Keywords: *Artificial intelligence, deep learning, thermography, breast cancer detection, dental anatomy, higher education.*

Biography

Mohamed Hadi Habaebi received the B.Sc. degree in communication from the Civil Aviation and Meteorology High Institute, Sebha, Libya, in 1991, the M.Sc. degree in electrical engineering from Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia, in 1994, and the Ph.D. degree in computer and communication system engineering from University Putra Malaysia, Kuala Lumpur, in 2001. He is currently a full-time Professor with the Electrical and Computer Engineering Department and the former Head of the Department and the former Post Graduate Academic Advisor with International Islamic University Malaysia, where he also heads the research works on the Internet of Things. He has supervised many M.Sc. and Ph.D. students, published more than 400 articles and papers, and sat on the editorial boards of many international journals. He is actively publishing in wireless communication networks, IoT network security, and biomedical and health engineering with emphasis on Artificial Intelligence and blockchain technologies.

From Policy to Practice: Integrating AI into Engineering Education at METU

Assoc. Prof. Dr. Hande Alemdar
Middle East Technical University
alemdar@metu.edu.tr
https://orcid.org/0000-0002-1397-2146

Abstract

Artificial Intelligence is reshaping higher education by transforming not only what we teach, but how we teach, assess, and govern academic processes. While global discussions often focus on high-level opportunities and risks, the real challenge lies in translating AI strategies into scalable, ethical, and discipline-specific educational practices. In this talk, we present the ongoing AI-supported educational transformation at the Middle East Technical University Faculty of Engineering. Our work spans curriculum redesign, AI-assisted teaching and assessment, and the integration of AI literacy across engineering programs. We discuss concrete implementations such as incorporating AI tools into coursework, redesigning learning outcomes to reflect AI-era competencies, and developing new assessment models that balance productivity gains with academic integrity. We also reflect on key challenges, including faculty adaptation, student dependency risks, ethical considerations, and institutional governance. By sharing lessons learned from a leading engineering faculty context, this presentation aims to bridge the gap between conceptual discussions and actionable strategies for AI integration in universities. The insights contribute to the broader dialogue on responsible, scalable, and impactful adoption of AI in higher education systems.

Keywords: *Artificial intelligence in higher education, engineering education, generative AI curriculum transformation, AI literacy.*

Biography

Dr. Hande Alemdar is a faculty member and Vice Dean of the Faculty of Engineering at Middle East Technical University. Her academic work spans artificial intelligence, machine learning applications in engineering, computational modeling, and engineering education. In addition to her research activities, she leads institutional initiatives on curriculum modernization and AI integration in higher education. Her recent work focuses on embedding AI literacy into engineering curricula, redesigning assessment methods in the era of generative AI, and developing interdisciplinary educational frameworks aligned with emerging technological transformations. Dr. Alemdar has authored over 50 international publications and has participated in more than 10 completed research projects, including three international collaborations. She has also led several funded research projects. She has been actively involved in academic governance, accreditation, and strategic educational planning, with a particular interest in responsible and effective adoption of AI technologies in universities.

AI-Driven Interdisciplinary Scientific Discovery in Data-Intensive Biological Systems

Prof. Dr. Md. Shamsuzzoha Bayzid
Bangladesh University of Engineering and Technology
shams_bayzid@cs.buet.ac.bd
https://orcid.org/0000-0002-5640-0615

Abstract

Artificial Intelligence (AI) is transforming the process of scientific discovery, particularly in data-intensive domains such as bioinformatics and computational biology. The rapid growth of high-throughput technologies has resulted in large-scale, heterogeneous datasets—ranging from genomic sequences and transcriptomic profiles to emerging modalities such as connec tomics and spatial biology. The ongoing "big data revolution" in biology offers unprecedented opportunities to answer impactful biological questions, such as those related to the study of species evolution, genomics, and structural biology. However, realizing this potential requires

advanced computational resources and sophisticated computational methods to analyze these massive datasets with both accuracy and efficiency. Effectively leveraging AI in this context re-quires not only advanced computational methods but also the development of interdisciplinary research ecosystems and supportive policy frameworks within higher education. In this talk, I will present a perspective on how AI can enable a new paradigm of scientific inference, moving beyond predictive modeling toward mechanistic understanding and hypothesis generation. I will illustrate how combining algorithmic approaches with AI and machine learning (ML) can improve the reliability of scientific inference. I will also highlight emerging directions in foundation models for biological domains (e.g., RNA biology, connectomics), where large-scale representation learning offers new opportunities for capturing the "language" of life and accelerating discovery across domains. A key argument of this work is that AI-driven scientific discovery is inherently interdisciplinary and requires coordinated institutional support. This need is particularly pronounced in advanced research in bioinformatics and computational biology, which relies on sustained collaboration between biologists, computer scientists, and statisticians. Universities must therefore invest in interdisciplinary curricula, shared research infrastructure, and open science practices. In addition, governance mechanisms must address

issues of data quality, model transparency, interpretability, and ethical use of AI in research, including attention to data biases, model limitations, and broader societal implications. From a policy perspective, the challenges are particularly pronounced in developing and emerging economies, where resource constraints and skill gaps may limit the adoption of advanced AI methodologies. I will discuss strategies for building inclusive, equitable, and sustainable AI research ecosystems, including regional collaboration, capacity-building initiatives, and alignment between higher education, research, and national innovation policies. I will focus on how such interdisciplinary integration and policy-driven efforts can address longstanding challenges in different important branches of biology. Finally, I will reflect on the implications of AI-driven discovery for higher education and research ecosystems, with a particular focus on bioinformatics and computational biology. By aligning AI-driven scientific inference within a broader institutional, ethical and policy context, this talk aims to contribute to ongoing discussions on how higher education can harness AI to enable responsible, transparent, and inclusive scientific discovery across disciplines.

