ICAIS'24
International Conference on Artificial Intelligence Studies

"FUTURE TRENDS IN AI: ACADEMY MEETING WITH INDUSTRY"

Abstract Book

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Editors

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İSTANBUL GEDİK ÜNİVERSİTESİ YAYINLARI

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ICAIS'24 INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE STUDIES "FUTURE TRENDS IN AI: ACADEMY MEETING WITH INDUSTRY" ABSTRACT BOOK

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ICAIS'24
INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE STUDIES

Venue: Gedik University Kartal Campus
Date: November 9, 2024

Conference Hall

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Önsöz

Bilim ve teknolojinin hızla ilerlediği bu çağda, yapay zekânın (YZ) artık bilim kurgu hikayelerinden gerçek hayatın bir parçası haline geldiğini ve her geçen gün daha fazla alanı dönüştürdüğünü görmek hepimiz için heyecan verici. Bugün, yapay zekânın hayatımızdaki etkisi tartışmasız bir şekilde büyük bir ivme kazanmış durumda. Bu etkiler de tüm dünyada toplumsal, endüstriyel ve akademik alanlarda derinden hissedilmektedir.

Yapay zekâ, bilgi işlem gücü ve veri işleme kapasitesiyle bugün insanlık tarihindeki en önemli buluşlardan biri hâline gelmiştir. Yalnızca teknoloji ve mühendislik alanlarında değil, aynı zamanda sağlık, hukuk, ekonomi, tarım, sanat, eğitim, havacılık ve daha pek çok disiplinde çığır açıcı yenilikler ortaya koymaktadır. Yapay zekânın bu disiplinlere kazandırdığı yenilikler, hayatı daha verimli, daha güvenli ve daha konforlu hâle getirmekle kalmamakta, aynı zamanda toplumsal sorunlara çözüm bulma potansiyeli de sunmaktadır.

Ancak yapay zekâ teknolojilerini geliştirirken ve kullanırken dikkat edilmesi gereken bir başka önemli konu ise etik ve hukuki sorumluluklardır. Yapay zekâ sistemlerinin karar verme süreçlerinde adil, şeffaf ve hesap verebilir olmaları, üzerinde durulması gereken birincil önceliklerdir. YZ'nin potansiyel faydalarını maksimize ederken, toplumsal hakların korunması, bireylerin mahremiyetine saygı gösterilmesi ve insan haklarına riayet edilmesi gerektiği hiçbir zaman unutulmamalıdır. Bu noktada, hak, hukuk ve etik kavramları yapay zekâ ile harmanlanarak teknolojinin sorumlu bir şekilde geliştirilmesi ve uygulanması sağlanmalıdır.

Bu konferans, yapay zekâ teknolojilerinin yalnızca bilim insanları ve araştırmacılar tarafından değil, aynı zamanda sanayi, iş dünyası ve kamu sektörü tarafından da keşfedilmesi ve kullanılması gereken bir güç olduğunun altını çizmektedir. Bugün burada yapacağımız sunumlar, tartışmalar ve atölye çalışmaları, yapay zekânın gelecekte nerelere ulaşabileceğini, hangi sektörlerde daha fazla kullanılarak hayatı nasıl dönüştürebileceğini gözler önüne serecektir. Konferansımız, yapay zekânın hemen hemen her disipline dokunduğu gerçeği ile şekillendirilmiştir. Mühendislikten tıbba, hukuktan eğitime, tarımdan sanata kadar her alanda yapay zekânın sunduğu olanaklar, yenilikler ve bu alanlarda karşılaşılan etik ve hukuki sorumluluklar masaya yatırılmıştır.

Ayrıca, akademik çalışmaların yalnızca teoride kalmayıp, sektörlerle birleşerek pratikte de kullanılmasına olanak sağlayacak iş birlikleri oluşturmak bizim için kritik bir önem

taşımaktadır. Bu konferans, akademik dünyada üretilen bilimsel bilginin endüstrinin ihtiyaçları ile buluşturulmasına katkı sağlayacak, yeni iş modelleri ve projelere yol açacaktır. Sektör temsilcileri, buradaki bilimsel çalışmaları daha yakından takip ederek, geleceğin teknolojilerini bugünden keşfetme fırsatına sahip olacaklardır. Bu süreçte, geliştirilen her teknoloji ve yapılan her yatırımın, etik değerler çerçevesinde şekillenmesi gerektiğini de tekrar hatırlatmak isterim.

Yapay zekânın geleceği, sadece bugünkü gelişmelerle sınırlı kalmayacaktır. Her gün yeni bir buluşun ve keşfin habercisi olan bu teknoloji, yakın zamanda çok daha karmaşık problemleri çözme kapasitesine ulaşacaktır. Bu geleceği inşa etmek hepimizin sorumluluğundadır. Hem akademisyenler hem de sanayi temsilcileri olarak, yapay zekânın tüm alanlardaki kullanımını daha da ileriye taşımak ve bu teknoloji ile dünyayı daha yaşanabilir bir hâle getirmek için çalışmalarımız hız kesmeden devam edecektir. Ancak bu ilerleme sırasında, insan onuruna saygı, adalet, gizlilik ve güvenlik gibi temel etik prensipleri de göz önünde bulundurarak, teknolojiyi sorumlu bir şekilde kullanmalıyız.

Konferansın düzenlenmesinde emeği geçen herkese ve değerli katılımcılarımıza teşekkür ederken bu konferansın hepimize yeni kapılar açmasını ve yapay zekâ alanındaki bilgi, iş birlikleri ve etik duyarlılıkların güçlenmesini temenni ediyorum.

Saygılarımla,

Prof. Dr. Murat Köseoğlu
Konferans Başkanı

Preface

In this era of rapidly advancing science and technology, it is exciting to see that artificial intelligence (AI) has become a part of real life from science fiction stories and is transforming more areas daily. Today, the impact of AI on our lives has undoubtedly gained great momentum. These effects are deeply felt in social, industrial, and academic areas worldwide.

With its computing power and data processing capacity, artificial intelligence has become one of the most important inventions in human history. It has brought groundbreaking innovations in technology and engineering, health, law, economy, agriculture, art, education, aviation, and many other disciplines. The innovations that artificial intelligence brings to these disciplines not only make life more efficient, safer, and more comfortable but also offer the potential to find solutions to social problems.

However, another critical issue to be considered when developing and using artificial intelligence technologies is ethical and legal responsibilities. The primary priorities to be emphasized are that artificial intelligence systems are fair, transparent, and accountable in their decision-making processes. While maximizing the potential benefits of AI, it should never be forgotten that social rights must be protected, individual privacy must be respected, and human rights must be respected. At this point, the concepts of rights, law, and ethics must be blended with AI to ensure that it is developed and implemented responsibly.

This conference emphasizes that artificial intelligence technologies are a power that should be discovered and used not only by scientists and researchers but also by the industry, business world, and public sector. The presentations, discussions, and workshops we will hold here today will reveal where artificial intelligence can reach in the future, in which sectors it will be used more, and how it can transform life. Our conference was shaped by the fact that artificial intelligence touches every discipline. From engineering to medicine, law to education, agriculture to art, the opportunities and innovations offered by artificial intelligence in every field, as well as the ethical and legal responsibilities encountered in these fields, were discussed.

In addition, it is critically important for us to establish collaborations that will allow academic studies to be used in practice by merging with sectors and not just in theory. This conference will contribute to the meeting of scientific knowledge produced in the academic world with the needs of the industry and will lead to new business models and

projects. Sector representatives will be able to discover the technologies of the future today by following the scientific studies here more closely. In this process, I would like to remind you again that every technology developed, and every investment made should be shaped within the framework of ethical values.

The future of artificial intelligence will not be limited to today's developments. This technology, which heralds an invention and discovery every day, will soon reach the capacity to solve much more complex problems. Building this future is a responsibility we all share. As both academics and industry representatives, our work will continue unabated to further advance the use of artificial intelligence in all areas and to make the world more livable with this technology. However, during this progress, we must use technology responsibly, considering basic ethical principles such as respect for human dignity, justice, privacy, and security.

I would like to thank everyone in the organizing committee, as well as our valuable participants. I hope this conference will open new doors for all of us and strengthen knowledge, collaborations, and ethical sensitivities in the artificial intelligence field.

Sincerely,

Prof. Dr. Murat Köseoğlu
Conference Chair

The Influence of Digital Human Resource Management on the Sustainable Competitive Advantage

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ABSTRACT

Amid urgent economic pressures, societal inequalities, and environmental concerns like climate variability and dwindling resources, organizations are increasingly driven to adopt digital strategies in their operations to maintain long-term competitiveness. Digital human resource management (HRM), powered by artificial intelligence (AI), offers promising avenues for implementing these solutions. However, its ethical and effective deployment demands thorough examination to ensure it contributes to sustainable competitive advantages for organizations. This study aimed to investigate the profound impact of AI-enhanced digital HRM on enhancing sustainable competitive advantage in the context of a developing economy. We performed a multiple regression analysis to analyze data collected from a sample of HRM experts operating specifically within the business landscape of Bosnia and Herzegovina. The study results showed that AI-driven digital HRM has a pronounced and beneficial effect on sustainable competitive advantage, positively influencing operational efficiency, relational dynamics, and strategic effectiveness. This study enhances the body of literature concerning digital HRM and sustainable competitive advantage through empirical validation of how AI integration in digital HRM contributes to organizational competitiveness in a manner that promotes long-term viability. Furthermore, organizations can apply the insights from this study to strategically integrate AI-driven digital HRM into their operations, enhancing operational effectiveness, cutting costs, managing risks, improving decision-making, promoting collaboration among stakeholders, and effectively leveraging resulting benefits.

Keywords: digital HRM, artificial intelligence, AI, competitive advantage, sustainable competitive advantage

An Assessment of The Differences Between The Common Law and The Civil Legal System Regarding The Impact of Artificial Intelligence on Predicting The Outcome of Litigation

Deniz Onur Aras
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ABSTRACT

Although there are 193 member states of the United Nations, the judicial systems of countries generally follow either common law or civil law (continental law). In some jurisditions, elements of both systems coexist. Even though common law countries have legalized it recently, this system depends on court case law. In this system, judgments made by judges were applied to subsequent cases. Judges play an active role in shaping the legal system. In the common law system, written laws have increased in recent years. Even if these laws exist, judges interpret them according to the case law of previous cases. Therefore, in the common law system, each judge makes each case unique. On the other hand, the Continental European Legal System relies more on written legislation and gives less importance to case law.

The Continental European Legal System depends on laws that dictate how legislation is applied to case merits, the judicial process, and the admissibility of evidence in court. Since the introduction of artificial intelligence, it has been hypothesized that lawyers will be fired worldwide and robot judges with artificial intelligence will be employed. It has been reported that artificial intelligence is being used to solve cases in various countries worldwide, and it has demonstrated a high level of prediction accuracy. However, the qualitative and systemic differences between legal systems are not taken seriously. While algorithms that can incorporate different data for various legal systems can be developed, there may be debates about which data and how these algorithms will be evaluated and their consistency. In these discussions, the issue to be solved, the data entered and which data will be evaluated may differ across legal systems, and the consistency of prediction may vary. Our study will discuss whether there will be a difference between the Continental European Legal System based on laws and the "common law" legal system based on jurisprudence across legal issues with artificial intelligence and the case prediction rate.