Keywords: *Artificial intelligence in scientific discovery, computational biology and bioinformatics, big data in biology, interdisciplinary research ecosystems, AI policy, ethics and governance*

Biography

He is a Professor in the Department of Computer Science and Engineering at Bangladesh University of Engineering and Technology (BUET), where he has served since January 2024, following roles as Associate Professor, Assistant Professor, and Lecturer. He earned his PhD in Computer Science from the University of Texas at Austin in 2016 under the supervision of Dr. Tandy Warnow and Dr. Joydeep Ghosh, after completing both his MSc and BSc in Computer Science and Engineering at BUET with outstanding academic performance, ranking first in his class. His research focuses on computational phylogenomics, machine learning approaches for protein and RNA analysis, large language models for biological sequences, and the genetic basis of diseases. He has received numerous prestigious awards, including the Fulbright Science and Technology PhD Award, the Bangladesh Academy of Sciences Gold Medal, and the Interstellar Initiative Early Career Investigator Award, and continues to contribute significantly to interdisciplinary computational biology research.

AI-led Science Communication Strategies Vis-À-Vis Science Policies in India: Analyzing and Assessing Various Initiatives

Prof. Dr. Manoj Kumar Patairiya
Science Communication National Institute of Advanced Studies
manojpatairiya@yahoo.com
https://orcid.org/0009-0008-3982-9891

Abstract

Artificial Intelligence is rapidly transforming the architecture of science, governance, and communication. Science policies increasingly recognize the importance of public communication, transparency, and innovation, whereas science communication strategies remain underrepresented and often disconnected from core science policies. The paper discusses that AI must serve as a central integrative force linking national science communication strategies with broader science, technology, and innovation (STI) policies. Particularly in the context of the Science, Technology and Innovation Policy 2020 - the study analyses how AI can enable adaptive, participatory, and data-driven science communication systems aligned with both domestic priorities and global best practices. The paper proposes a multi-pronged AI-ked policy framework and identifies strategic pathways for aligning science communication with national development goals and international expectations, i.e. SDGs. The relationship between science policy and science communication has historically been asymmetrical. Science policies have been focused on research, innovation, and technological advancement, science communication has often been treated as an auxiliary activity. However, in the contemporary knowledge society, this separation is increasingly unviable. AI has emerged as a transformative force capable of bridging this void. By enabling real-time data analysis, predictive modelling, and public engagement, AI offers unprecedented opportunities to integrate science communication into the core architecture of science policy. In India, the Science, Technology and Innovation Policy 2020 reflects a paradigm shift towards inclusivity, democratization, and societal engagement, while global science systems are moving towards more integrated, participatory, and digitally enabled communication models. The paper explores how AI can reshape science communication strategies in India, aligning with domestic priorities and global trends. India leads a multinational, multi-stakeholder Global Partnership on

Artificial Intelligence (GPAI), which aims to direct the responsible development and application of AI with a focus on human rights, inclusion, diversity, creativity, and economic prosperity. India joined the initiative in 2020, being a founding member of GPAI and was chosen to chair the GPAI Council in November 2022 serving as chair while organized GPAI International Forum in New Delhi in 2024. For science communication, AI promises to write poetry, science fiction, speech, radio, television, and film script, like human beings, redefining the future of information, education and communication. AI has become a full-fledged means of research and communication including SHARED (Science, Health, Agriculture, Risk, Environment, and Development) communication. More than half of the world uses social media as 5.07 billion (62.6%) people around the world use various social media platforms. According to a study, around 26% of social media users follow science-related pages, it shows that broadly a quarter of entire social media content is considered science-related as per the users' self-reported data. Most social media users see at least some science posts, with new scientific discoveries being the most common type of science content shared. While many users see science content, a significant portion may not trust or fully understand the information presented as it might be using AI. A study at BHU, South Asian University, and Leibniz Institute for Social Sciences has explored how scholarly research outcomes from India are covered on different social media platforms. The study supported by DST also compared India's trends with international patterns. The publication records were tagged under 14 broad disciplines: agriculture, arts and humanities, biology, chemistry, engineering, environmental science, geology, information sciences, material science, mathematics, medical science, multidisciplinary, physics, and social science. The study found that overall social media coverage of research output from India is 28.5%, whereas the world average is 46.7% (2019). These findings underscore a swiftly and continuously expanding overlap between social media and scholarly communication where use of AI on digital platforms in disseminating scientific information cannot be ruled out. While there is no significantly available data on science content created using AI platforms, current research suggests that while AI is increasingly used in scientific writing, particularly for tasks like data analysis, literature review, and manuscript preparation, most of the published scientific content still relies heavily on human intelligence, with an estimated AI-generated content around 20%, though, the figure is expected to grow significantly in the coming years as AI capabilities continue to develop. A recent survey indicated that most researchers are interested in using AI to assist with aspects of scientific writing, including

error detection, citation organization, and summarizing literature, suggesting a rising trend in AI usage in scientific communication. Focus on specific tasks currently include AI as primarily supporting tasks within the scientific writing process, like data analysis, not necessarily generating complete scientific articles independently. Concerns about accuracy and ethics are also expressed, while AI can be helpful, researchers need to carefully review AI-generated content to ensure accuracy and ethical aspects.