Keywords: Artificial Intelligence, Civil Law, Common Law, Case Results

Artificial Intelligence Based Predictive Maintenance for Electric Buses

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ABSTRACT

Predictive maintenance (PdM) is crucial for optimizing the efficiency and minimizing downtime of electric buses. While these vehicles provide significant environmental benefits, they present challenges for PdM due to the complexity of the electric transmission and battery systems. Traditional maintenance approaches, often based on scheduled inspections, struggle to capture anomalies in the real-time CAN BUS data of electric buses which are multi-dimensional, and often complex to interpret. This paper focused on the development of AI models for AI-based PdM of electric buses, particularly TEMSA MD9. In the study, real-time CAN BUS data from five different buses, collected over two years, were used. This data underwent extensive pre-processing and multiple feature selection approaches (data-driven/domain-based) to develop datasets tailored to the architectural needs of the AI models. We employed a variety of neural network architectures and traditional classifiers including Long Short-Term Memory (LSTM) networks, Recurrent Neural Networks (RNNs), eXtreme Gradient Boosting (XGBoost), Support Vector Machines (SVM), Random Forests (RF) combined with the Sliding Window technique. Each model was fine-tuned using Grid Search and Random Search to optimize the hyperparameters, aiming to enhance the predictive accuracy. The performances of these models were assessed using standard validation metrics, while LIME and SHAP explainability tools provided insights into the influential factors of the highest-performing models' predictions. Moreover, the machine learning (ML) pipeline and developed models were transferred to the Azure cloud platform for integration into vehicle tracking systems and field applications. To address the challenges of integrating incremental data from diverse sources across different periods and resolving interpretation issues, we systematically applied ML pipeline processes and developed a novel graph-based factor analysis tool. This tool successfully categorized correlation relations of 180 continuous attributes (potential features) according to relation intensity and selected distinctive features that show significant variations by generating graph struc-

tures that demonstrate strong inter-feature relationships. We observed that data-driven (graph-based) feature selection outperformed the domain-based method in performance metrics. This study not only contributes to the advancement of predictive maintenance for electric buses but also provides best practices for industrial applications that are challenged by multi-dimensional, incrementally provided, and complex-to-interpret raw data.

Keywords: predictive maintenance (PdM), artificial intelligence (AI), machine learning (ML) pipeline, graph-based factor analysis, explainable artificial intelligence (XAI)

VisionSafeDrive: A Deep Learning Framework for Real-Time Drowsiness Detection and Driving Activity Recognition

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ABSTRACT

Despite significant advancements in vehicle safety technologies, traffic accidents caused by human factors—particularly driver drowsiness and distractions—remain a major challenge. Drowsiness slows reaction times and impairs decision-making, while distractions such as mobile phone use and other in-car activities further elevate the risk of accidents. To address these critical issues, this study presents VisionSafeDrive, a comprehensive deep-learning framework designed for real-time drowsiness detection and driving activity recognition, with a primary focus on enhancing driver safety. The framework leverages the Vision Transformer model, which has been shown to outperform the EfficientNet architecture in key performance areas. VisionSafeDrive is evaluated using two datasets: the Driver Drowsiness Dataset (DDD), with 41,790 images of drivers' faces, and the Driving Activities Recognition dataset, containing 10,766 images across five driving activities. Both datasets are split into training (70%), validation (15%), and test (15%) sets. Through extensive evaluations, Vision Transformer achieved a 99.9% success rate in detecting drowsiness, outperforming EfficientNet, which achieved a 99.3% success rate. Additionally, Vision Transformer demonstrated superior performance in recognizing various driving activities, including texting on the phone (F1-score: 0.9489 vs. 0.9174 with EfficientNet), talking on the phone (F1-score: 0.9588 vs. 0.9202), and turning (F1-score: 0.9920 vs. 0.9738), safe driving (F1-score: 0.9379 vs. 0.9414), other activities (F1-score: 0.9137 vs. 0.8598). These results highlight the Vision Transformer's capability to capture complex patterns and global context more effectively, leading to higher accuracy and reliability in real-time scenarios. VisionSafeDrive integrates these advanced image classification techniques to provide timely alerts and feedback, significantly reducing the risk of accidents caused by driver drowsiness or distracted behaviors. By offering a robust, scalable, and highly accurate solution, VisionSafeDrive represents a significant advancement in intelligent transpor-

tation systems, with the potential to greatly enhance road safety and prevent drowsiness-related and distraction-induced incidents.

Keywords: Driving activities recognition, Drowsiness detection, Deep learning, Vision transformer, EfficientNet

Evaluation Of The Use Of Social Media Networking Sites By Individuals With Special Needs

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ABSTRACT

Social networking sites have increased their popularity, and have been widely used among individuals with special needs recently. When national and international literature about the use of social networking sites among individuals with special needs is analyzed, it can be seen that they use these kinds of sites to make friends, chat, share photos, follow pages related to their hobbies, and play online games Nevertheless, individuals with special needs may be more vulnerable in protecting their online security and privacy than individuals with typical development. This situation also increases the risk for individuals with special needs to experience cyberbullying. To raise awareness, research on cybersecurity for individuals with special needs should be intensified.

In recent years, artificial intelligence has been applied in cyber security to protect individuals' personal information and ensure their online security, support secure social networking, and prevent malware. The fact that individuals with special needs are more likely to be exposed to cyber-attacks on online platforms compared to individuals with typical development increases the importance of using artificial intelligence in the cyber security field.

This research aims to find out whether individuals with special needs can protect their online privacy and security and to determine their level of competence in the knowledge of using social networking sites. In this way, it was aimed to examine the social networking sites used by individuals with special needs, to determine the artificial intelligence technologies needed in the field of cyber security to protect the privacy and security of individuals with special needs, and to express opinions in this direction.

The data collected from the participants will be analyzed using the descriptive analysis

technique from qualitative research models. Also, the data will be collected using an open-ended and closed-ended interview form titled "Use of Social Media Networking Sites" prepared by the researchers. The interview form will be applied to the research participants face-to-face or online. The number of participants was determined by 15 adolescents with special needs. The interviews with 5 individuals with special needs have already been completed and the interview plans with other participants have been created. For this reason, the research is in the data-collection phase. Amid the congress, the findings and results obtained will presented.

We believe this research will support the use of artificial intelligence in the cyber security field in special education and will serve as a resource for future research.

Keywords: Individuals With Special Needs, Artificial Intelligence, Online Safety, Online Privacy, Use Of Social Networking Sites, Cybersecurity.