Keywords: *AI, science communication, science policy, education, governance*

Biography

Prof. Manoj Kumar Patairiya is a well accomplished scientist and communicator, with a blend of scientific, academic and administrative acumen and extensive domestic and global exposure. He specialises in biosciences, communication, and studied science policy at Harvard University. Contributed to academics, research, published large number of papers, authored popular science books, and has 2 patents to his credit. Served in government, nongovernment, academic, and international sectors and took initiatives for promoting science communication globally. Setup 24x7 Satellite TV Channel on agriculture, produced radio-TV serials on science, created innovative M.Sc. Ph.D. courses in science communication, conducted science communication training programs in 600 districts, served as Outstanding Professor, Academy of Scientific & Innovative Research, chaired AASSA's Special Committee on SHARE Communication, and works as Adjunct Professor in Science Communication at NIAS. Prof. Patairiya is honoured by prestigious national and international awards and fellowships for his outstanding contributions in science and communication.

Development of Academically Based Digital Resources for Improving the Application of Artificial Intelligence Technologies for the Azerbaijani Language

Dr. Tunjay Habibbayli, Habibulla Imranov, Aida Tagiyeva, Samir Alakbarli
Azerbaijan National Academy of Sciences
tunjayhabibbayli@anas.az
https://orcid.org/0000-0001-7381-9461

Abstract

The Azerbaijani language belongs to the Turkic language family and is agglutinative in structure. Within the framework of the Processing of Azerbaijani Words with Universal Functionality (SUFI) project carried out at ANAS, a three-dimensional model was developed and tested through a series of experiments to establish a "gold standard" that takes these linguistic features into account and improves the accuracy of Azerbaijani language processing by artificial intelligence.

Based on the analysis of these successful experiments, the formal structure of the main parts of speech in Azerbaijani was developed and implemented in a database format. In addition, 743 suffixes used in the language were identified and systematically classified.

The effective and highly accurate application of artificial intelligence Technologies to the Azerbaijani language depends not only on large-scale data, but also on the development of normative, structured, and scientifically reliable linguistic resources. The primary objective of this study is to establish a unified lexical-intellectual infrastructure for the Azerbaijani language and, on this basis, to develop AI solutions sensitive to the specific features of the national language.

At the initial stage of the project, key lexical resources—including the Explanatory Dictionary, Dictionary of Antonyms, Synonyms, Homonyms, and the Dictionary of Orthography and Orthoepy—were integrated into a unified, systematic, and multilayered lexical database suitable for machine processing. This database is currently being integrated into the information system of the sufi.anas.az platform, developed within the SUFI project and currently operating in test mode.

The scientific novelty of this approach lies not merely in compiling various dictionary resources, but in reorganizing them into a structure that is trainable for artificial intelligence, semantically interconnected, and normatively verified.

At the next stage, these resources are planned to be aligned with an open-source language model of the 32B class. The aim is to enable the model to systematically acquire not only vocabulary, but also grammatical rules, semantic relationships, stylistic norms, syntactic behavior, and context-sensitive usage patterns of the Azerbaijani language. Furthermore, incorporating literary texts and other written materials into the corpus will support the continuous expansion of the database and contribute to making the model's linguistic behavior more natural, accurate, and functional.

The current focus of the project is the field of education. The expected outcome is the development of a reliable intellectual ecosystem that enhances Azerbaijani language exam preparation, academic writing, mastery of language rules, and the advancement of digital learning tools. At the same time, the proposed approach establishes a sustainable scientific and methodological foundation for future technological applications of the Azerbaijani language.

Keywords: *Azerbaijani language, artificial intelligence, language models, digital dictionaries, educational technologies.*

Biography

He is a software developer with five years of professional experience in backend development and a strong academic background in information technologies. He is currently a Senior Specialist at the Azerbaijan National Academy of Sciences, Institute of Information Technologies, where he works in the Department of Digital Academy, AI, and Electronic Services, focusing on emerging trends in artificial intelligence and robotics. He holds a PhD in System Analysis, Control, and Information Processing (2024) from ANAS Institute of Information Technologies, a Master of Science in Information Technologies for Economical Activities (2020) from the Academy of Public Administration, and a Bachelor of Science in Information Technologies (2018) from ADA University. Previously, he worked as a Software Developer at PASHA Bank OJSC, maintaining backend systems and REST APIs using Java and Go, and at the State Customs Service, where he supported .NET-based systems and Android applications. He also served as an adjunct instructor teaching introductory programming courses and completed an internship at Azercosmos OJSC, focusing on Linux-based monitoring systems.

Upskilling the Future: Bridging the AI Literacy and Microcredentials

Prof. Dr. Aras Bozkurt
Anadolu University
arasbozkurt@anadolu.edu.tr
https://orcid.org/0000-0002-4520-642X

Abstract

In an era where the shelf life of knowledge is rapidly shrinking due to the exponential growth of artificial intelligence, fostering AI literacy through microcredentials has become a strategic necessity for professional resilience. As generative tools redefine industries, traditional multi-year degrees often struggle to keep pace with the real-time evolution of technical competencies, making microcredentials the essential bridge for agile upskilling. These bite-sized, verifiable credentials allow learners to master specific AI-driven content—such as prompt engineering, algorithmic ethics, or automated data visualization—in a flexible and targeted manner. By integrating AI-enhanced personalized learning paths with the precision of micro-certifications, individuals can demonstrate their current proficiency to a global workforce, ensuring that their skill sets remain relevant and adaptable. Ultimately, merging AI literacy with microcredentials transforms lifelong learning from a theoretical ideal into a practical, data-driven engine for career longevity in the post-digital age.

Keywords: *AI literacy, microcredentials, agile upskilling, post-digital pedagogy, lifelong learning.*

Biography

Aras Bozkurt is a researcher and faculty member at Anadolu University, Türkiye. With MA and PhD degrees in distance education, Dr. Bozkurt's work focuses on empirical studies in areas such as distance education, online learning, networked learning, and educational technology. He applies critical theories like connectivism, rhizomatic learning, and heutagogy to his research. Dr. Bozkurt is also interested in emerging research paradigms, including social network analysis, sentiment analysis, and data mining. Dr. Bozkurt's studies also cover the integration of artificial intelligence technologies into educational processes in the axis of human-machine interaction.

Integration of Large Language Models in Intelligent Tutoring System: Adoption and Ethical Aspects

Prof. Dr. Mirjana Ivanović
Serbian Academy of Sciences and Arts & University of Novi Sad
mira@dmi.uns.ac.rs
https://orcid.org/0000-0003-1946-0384

Abstract

Recently, e-learning systems have been experiencing additional possibilities and functionalities influenced by development of other key disciplines and methods of artificial intelligence. One of the most important segments in today's development and use of e-learning systems is content customization and personalization oriented towards increasing efficiency of learning. To personalize the learning process these systems must use various technologies, techniques, and methods for changing the learning effects, environment, and interface in adapting teaching materials to the needs of students. Intelligent tutoring systems (ITS) incorporating advanced and intelligent approaches can provide recommendations for good learning paths, personalize the content displayed to students, and improve adoption of such systems.

Emergent development of Generative artificial intelligence (GAI) and Large Language Models (LLM) highly influence and reshape education at all levels. Although LLMs have only been widely available in last several years they have had a significant influence on approaches to education, educational technology, and educational methodologies. Initial considerations heralded LLMs' enormous potential to generate content, engage learners in productive and challenging dialogue, and influence personalized learning, while also warning of challenges like accuracy, bias, ethical aspects, and so on.

Several points are important in examining the educational impact of LLM-based learning systems compared to "traditional" intelligent tutoring systems. Findings underscore the potential of LLMs to revolutionize education through personalized learning, while also addressing the critical need for rigorous evaluation and ethical deployment to ensure equitable and effective outcomes.

In this presentation a conceptual model of an ITS will be briefly demonstrated, which can be applied, with minor or major modifications, in various domains and courses. The emphasis will be put on showing the functionality of a specific prototype of this general system for learning the basics of the object-oriented programming language Java with possibilities of customization and material adaptation to achieve a high level of personalization. Additionally, we will discuss how to synthesize current achievements of LLMs in coding and programming to enhance functionalities of proposed ITS. Briefly will be considered possible implications for all participants in such educational environments: learners, teachers, and even educational institutions.

Keywords: *Intelligent tutoring systems, teaching programming, generative AI, automatic code generation*

Biography

Mirjana Ivanovic is a Full Professor at the Faculty of Sciences, University of Novi Sad, Serbia, since 2002, and a corresponding member of the Serbian Academy of Sciences and Arts since 2024. She is a member of the Board of Directors of the Institute for Artificial Intelligence Research and Development of Serbia. Mirjana has authored or co-authored 17 textbooks, 30 edited proceedings, 4 monographs, and more than 550 research articles on multi-agent systems, e-learning and web-based learning, applications of intelligent techniques (CBR, data and web mining), software engineering education, most of which are published in international journals and proceedings of high-quality international conferences. She has served as a member of program committees for more than 550 international conferences and has chaired numerous international conferences as general chair and program committee chair. Additionally, she has been an invited speaker at numerous international conferences and a visiting lecturer in Australia, Thailand, and China. As a leader and researcher, she has participated in highly regarded international projects.