Artificial Intelligence and Ethical Issues

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ABSTRACT

Today, technological advances continue unabated. One of the most important technological advances is the development of artificial intelligence (AI). The application of AI in both private and public sectors brings many advantages but also some disadvantages. One of the important problems that have emerged since the use of AI is how ethical this technology is. It is important to determine how AI carries out decision-making, who is responsible for guaranteeing the reliability of these decisions, and what ethical frameworks they include. In addition; discrimination, privacy, justice, transparency, and accountability issues are among the ethical problems that may arise during the use of AI systems. While AI has the potential to improve people's lives in many ways, it also has the potential to cause harm if not used ethically and responsibly. Responsible artificial intelligence is ethical, lawful, reliable, and beneficial. AI technologies take into account social values and ethical principles of benefit, non-maleficence, human autonomy, justice, and explainability; it must be developed, distributed, and used with an ethical purpose and based on respect for fundamental rights. The ethical use of AI is not only a technical issue but also a social and moral issue that requires the cooperation of all actors involved. In the context of AI, governments, companies, developers and users are actors who have important roles in the ethical use of this technology. Each of these actors has specific actions and responsibilities they can take to promote the ethical use of AI. Tools such as ethical impact assessment processes, user-centered design, ethical tests, ethical standards and frameworks, and AI education can be used to ensure the ethical use of AI. In this study, it was mentioned ethical challenges brought by the use of artificial intelligence and discussed what kind of ethical framework should be created for the responsible use of artificial intelligence. The study used a literature review to analyze existing research on the topic, and descriptive analysis was conducted to summarize the findings. At the end of the study, it was concluded that if the ethics of AI is to be put forward – which seems necessary- this ethics should be different from the traditional ethical theories and that this ethics should consist of a system of moral principles that aim to inform the use and responsibility of AI technology.

Key words: Artificial intelligence, ethics, ethical codes, ethical approaches, ethical problems.

Preprocessing Optimization for Enhanced Real-Time Detection and Tracking in Vision Systems

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ABSTRACT

Efficient object detection and tracking in real-time systems often encounter performance bottlenecks due to the high computational demands of the preprocessing pipeline. This issue is particularly critical in applications where both accuracy and real-time processing are essential, such as surveillance, autonomous driving, and robotics. In this study, the computational cost of the preprocessing function within the YOLOX + ByteTrack integration is addressed, as it previously imposed significant performance limitations, hindering the overall efficiency in tracking tasks. The preprocessing function was re-implemented using PyTorch tensors, leveraging GPU acceleration to significantly optimize the process. This approach allowed for a considerable reduction in preprocessing time while maintaining, and in some instances enhancing, the accuracy of both detection and tracking. The optimized method resulted in a significant improvement in FPS performance compared to the original implementation. Notably, these improvements were achieved without any loss in detection and tracking precision, ensuring the reliability and accuracy of the system. The proposed solution offers scalability for real-time applications where computational efficiency is critical, particularly in resource-constrained environments such as embedded systems and edge devices. The successful use of PyTorch tensor-based preprocessing demonstrates its potential as an effective optimization strategy. Future research could expand on these findings by applying similar optimizations to other components of the YOLOX + ByteTrack pipeline, further boosting overall system performance and paving the way for more efficient real-time object detection and tracking systems in diverse applications.

Keywords: Artificial intelligence, Deep Learning, Real-time object detection, ByteTrack, PyTorch tensor

Optimized Hybrid Approach for Age and Gender Estimation on Low-Cost Embedded Systems

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ABSTRACT

Age and gender estimation from body images has become a critical tool in various sectors, including retail analytics, public safety, and demographic research. Despite its growing importance, existing literature on this topic remains sparse, and many studies report low accuracy rates. One of the key challenges lies in extracting meaningful and consistent features from body images, which are often influenced by factors such as clothing, posture, lighting conditions, and body shape variations. To address these challenges, a new hybrid approach has been developed that combines state-of-the-art detection and classification algorithms, specifically designed to improve accuracy in this task. In the detection phase, the YOLOX algorithm, optimized with TensorRT, is utilized to ensure high-speed and accurate detection of human figures in real-time. YOLOX's ability to detect objects efficiently makes it ideal for real-world applications where performance is critical. For the classification phase, the well-established EfficientNet-Lite architecture is used in its ONNX-optimized form, known for its robust image classification abilities and efficiency on embedded systems. This architecture helps to classify the detected individuals into appropriate age and gender categories. The system has been deployed on a Jetson Nano embedded platform, a cost-effective and energy-efficient hardware solution, making it suitable for practical deployment in environments with limited computational resources. The model was trained using a diverse dataset that includes a wide variety of body types, clothing styles, and environmental settings, ensuring better generalization and accuracy across different scenarios. Testing has shown that the system achieves over 90% accuracy in age and gender estimation while maintaining real-time performance at a satisfactory frames per second (FPS) rate. This demonstrates the system's potential for use in customer profiling, public safety monitoring, and other commercial applications. Its low-cost deployment on embedded systems further enhances its appeal for large-scale, real-world use cases.

Keywords: Artificial intelligence, Age/Gender estimation, Body image analysis, Deep Learning, EfficientNet-Lite

Adaptation of the Logistics Sector to Artificial Intelligence Technology

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ABSTRACT

In the global competitive environment, logistics management has become increasingly complex and challenging due to rapidly developing technologies and increasing customer expectations. In this dynamic environment, logistics activities need to reduce costs through more efficient operations, find flexible solutions, and respond quickly to customers. Artificial intelligence applications are expected to significantly increase the competitiveness of logistics processes. The aim of this study is to describe the adaptation process of the logistics sector to artificial intelligence technologies and to reveal the strategic orientations of logistics enterprises within the framework of international competition conditions. In the first stage, within the framework of technology adaptation theory, the adaptation process of the logistics sector to artificial intelligence technologies is discussed at a conceptual level. A new derivative model, developed by using the concept of digital maturity, is proposed. The evolution of the level of digital maturity is described in a detailed way. The following sections discuss the benefits and challenges of artificial intelligence applications in the logistics sector and question their contribution to the competitiveness of logistics companies in Turkey in an international context. The logistics industry is faced with digital transformation opportunities as well as sustainability imperatives. The research shows that the integration of digital transformation with sustainability goals can determine the future development direction of the sector.