The AI Infrastructure Landscape

Prof. Dr. Özcan Öztürk
Sabancı University
ozcan.ozturk@sabanciuniv.edu
https://orcid.org/0000-0002-6870-8430

Abstract

The 2026 AI infrastructure landscape marks a pivotal shift from basic chatbots to autonomous agentic systems. To understand this evolution, we must establish an intelligence hierarchy that differentiates traditional and Generative AI from Agentic AI models defined by their capacity for independent planning and seamless tool integration. A competitive analysis of frontier models, such as GPT-5.5 and Claude Opus 4.7, alongside open-weight rivals like Llama 4 and DeepSeek, reveals a market where cost-efficiency has become as vital as raw performance. However, the industry faces significant headwinds, including power grid instability, a forced transition toward synthetic data as human sources reach exhaustion, and the tightening grip of regulatory frameworks like the EU AI Act. This era is further defined by a "Capex Explosion", with frontier training costs now exceeding $1B. Exemplified by the $100B Stargate supercomputer project, this financial reality has forced Big Tech "hyperscalers" Amazon, Google, Meta, and Microsoft to pivot from asset-light software models toward massive investments in physical infrastructure, specifically high-end silicon, hyperscale data centers, and dedicated energy grids. Central to this shift is a restructured chip supply chain, where commercial GPU dominance now faces a surge in custom ASICs, such as Amazon's Trainium, which are manufactured by foundries like TSMC to bypass the escalating costs of off-the-shelf silicon.

Keywords: *AI models, hardware, AI infrastructure, GPU, agentic AI*

Biography

Dr. Öztürk has been on the faculty as a Professor at Sabancı University since February 2024. Prior to joining Sabancı in Spring 2024, he worked as a Professor in the Department of Computer Engineering between 2008 and 2024 at Bilkent University. His research interests are in the areas of parallel computing, hardware accelerators, quantum computing, processor design, and heterogeneous architectures. Even before Bilkent, he worked as a senior engineer at NEC, Intel, and Marvell. Dr. Öztürk has been recognized by Bilkent University Distinguished Teaching Award, Science Academy's Young Scientist Award, Fulbright Senior Researcher Award, Intel Research Award, Türk Telekom Research Collaboration Award, IBM Faculty Award, European Commission FP7 Marie Curie Award, and others. He received his Ph.D. degree from the Pennsylvania State University, the M.S. degree from University of Florida, and received the B.Sc. degree from Bogaziçi University, all in computer engineering.

AI-Supported Education and Accreditation Management in Higher Education

Prof. Dr. Muzaffer Elmas
Kocaeli Health and Technology University
muzaffer.elmas@kocaelisaglik.edu.tr
https://orcid.org/0000-0003-3202-6689

Abstract

Developed by Kocaeli Health and Technology University, the "Artificial Intelligence-Supported Education and Training System" aims to manage educational processes from program design to graduation in a data-driven, transparent, and continuously evolving structure. This system positions artificial intelligence as a decision support mechanism while offering a quality assurance structure where the real decision-maker is the academician. The basic stages of the system are structured as follows:

Program and Curriculum Design: Artificial intelligence supports the determination of program outcomes by analyzing employment trends, global standards, and future competencies. The curriculum is designed with a dynamic and interdisciplinary approach to ensure the achievement of these outcomes. • Course Preparation and Implementation: Before each semester, course curricula (learning outcomes, content, methods) are updated using artificial intelligence analysis. An active learning-focused model is adopted in the educational process. For example, in a 3-hour course, the following stages are applied: a pre-test to determine the level, a brief summary of the topic, 80 minutes of active learning with application questions generated by artificial intelligence, and a final evaluation. • Personalized Learning and Development: Each student's achievement level is determined through analysis following midterm exams. Students struggling receive personalized assignments, remedial work, and supportive suggestions from AI. • Graduation and Quality Assurance: Before graduation, student performance is comprehensively analyzed, and recommendations are provided regarding certifications and resources to address areas of weakness. The program is continuously improved through post-final reporting. Key benefits of the system include keeping educational programs up-to-date, verifying graduate competencies with data, simplifying accreditation processes, and improving educational quality by reducing bureaucratic burden.

Keywords: *AI-driven decision support, personalized data-centric learning, evidence-based quality assurance, dynamic and accredited curriculum, active learning-oriented education*

Biography

Prof. Dr. Muzaffer Elmas (1956, Giresun) is a Turkish academic specializing in civil engineering. He earned his bachelor's (1980), master's (1983), and PhD (1988) degrees from Istanbul Technical University. He began his academic career in 1980 as a research assistant at Sakarya Architecture and Engineering Academy, becoming assistant professor (1988), associate professor (1994), and professor (2000).

He served as Vice-Rector of Sakarya University from 2002, focusing on strategic planning, quality assurance, education, and institutional development. In 2010, he was appointed Rector, where he led major reforms in quality evaluation, accreditation systems, and international benchmarking. During his tenure, he coordinated processes related to the Türkiye Excellence Award, EFQM Excellence Award, Global Excellence Award, as well as EUA IEP and HEQC external evaluations, and oversaw accreditation for around 50 academic programs.

Prof. Elmas is a member of AFAD's Earthquake Advisory Board, the Council of Higher Education's Vocational Qualifications Institution, Chair of the Inter-University Council Education Commission, and a full member of TÜBA. Since 2022, he has served as Rector of Kocaeli University of Health and Technology.