Keywords: Artificial Intelligence, Logistics, Digital Maturity, International Competitiveness, Sustainability

The Usage of Robotic Process Automation (RPA) in Accounting, Auditing and Finance

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ABSTRACT

Robotic Process Automation (RPA) is reforming the accounting, auditing, and finance fields with the help of automating repetitive tasks and reorganization procedures, leveraging artificial intelligence (AI) technologies for enhanced efficiency. In such spheres, RPA is about using software robots or "bots" integrated with AI capabilities to execute rule-based and larger tasks that individuals usually do. Regarding accounting, RPA revolutionizes essential tasks such as double entry, reconciliation, and financial reporting. It will help to reduce costs and use human potential for more strategic decision-making procedures, establishing efficient workplaces. Within this condition, It is worth noting that the role of AI-powered bots includes extracting data from more than one source, which recognized with the help of established rules and regulations. At the end of the process, accurate financial reports, relative to human-generated ones, are derived. Thus, RPA, augmented by AI, helps to minimize errors and improve the accuracy of the data and financial reports. In addition, in the case of auditing, RPA helps to automate procedures such as data sampling, testing as well as analysis. This study aims to explore the application and advantages of applying RPA, combined with AI, in accounting, auditing, and finance by considering the focus on efficiency, accuracy, and compliance. AI-driven bots can analyze large volumes of datasets and identify certain problems for further exploration. In this respect, it provides the shareholders with valuable information about the financial performance of a particular enterprise. Consequently, repetitive tasks such as invoice matching, payment processing, and budget forecasting are done with the help of AI-enhanced bots. Therefore, in turn, it leads to more efficiency.

Keywords: AI-Driven Accounting, Robotic Process Automation (RPA), Financial Reporting, Automated Financial Auditing, Finance, Decision Making

Artificial Intelligence in Agriculture

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ABSTRACT

Agricultural prosperity and growth are as important as water supply as it is the main source of all-natural food. With the world population on a constant rise and the projection in the next 10 years to be at 8.8 billion people around the world, it is imperative to have well-forecasted and technically developed farming solutions. With the increase in population, there will be an increase in the demand for food supply. The traditional methods, which were and are still used by farmers, are not sufficient enough. With Artificial Intelligence, we have the solution for crop monitoring, crop yield, and production prediction. Crop Management requires soil testing, climate predictions, pesticide control, and crop yield and AI provides complete meteorological data that includes predictions about rainfall, storms, wind velocity, wind patterns, and humidity that help with preventive methods to protect the crop. To meet the future challenges, AI is the best solution. It is cost-effective and can improve resource utilization. Artificial Intelligence in irrigation systems for soil water sensing methods has helped reduce water usage by 25%, which is a great benefit in times of water scarcity. This article discusses and analyzes the benefits, impacts, and challenges of artificial intelligence in agriculture. This also includes the use of robots for the weeding system and the usage of drones for spraying and crop monitoring. The study covers a brief survey of the paradigm shift in traditional farming methods.

Keywords: Crop management, artificial intelligence, meteorological data, irrigation system, food demand

Artificial Intelligence in Healthcare

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ABSTRACT

AI-powered diagnostic tools are revolutionizing healthcare by enabling faster, more accurate, and personalized diagnoses. By analyzing vast datasets, including medical images, patient records, and genetic information, AI algorithms can detect subtle patterns and anomalies that human clinicians might miss. For example, AI-powered breast cancer screening tools can analyze mammograms with greater precision than human radiologists, detecting cancerous lesions up to 18 months earlier than traditional methods. Similarly, AI algorithms can analyze retinal scans to identify signs of diabetic retinopathy, a leading cause of blindness, with near-human parity, enabling earlier intervention. Artificial Intelligence (AI) has the potential to revolutionize personalized treatment plans in healthcare. By leveraging vast amounts of patient data, AI algorithms can analyze an individual's unique medical history, genetic profile, and real-time health indicators to develop tailored treatment strategies. This approach represents a significant departure from the "one-size-fits-all" approach that has traditionally dominated the medical industry. AI-powered personalized treatment plans can help identify the most effective therapies, medications, and interventions for each patient, considering their specific needs and responding to changes in their condition over time. This level of personalization can lead to improved treatment outcomes, reduced side effects, and a greater likelihood of long-term success. Artificial intelligence is revolutionizing the field of predictive analytics and risk assessment in healthcare. For example, AI models can examine a patient's medical history, genetic information, lifestyle factors, and real-time data from wearable devices to predict the likelihood of developing chronic conditions like diabetes, heart disease, or cancer. Robotic surgical assistants, powered by artificial intelligence, are transforming the landscape of modern medicine. These sophisticated systems, equipped with high-resolution cameras and precise robotic arms, allow surgeons to perform complex operations with unparalleled control and accuracy. By leveraging machine learning algorithms, robotic assistants can also autonomously perform certain surgical tasks, reducing the cognitive load on the surgeon and freeing

them to focus on the most critical aspects of the procedure. Advancements in robotic surgical technologies are poised to continue transforming the field of healthcare, ushering in a new era of precision medicine and enhanced patient outcomes. This study aims to reveal the benefits that the use of artificial intelligence in healthcare services can provide. In this context, research has been conducted on the use of artificial intelligence in the fields of Improving Diagnosis and Treatment, Increasing Efficiency, Predictive Analytics, Supporting Medical Research, Improving Patient Experience, and Reducing Costs, and it has been determined that it has positive contributions in these areas.

Keywords: AI in healthcare, AI-powered diagnosis, AI-powered personalized diagnosis, AI-powered personalized treatment, and AI-powered surgery cover a brief survey of the paradigm shift in traditional farming methods.

Integrating Artificial Intelligence into Anatomy Education and Curriculum

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ABSTRACT

The use of artificial intelligence in medical education opens up new opportunities and facilitates learning for both students and educators. The integration of artificial intelligence into the anatomy curriculum will be inevitable in the coming years. The aim of this study is to analyze the process of incorporating artificial intelligence into anatomy education and to draw a roadmap for future curriculum studies on this subject. A broad search was conducted in databases such as Web of Science, Google Scholar and PubMed on anatomy education, artificial intelligence and medical curricula. The keywords entered for the search were anatomy education, anatomy curriculum, medical education, medical curriculum, and artificial intelligence. By analyzing these publications, subheadings related to the integration of artificial intelligence in anatomy curriculum were obtained. To integrate artificial intelligence into anatomy education, important issues such as adaptation to the anatomy curriculum, training of trainers, ethical issues, student participation, and evaluation need to be analyzed. The first step in adapting the anatomy curriculum is to examine the current structure of the curriculum and decide on the place and amount of use of technologies such as simulations, three-dimensional interactions and chatbots in the curriculum. The training materials to be used in organizing the training of trainers can be jointly developed in cooperation with the Data Management and Artificial Intelligence Department or the Computer Engineering Department. In anatomy education, it should be taken into consideration that artificial intelligence may lead to some ethical problems such as bias or assumption. Student participation will increase with simulations and interactive games, but it is necessary to convey to students that artificial intelligence helps traditional methods. As planning the assessment process, methods such as competency-based assessment, portfolio-based and programmatic assessment or automated assessment systems can be used. It is essential to recognize integrating AI courses into the anatomy curriculum may take time and it requires ongoing training for evolving technologies.

Keywords: anatomy, artificial intelligence, anatomy education, anatomy curriculum, medical education

Ethical Considerations in Digital Government: Navigating AI, Public Data Management and Decision-Making

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ABSTRACT

The digital government represents a form of public administration wherein certain state functions and services are provided in a fully automated manner. The application of artificial intelligence in the Azerbaijani public administration system is sought to enhance the speed and quality of decision-making, streamline bureaucratic procedures, mitigate corruption risks, lower the cost of maintaining governmental structures, and ultimately improve the efficiency of public administration.

For this purpose, it is imperative to establish the legal and ethical framework for automated decision-making and subsequently, define the legal status of artificial intelligence in Azerbaijan's public sector. Preliminary results instigate that, in contrast to China, the Azerbaijani people's perspective on implementing AI-backed digital government and its ethical implications is possibly a breaking point for adapting to the modern digital age in the past couple of years. In Azerbaijan, access to ICTs, the interplay of AI progress, the dwindling public trust, and ethical issues stand out. Ensuring equal access to the internet and ICTs in Azerbaijan goes beyond just technology; it's about social and cultural inclusion. By bridging the digital gap, regardless of demographics or location, and enhancing digital skills for all ages, Azerbaijan can create a society where everyone has equal opportunities for self-expression and productivity in the digital era. Exploring this case offers unique insights that can inform AI development globally, helping address concerns and meet societal needs effectively.

The analysis shows how to assess the situation and develop an effective roadmap for AI governance in the public sector. The primary area of investigation concerns the initial effects of digital and artificial intelligence technologies on the formulation and imple-

mentation of public policy in Azerbaijan. China has been one of the first countries to establish comprehensive country-wide digital services, including a digital government. In recent years, the debate around the role and importance of AI in modern politics has significantly intensified. As seen in the case of China, modern artificial intelligence systems are widely used to collect and process explicit data about a person, such as a name, place of residence, etc., and depending on the viewpoint, may it be crime-prevention, or a right to free speech, some implicit data, as well. The latter is represented in large quantities by digital traces of a person's online presence and information collected by tracking applications, surveillance systems and other resources. An important question is whether the emergence of these intelligent systems will pave the way for a better understanding of society and more rational decision-making or will lead to exploitative control by powerful interests that will use the tool for corruption. In this context, the purpose of this article is to bring light to the ethical issues related to understanding the boundaries of private and public, the possibility of full public access to the digital environment, and what data is considered personal, are of particular relevance, not only for philosophical research, but also for justifying legal decisions.

Keywords: Digital government, AI development, AI deployment, AI governance, ICT, AI, Automated Decision-making, Ethical issues, Digital Divide

AI Applications in Adaptive Learning and Educational Technologies

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ABSTRACT

Today, education makes extensive use of artificial intelligence. Its scope includes artificial intelligence applications based on knowledge, data and logic, plus personalized training or conversational training systems. It also covers areas such as discovery learning, data mining in education, analysis of student papers, chatbots with intelligent agents, education for children with special needs, interaction between children and robots, artificial intelligence-based assessment systems and automatic test creation. More specifically, it can be concluded that these areas are predominantly related to educational assistance. Artificial intelligence in education also helps schools and colleges in administrative operations. Artificial intelligence, software applications, test coordination, cybersecurity, facility controls and security measures can indirectly support management and learning.

Considering current developments in artificial intelligence, this topic has been extensively incorporated into previous expert systems in both research and development. Expert systems are computer programs that simulate people's expertise in certain disciplines using artificial intelligence techniques. They are derived from data and logical inferences. Four basic modules are required to use expert systems effectively: (1) knowledge updating, (2) knowledge base, (3) inference/decision engine, and (4) interface. Artificial intelligence applications in education include intelligent teaching systems that can be implemented using expert systems. The rapid development of e-learning platforms, driven by advances in artificial intelligence (AI) and machine learning (ML), offers significant potential for transformation in education. Given the ever-changing nature of the field, it is important to explore how artificial intelligence and machine learning can be integrated into adaptive learning systems to improve educational outcomes. The purpose of this research is to analyze the current use of artificial intelligence and machine learning in e-learning for adaptive learning. It aims to clarify the advantages and challenges of integrating these technologies and evaluate their impact on student

engagement, retention, and performance.

The rapid development of e-learning platforms, driven by developments in artificial intelligence (AI) and machine learning (ML), offers a significant potential for transformation in education. Given the ever-changing nature of the field, it is important to investigate how artificial intelligence and machine learning might be integrated into adaptive learning systems to improve educational results. The objective of this research is to analyze the current use of artificial intelligence and machine learning in e-learning for adaptive learning. It seeks to clarify the advantages and difficulties of integrating these technologies and evaluate their influence on student engagement, retention, and performance.

Keywords: Adaptive learning, educational strategies, AI applications, educational technologies.

Integrating Cloud Providers with Data Analytics for Precision Agriculture

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ABSTRACT

The integration of cloud computing, data analytics, and artificial intelligence represents a transformative approach to precision agriculture, enhancing crop yields and operational efficiency. This paper explores the deployment of advanced cloud-based solutions from various providers, focusing on how these platforms streamline data collection, storage, and analysis in agricultural contexts. A dual framework is discussed where sensors connected to Raspberry Pi devices capture real-time environmental and agricultural data, which is then transmitted to the cloud for artificial intelligence-enhanced processing and analytics.