-Keynote Speech

AI Regulations – A Global Overview

Assoc. Prof. Dr. Alina-Bianca Andreica
Babes-Bolyai University
alina.andreica@ubbcluj.ro
https://orcid.org/0000-0002-8808-2009

Abstract

In the framework of our digital society, the digital change and the emerging of AI technologies have become key global issues. As AI technologies have spread rapidly, ethical and regulatory aspects of AI usage have become of utmost importance. From a legal point of view, AI regulations are the tool that enables us to efficiently manage an ethical, adequate and responsible usage of AI technologies.

We analyse, discuss and compare AI regulatory perspectives based on the regulatory frameworks from the EU – the EU Act on Artificial Intelligence, US and Asian countries. We also address the regulatory AI framework in Türkiye. Within this framework, we perform an analysis of the EU AI Regulation, compare it with the US and Asian frameworks and discuss their impact and implications to a global 'digital geopolitics'. Many Asian countries have adopted a voluntary approach to AI regulations.

We analyse the principles introduced by the EU Act on Artificial Intelligence and their impact. The EU AI act regulates the market use of digital AI tools within the EU and services provided to EU destinations, leaving AI research free. The act's regulations put an emphasis on human and citizens' rights and non-discrimination and do not approve the use of digital AI tools which do not comply with these principles. The regulations are applied for EU companies and global companies which provide services to the EU.

We compare the EU approach related to AI regulations with the US and Asian frameworks, concluding in respect with the strong points and principles of each

approach. We also address AI regulatory tendencies in Türkiye. We conclude referring to the global impact and advantages of these regulatory frameworks with the view of building a global 'digital geopolitics'.

We also address topics related to the ethics of applying AI in education and potential means of developing student critical thinking while using AI tools.

We conclude revealing the most important results of the analysis, regarding the significant impact of EU AI regulations and ethics of using AI in education, comparing the EU AI framework with the US and Asian ones. Adequate regulations ensure an appropriate ethical usage of IT and AI technologies. We globally sustain, based on the analysis, that digital applications and technologies tend to reshape classical geopolitics from a new, digital perspective, which has to pursue ethical principles. This major goal can be reached only based on a global, inter- and trans-disciplinary and joint support of all society actors, including academia, public institutions, political actors, industry and companies and civil society.

Keywords: *AI regulations, AI ethics, EU AI act, DESI, UN digital compass.*

Biography

Alina Andreica is Associate Professor in Computer Science at the Faculty of European Studies, Babes-Bolyai University, Cluj-Napoca, Romania. She has been Head of BBU's ICT Department for 10 years and she currently manages the UBB Brazilian Cultural Centre Casa do Brasil, building cultural, academic and technological bridges between Romania and Brasil, with the support of the Embassy of Brazil in Bucharest. She received her PhD in Computer Science in symbolic computation with a thesis on abstract domains and categories. Her research areas cover symbolic computation & abstract type systems, design and implementation of software systems, IT management and information system implementation, information system integration and data interchange, impact of IT implementations in organizations and society, AI impact and ethics, AI regulations.

Synergizing AI and Energy Transitions: A Roadmap for Sustainable Development in the Philippines

Prof. Dr. Alvin B. Culaba
National Academy of Science and Technology, Republic of Philippines
alvin.culaba@dlsu.edu.ph
https://orcid.org/0000-0001-9588-0909

Abstract

As the global community accelerates toward the 2030 Sustainable Development Goals (SDGs), the convergence of Artificial Intelligence (AI) and renewable energy transitions has emerged as a critical driver for national resilience. This keynote address explores the strategic integration of AI-driven solutions within the Philippine energy landscape to foster a sustainable and inclusive future. The Philippines faces unique challenges: an energy demand projected to triple by 2040 and a geographic vulnerability to climate change. In response, the nation has launched the National AI Strategy Roadmap (NAIS-PH) alongside "Project CREATE," a comprehensive initiative focused on energy efficiency and smart grid integration. By leveraging AI for predictive analytics in solar-plus-storage systems and real-time grid management, the Philippines aims to transition from traditional fossil fuel dependency to a decentralized, self-healing "Smart Grid" architecture. Furthermore, as UNESCO Commissioner on Science and Technology, I emphasize the role of the Education Center for AI Research (E-CAIR) in bridging the talent gap. We posit that sustainable development is not merely a technological shift but a human-centric evolution. This involves utilizing geospatial AI for disaster risk mapping and AI-enhanced education to equip the workforce for a green economy. By sharing the Philippine experience, this lecture highlights how emerging economies can leapfrog traditional developmental stages through Science, Technology, and Innovation (ST&I). The synergy of AI and energy solutions offers a transformative pathway to achieving the SDGs, ensuring that technological progress remains anchored in environmental stewardship and social equity.

Keywords: *Artificial intelligence (AI), renewable energy transition, smart grid systems, sustainable development goals (SDGs), climate resilience*

Biography

Professor Alvin B. Culaba, Ph.D. is the Vice President of the National Academy of Science and Technology, Republic of the Philippines and the Commissioner on Science & Technology, UNESCO National Commission of the Philippines. He had served as Philippine Energy Adviser (2007-2010) and as independent board member of the Philippine Electricity Market Corporation (2014-2016). As an expert panel member of the Philippine Joint Congressional Commission on Science, Technology, and Engineering (COMSTE) he assessed the S&T competitiveness of the energy sector and was commissioned to undertake energy policy studies that led to the crafting of the country's energy twin-bill, the Biofuels Act of 2006 (RA9367) and the Renewable Energy Act of 2008 (RA9513). A multi-awarded and leading researcher in energy and environmental sustainability, he is amongst the top 2% of the world's scientist by Stanford-Elsevier. He sits as editorial board member and reviewer of prestigious international journals. He has delivered numerous keynotes and plenary lectures in international conferences and is a Visiting Scholar to universities in Asia, UK, and the USA. He was a former Executive Vice President of De La Salle University Manila, past Presidents of the National Research Council of the Philippines (NRCP) and the Philippine-American Academy of Science and Engineering (PAASE), USA. He is an ASEAN Engineer and Distinguished Professor of Mechanical Engineering and Director and co-founder of the Center for Engineering and Sustainable Development Research (CESDR) at De La Salle University Manila, Philippines.

Progress and Transformation of Artificial Intelligence in Education

Prof. Dr. Ercan Öztemel
Marmara University
eoztemel@marmara.edu.tr
https://orcid.org/0000-0001-8488-9991

Abstract

Artificial intelligence is undergoing a fundamental transformation over the years. Since the 1950s, human beings have been studying with developing intelligent systems. These developments have sometimes gained significant attention in the scientific community, while at other times, they have entered periods of stagnation when progress was not as expected. These periods of stagnation (known as AI Winters) have been overcome through the patient work of scientists, and with a series of developments leading to generative AI. AI has now become central to societies and human lives. As in every sector, it is triggering a significant transformation and change in the field of education. Distance learning with virtual teachers is becoming an integral part of life. With flipped learning, the sharing of knowledge gives way to the sharing of experience. One of the most important developments is personalized education. Artificial intelligence will be a key player in the development of educational materials tailored to everyone's own learning curve. When these developments are integrated with project-based learning, AI will become the driving force and guide of a benefits and value-generating process.

Keywords: *Artifcial intelligence, inteeligen tutoring systems, customized education, education system transformation, aai in education*

Biography

Ercan Oztemel is a Professor of Industrial Engineering working at Marmara University. His main areas of interest include artificial intelligence, simulation and modelling, intelligent manufacturing systems, management information systems etc. He already carried out various national and international projects which were covering wide range of areas including military, health, public services, manufacturing, transportation, education etc. He also served as;

- the scientific panel member of NATO SAS Panel,
- the steering Committee Member of Western European Armament Group-Research Cells CEPA 11 and CEPA 15.
- the member of decision board BTE of TUBİTAK.
- the chairman of the industrial Engineering division in Sakarya and Marmara Universities.
- the head of department of Industrial engineering in Marmara University
- as the deputy president of ÖSYM
- the member of the steering committee for KAMAG of TUBITAK
- consultant to various enterprises and companies.
- being associate editor, quest editor or reviewer of various scientific journals
- The mentor for industries promoting AI

He is the author and co-editor of a wide range of scholarly publications including books, papers, conference proceedings etc.

From Threat to Tool: AI-Integrated Assessment as a Solution to Two Problems at Once

Prof. Dr. Yusuf Sinan Akgül
Gebze Technical University
akgul@gtu.edu.tr
https://orcid.org/0000-0001-8501-4812

Abstract

Universities treating AI as a compliance problem are missing a larger opportunity. This talk presents a replicable assessment framework in which students are required to use AI tools and document their use critically, while personalized exams — generated from each student's own submission — ensure that only genuine understanding earns a good grade. The approach solves two long-standing problems simultaneously: it makes superficial AI use self-defeating without bans or detection software, and it delivers the individualized feedback and evaluation that personalized learning has always promised but that instructor workload has always prevented. AI, it turns out, is not just the disease — it is also the cure.

Keywords: *AI-integrated assessment, personalized examinations, AI education of the educators.*

Biography

Yusuf Sinan Akgül is Professor of Computer Engineering and Dean of the Faculty of Engineering at Gebze Technical University (GTÜ), Türkiye. He received his Ph.D. in Computer Science from the University of Delaware in 2000 and worked as Senior R&D Engineer at Cognex Corporation (USA) from 2000 to 2005, where he co-authored four U.S. patents in industrial machine vision. Since joining GTÜ in 2005, he has led the GTÜ Vision Laboratory and supervised more than thirty graduate theses across computer vision, medical image analysis, deep learning, and human motion analysis. He has authored over one hundred peer-reviewed publications and led numerous TÜBİTAK and EU-funded research projects. His current pedagogical interest centers on integrating generative AI into university-level assessment in ways that promote, rather than undermine, genuine learning.