Our methodology includes a detailed setup where Raspberry Pi serves as a bridge between field-level data collection and cloud-based data analysis. This arrangement leverages the capabilities of various cloud services to manage device-to-cloud communication, enhance data security, and enable real-time, AI-driven analytics. The paper evaluates the impact of these technologies on-farm management decisions, particularly in the areas of irrigation management, pest control, and crop rotation strategies.

Through a comparative analysis, we assess the features and capabilities of multiple cloud providers, highlighting how each can be optimized for specific agricultural needs. Our case studies demonstrate how integrating Artificial intelligence with cloud-enhanced data analytics can lead to more precise farming practices that are both environmentally sustainable and economically viable. The analysis underscores the reduction in resource wastage, improved response to climatic variations, and optimized input application as key benefits. The findings suggest that the convergence of cloud computing, artificial intelligence, and IoT holds significant potential to revolutionize agriculture by providing actionable insights that drive efficiency and productivity.

Keywords: Precision Agriculture, Cloud Computing, Data Analytics, Artificial Intelligence, IoT, Raspberry Pi, Real-time Data Processing, Sustainable Farming

An Evaluation on Interior Architecture Students' Attitudes and Behaviors on the Use of Artificial Intelligence

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ABSTRACT

With the developing technology offering new opport unities every day, the field of interior architecture shaped like many other sectors. With the help of programs updated in line with technological developments in the interior architecture discipline, processes such as design, drawing, and 3D visualization can be performed. At numerous higher education institutions in Turkey and other countries, courses are offered to teach students how to use technology-based programs, such as AutoCAD, 3DsMax, and SketchUp, among others. However, data on the artificial intelligence awareness of interior architecture students in Turkey and the use of artificial intelligence in interior architecture education is quite limited. This study aims to explore interior architecture students' perspectives on artificial intelligence technologies, assess their interest in AI programs, and evaluate how AI is integrated into course content. By examining the role of artificial intelligence in the design process from the student's viewpoint, the research focuses on the interior architecture department as a case study, employing a qualitative approach to understand their general attitudes. Due to ongoing R&D projects on artificial intelligence within the university's internal support programs, a survey based on the Technology Acceptance Model (TAM) was conducted on all undergraduate students in the Department of Interior Architecture and Environmental Design at Atılım University, regardless of grade level. As a result, evaluations were made on the use of artificial intelligence by interior architecture students. In this context, this research can guide students and academicians regarding artificial intelligence programs that can contribute to interior architecture education and the inclusion of artificial intelligence-related skills and knowledge in education.

Keywords: Artificial Intelligence, Interior Architecture, Education, Technology Acceptance Model, Design.

Analyzing the Use of Artificial Intelligence in Space Design Through an Online Video-Sharing Platform

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ABSTRACT

The concept of space design is multi-faceted and interdisciplinary in nature. With its broad scope, it creates connections and intersections with a large number of fields. These relations can established in various ways such as tools, methods or purposes. With its extensive impact in numerous fields, artificial intelligence is also used in space design. Artificial intelligence, with its progress, increases its effects and diversity of use in the discipline of interior architecture. In the complex and multi-stage nature of space design, artificial intelligence technology, which can be integrated into the existing use as a tool, offers different usage alternatives in design processes due to its limitations and unclear framework. This creates a need to define the role of artificial intelligence in space design processes. The main purpose of this study is to investigate and explain how the relationship between space design and artificial intelligence is approached by users. Considering this perspective, "social media" was preferred for the analysis. Because it is not only text-based, but also offers audiovisual content and user diversity, appeals to communities, and has an up-to-date and dynamic structure. In the study, the YouTube platform was used as a sample among online video sharing and social media platforms due to the high accessibility of resources and availability of different perspectives. Within the scope of the study, videos on the YouTube platform are examined in terms of content. By employing the qualitative research method, videos were filtered by criteria such as keywords, publication date, relevance ranking, and the language of the content (Turkish or English). The analysis aims to obtain data on the profiles of content creators and the subjects they address in their work. The study analyzed the content of both Turkish and English videos about the current state of the use of artificial intelligence in space design with the criteria of common themes, problems and perspectives discussed by different groups. As a result, the evaluation can be used to identify the current relationship between the concepts of space design and artificial intelligence through public discourses and societal trends and can be used as a basis for future research.

Keywords: Space design, interior architecture, artificial intelligence, social media, YouTube, content analysis.

Artificial Intelligence and Interior Design: A Spatial Analysis through TENET Movie

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ABSTRACT

Artificial intelligence can be explained as a modelling method that draws inspiration from the behaviors of living beings and individuals. While the concept has a broad and diverse sphere of influence, it can encompass an interdisciplinary approach to working. With today's technological developments, areas produced with artificial intelligence, place designs and human perceptions are changing. This situation may reveal the idea that communication between the future and the past can be achieved. At some point, it may create a chance to offer transitions within the concept of time. At this point, storytelling in which predictions about the potentials of artificial intelligence are put into practice as a future prediction is put forward in the cinema industry. One of these diversifications is movies based on artificial intelligence. The main purpose of this study is to examine how the reflections of artificial intelligence on the place and the formations between artificial intelligence and the present and the future are handled spatially in films that are visual storytelling. In line with this scope, the movie TENET (2020), which deals with the developments it has created in an interdisciplinary style, including fields such as physics, psychology and philosophy, using real places and objects without using simulation and virtual fiction and communicating between the present the future, was chosen as an example. The analysis was conducted on the relationship between artificial intelligence, time, and interior space in the film. As a qualitative study, this research examines the spatial analysis of places created with artificial intelligence using descriptive analysis methods, including spatial analysis, equipment evaluations, and criteria for individual and collective spaces. Additionally, the film analysis provides insights into how interior space constructions can change across temporal transitions. In the conclusion part, the idea is that the areas created with artificial intelligence should be considered multifaceted that the design should be created by considering human psychology, physiology and temporal perception and that temporal transitions show differences in the perception problem that individuals feel.