Global Perspectives and Innovative Energy Dimensions and AI Options

Prof. Dr. İbrahim Dinçer
Yıldız Technical University & Ontario Tech University
ibrahim.dincer@ontariotechu.ca
https://orcid.org/0000-0002-7092-2102

Abstract

It is globally clear that humankind requires clean air, clean water, clean food, and clean energy. Of course, clean energy is more critical among these that it is a prerequisite for all and that anything one can do with energy will affect the rest of the humanity's essential needs. This makes clean energy a prime requirement where innovative energy solutions are required. It is also a known fact that energy is a key element of the interactions between nature and society and is further considered crucial for the environment and sustainable development. Many environmental issues are caused by or relate to its production, conversion, storage, transportation, distribution and consumption, for example, acid rain, stratospheric ozone depletion, and global warming/climate change. Recently, a variety of potential energy solutions, ranging from renewables to energy storage and alternative fuels to hydrogen have become apparent. It has also become evident that traditional energy options will not work out to manage the environmental challenges and sustainability issues unless one can bring innovative energy solutions. A key requirement is to go beyond traditional practices since these traditional ones have caused a variety of global issues. Innovative energy dimensions require smart energy solutions where artificial intelligence (AI) is a key tool to consider in the spectrum of energy from production to utilization by designing reliable and efficient systems, improving system performance and efficiencies, enhancing system automation, control and management, increasing resilience, facilitating energy transitions, managing system complexities, optimizing systems, reducing inefficiencies, controlling carbon challenges and environmental problems, managing energy logistics, handling energy workloads and demand & supply challenges, etc. The potential AI tools are essential to use in this regard, including machine learning, deep learning, data mining, digital twins and internet of things. This presentation will address all of the above listed energy dimensions with challenges, opportunities

and future directions and efficient and effective use AI tools and methods to achieve better sustainability. It will also discuss various other key aspects, e.g., global warming, green energy, energy-utilization patterns, policy and strategy development, energetic and environmental measures, innovations and new technologies, technology issues, infrastructure, alternatives, as well as life cycle assessment and its role, etc.

Keywords: *AI, education, energy, hydrogen energy, innovation, technology*

Biography

Ibrahim Dincer is a full professor of Mechanical Engineering and is well recognized for his pioneering works in the area of sustainable energy technologies. Dr. Dincer has authored/co-authored many books and book chapters, along with many refereed journal and conference papers, and he has chaired many national and international conferences, symposia, workshops and technical meetings. Dr. Dincer has delivered many keynotes and invited lectures. Dr. Dincer is an active member of various international scientific organizations and societies, and serves as editor-in-chief, associate editor, regional editor, and editorial board member on various prestigious international journals. Dr. Dincer currently serves as President for Hydrogen Technologies Association in Türkiye and Chair for Energy Working Group in Turkish Academy of Sciences. Dr. Dincer is a recipient of several research, teaching and service awards.

From Automation Threat to Deep Complementarity: The Polarization of AI Use in Occupations in Türkiye

Prof. Dr. Halit Yanıkkaya
Gebze Technical University
halityanikkaya@gtu.edu.tr
https://orcid.org/0000-0003-1542-0174

Abstract

The rapid integration of Artificial Intelligence (AI) into the labor market has shifted the academic discourse from job automation to task complementarity. This study investigates the determinants of AI adoption in the Turkish labor market by disaggregating usage into three distinct domains: professional (work), private, and educational. Utilizing occupational data mapped with O*NET cognitive skill requirements (creativity) and sociological indicators (occupational prestige), we reveal a highly polarized landscape of technological adoption. Logistic regression results indicate that AI use for work purposes exhibits strong skill-biased technological change. It acts as a deep complement to creative, high-prestige, white-collar occupations, with a four-year university degree serving as the primary adoption threshold. Conversely, AI use for private purposes demonstrates a democratized, consumption-oriented pattern where class divides dissipate, and adoption is driven primarily by younger demographics rather than occupational status. Crucially, when AI is utilized for learning and self-development, the hierarchical social standing and cognitive requirements of an individual's occupation become statistically insignificant. In the educational sphere, AI functions as a class-blind "great equalizer." Ultimately, these findings challenge monolithic narratives of AI-induced labor displacement, demonstrating that the digital divide is not absolute; rather, the sociological impact of AI is strictly dictated by whether the technology is deployed for production, consumption, or education.

Keywords: *Artificial intelligence, skill-biased technological change, occupational tasks, creativity, digital divide, Turkish labor market.*

Biography

Prof. Dr. Halit Yanıkkaya is a full professor and Head of the Department of Economics at Gebze Technical University, Türkiye. He earned his Ph.D. from the University of Delaware in 2001. He is a prominent economist specializing in growth, institutional economics, and industrial policies. Over a distinguished two-decade career, he has significantly advanced both academia and policy research. His recent work emphasizes the intersection of sustainability and economic development, focusing on the circular economy, global value chains, and the empirical role of trust. Furthermore, he deeply explores the economic impacts of artificial intelligence, particularly its polarization and deep complementarity across occupations in Türkiye. A prolific scholar, Prof. Yanıkkaya publishes in top-tier journals including World Development, Economic Modelling, and the Journal of Development Economics. Recognized with award-winning research and leadership in major international projects, his ongoing work shapes critical debates on governance, sustainability, and technological adaptation.

Notes:

Notes:


TÜBA
Türkiye Bilimler Akademisi
Turkish Academy of Sciences


aassa
THE ASSOCIATION OF ACADEMIES
AND SOCIETIES OF SCIENCES IN
Asia


iap
SCIENCE
HEALTH
POLICY
the interacademy partnership