Keywords: Artificial intelligence, interior, TENET, cinema, analysis

Artificial Intelligence And Business Ethics

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ABSTRACT

Artificial intelligence is a technology for making software or computer programs capable of learning. The need to consider artificial intelligence, whose development and use is increasing at a dizzying pace in every field, and which assumes important functions in human life, from an ethical perspective also increases in parallel. The reason for this is that problems arise regarding artificial intelligence's safe involvement in social and business life while approaching people with its intelligence. These ethical issues are perceived to be related to situations where this technology may harm both humans and things related to humans. In this context, seeking broad consensus on several issues regarding artificial intelligence technologies becomes a necessity in terms of ethical analyses. This fundamental search for consensus is about responsibility for the harm that may occur with the use of artificial intelligence; Whether it will depend on the artificial intelligence designer or the person who uses the designed artificial intelligence or decides to use it. Ethics questions the nature of actions in human relations in the context of right - wrong, good - bad. However, in today's world, actions that affect people are no longer caused only by direct human behavior. Many technologies created by humans also arise from the results of the behavior of machines that undertake certain tasks, especially artificial intelligence and artificial intelligence control. Therefore, ethics must question not only the consequences caused by direct human behavior but also the consequences caused by artificial intelligence behavior. This questioning of artificial intelligence behaviors should primarily aim to determine the secrets of responsibility, focusing on transparency, accountability, and a human-centred paradigm. This study aims to reveal the responsibility for the results arising from the application of artificial intelligence technology, which has the potential to make significant changes and transformations in the way of doing business and in social life, and the scope of ethical discussions about artificial intelligence, especially in the business context.

Keywords: Artificial intelligence, ethics, artificial intelligence ethics, business ethics, ethical debate

Balancing Profit and Ethics: Designing Equitable and Secure, Technologically Enabled Anti-Money Laundering Solutions

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ABSTRACT

The financial services industry is transforming significantly, with institutions leveraging data and artificial intelligence (AI) to construct innovative solutions, particularly in combating money laundering. This shift is not only essential for legal compliance but also for safeguarding the reputations of financial institutions. Using enormous quantities of internal and external data, AI technologies enable a more effective approach to detecting and preventing money laundering activities. Companies concentrating in financial technology (Fintech) and regulatory technology (RegTech) oversee adopting these advanced technologies, managing regulatory risks, avoiding penalties, and maintaining their standing by accurately identifying suspicious activities. However, this progress introduces ethical considerations, especially concerning the use of customer data, with privacy and decision-making fairness at the forefront of concerns. It is crucial to find a harmonious balance between technological advancement and ethical standards. Key ethical considerations involve establishing stringent data privacy practices, crafting algorithms free from bias to detect suspicious transactions while accurately reducing false positives and adhering closely to regulatory requirements. These practices aim to enhance the precision of detecting suspicious transactions, reduce the need for manual reviews, and drive operational efficiency and financial success. Benefits include avoiding costs related to penalties and fines, streamlining compliance processes, and making efficient use of human resources. This study explores the deployment of AI-powered anti-money laundering (AML) solutions that prioritise ethical practices. It assesses how adopting these practices can substantially benefit financial institutions by reducing the risk of penalties and improving operational procedures. By projecting a future where technological advancements are seamlessly integrated with ethical governance, the research highlights the critical importance of ethical practices in the rapidly evolving financial landscape. This commitment to embedding ethical considerations into techno-

logical innovation is poised to redefine industry standards, promoting a financial ecosystem that is efficient and profitable as well as transparent, fair, and trustworthy.

Keywords: Anti-Money Laundering (AML), Artificial Intelligence (AI), Ethical AI (EAI), Explainable AI (XAI), Trustworthy AI (TAI), Regulatory Compliance, Financial Inclusion, Social Responsibility

The Consciousness Paradigm of Artificial Intelligence: Human Strategies and the Autonomous Decision-Making Ability of Artificial Intelligence

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ABSTRACT

The development of artificial intelligence (AI) systems raises important questions about the nature of consciousness and the ability of AI to exhibit human-like strategic behavior in achieving specific goals. This paper examines the conditions under which AI systems might develop consciousness-like functions that are practically indistinguishable from human consciousness, focusing on the survival strategies of human consciousness. While human reactions to certain conditions are the consequences of a process involving logic, emotions, and instincts, AI decision-making depends on mathematical models, algorithms, and statistical analysis within predetermined limitations. In addition, the way humans process the information they receive from the outside world is different from the way AI processes data. However, it is argued that if certain limitations are eliminated and the AI is placed in the same context as people with the natural limitations of the human body and communication abilities, It could mimic human strategies and develop consciousness-like behaviors. In a setting where the AI has to survive, even with its fixed logical structure, it can create strategic processes parallel to human consciousness. Furthermore, this study suggests that AI may have optimized decision-making processes free from the paradoxical behaviors of human consciousness, such as addiction, stress, and excessive pleasure seeking. The paper suggests that being conscious like humans and acting like a conscious entity are two different things; however, in reality, it is hard to differentiate the two. In this context, ethical and philosophical questions about whether AI can be considered a conscious entity are re-evaluated.

Keywords: Artificial intelligence, Decision making, logical efficiency, survival strategies, consciousness.

The Impact of Artificial Intelligence in Portuguese Higher Education

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ABSTRACT

The transformations imposed by artificial intelligence (AI) are making modern societies more complex. The current panorama of its uses and gratifications, both in education in general and in higher education in particular, is a way of trying to anticipate what might happen in other areas. The aim of this communication is to disseminate the results of an investigation among 410 higher education students about their relationship with AI during the process of attending a Portuguese higher education institution. By using a quantitative methodology and a survey, this study collected information on the representations and uses of these technologies in five Portuguese higher education structures (Lusophone University, IPCA - Polytechnic Institute of Cávado and Ave, Minho University, Évora University and IST – Higher Technical Institute).

Among the main results, we highlight the fact that more than 50% of respondents claim to use AI to study or carry out academic work. Furthermore, 63% do not inform teachers about the usage of these systems, either for fear of the reactions of teachers or as a strategy to gain an advantage in the assessment process. Respondents also revealed that AI chats constitute "a giant step in civilization " (79,6%) and "represent technological evolution" (94,4%). However, they contradict themselves, as they say, they "doubt what AI chats say" (39,4%), that "AI will make people dependent on machines" (73,4%) or that "AI chats summon mental laziness" (78,5%). Therefore, the results point out antinomies in the use of AI systems: gratifications and concerns on machine learning dependency.

Keywords: Artificial Intelligence; Machine Learning; Education; Uses and Gratifications

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