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ON INTELLIGENCE-BASED TRANSFORMATIONS OF TECHNOLOGY AND BUSINESS TRENDS

WAY OF NEW LIFE:
Bridging Horizons in Artificial Intelligence, Robotics, Cybersecurity, Smart Cities, and Digital Economy.

30 - 31 MAY, 2024

BOOK OF ABSTRACTS

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30 - 31 May 2024

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Welcome Remarks

Dear Colleagues, Researchers, and Participants,

Welcome to the IV. International Conference on Innovation in Technology and Business Transformation (ICITTBT)! It is with great pleasure that we present to you this Book of Abstracts, a compilation of innovative research, groundbreaking studies, and insightful analyses that reflect the dedication and hard work of our distinguished contributors.

This year's conference brings together a diverse group of experts and emerging scholars from across the globe, each contributing unique perspectives and invaluable knowledge to their respective fields. The abstracts included in this book represent the forefront of research and development, showcasing the latest advancements and future directions in Artificial Intelligence, Robotics, Cybersecurity, Smart Cities, and Digital Economy,"

We are honored to host such a distinguished assembly of minds and to provide a platform for the exchange of ideas, fostering collaboration and inspiring new lines of inquiry. The breadth and depth of topics covered in these abstracts highlight the dynamic and interdisciplinary nature of our field, and we are confident that the discussions and presentations at this conference will lead to significant advancements and fruitful collaborations.

We extend our deepest gratitude to 161 authors from all around the world (Albania, Turkiye, South Korea, Italy, Azerbaijan, Czech Republic, Bosnia and Herzegovina, Lithuania, Kuwait, Kosovo, Canada, Serbia, Indonesia, North Macedonia, Syria, United Kingdom, East Africa, Tanzania, Spain, Germany, Malaysia, Croatia, Switzerland, Brazil, Poland, Tunisia, Latvia and Estonia) who have submitted their work, the reviewers who have diligently evaluated the abstracts, and the organizing committee whose tireless efforts have made this event possible. Your contributions are the cornerstone of this conference, and we are proud to showcase your work.

As you explore this Book of Abstracts, we hope you find inspiration, gain new insights, and engage in meaningful dialogues that will drive innovation and progress. We encourage you to take full advantage of the opportunities to network, collaborate, and share your ideas with fellow attendees.

Thank you for your participation and for being a part of this vibrant academic community.
We look forward to the exciting exchanges and discoveries that this conference will undoubtedly bring.

Warm regards,
Prof. Dr. Ismail KOCAYUSUFOGLU
Rector

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A Smart Data-Driven Diagnosis Framework for Lower Back Pain Anomaly Detection

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ABSTRACT

Spinal disorders are becoming increasingly common in the teenage years, and many adolescents, even children, suffer from pain and distress caused by spinal problems. Several variables, including poor sitting posture, prolonged posture fatigue, and regular use of electronic devices, have caused an increase in the occurrence of spine problems in teenagers. Therefore, to prevent it from getting worse in older ages, it is essential to determine whether lower back pain is abnormal at an early stage. Recent advances in artificial intelligence technologies in the field of spine surgery are promising in assisting specialists in early diagnosis. In this study, a publicly accessible dataset is analyzed to diagnose spinal disease using machine learning algorithms. After removing outlier values and scaling data, correlation analysis is performed to evaluate the effect of independent variables on the dependent variable. Different classification algorithms are tested to build the most efficient model. The decision tree-based ensemble learning model validated with the highest f-score value seems to be an appropriate selection compared to the literature for smart healthcare systems to diagnose lower back pain.

Keywords: *Lower Back Pain, Machine Learning, Classification, AI in Healthcare*

Sustainability of Societies in an Era of Rapidly Changing Technology

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ABSTRACT

Every country has a national development plan that has certain elements that need to focus on to reach certain national goals for the next 5, 10 or 30 years. Some of these elements include the global positioning of the country, human capital, health care, living environment, economy, infrastructure, etc. The rapid change in technology plays a major role in shaping the national development plans and therefore forcing societies to change their ways of living, which include changes in their dwellings (i.e. smart cities), education (i.e. online learning, use of AR and VR), jobs (i.e. remote access, AI applications as in ChatGPT, robotics, etc.), food (i.e. smart farming), health (i.e. AI in diagnosing and monitoring), infrastructure (i.e. 5G and/ or 6G, alternative energy sources), and economy (i.e. digital economy, cybersecurity). This framework is based on the authors' experience in their countries, and it shows the basic requirements needed to be adapted by societies to make them responsive to those rapid changes. These requirements will mandate changes in the current systems such as education, health, and economic systems, which will be discussed in this paper. The framework proposed in this paper will require synchronised coordination between several entities in the country, governmental and private, to achieve the defined overall objectives of the national plan. Keeping in mind that the framework presented may not be applicable in every country due to limitations in the local infrastructure such as the lack of enough telecommunication coverage in all areas, economic limitations, etc., nonetheless, the framework can be used as a guide toward the design of an attainable national plan with the need to make it sustainable.

Keywords: *Artificial Intelligence, 6G, AR, Smart Cities, Education, Sustainability*

Hate Speech Detection in Albanian YouTube Comments: A Comparation Analysis of Flan-T5 and GPT 3.5

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ABSTRACT

Hate speech on social media appears to be inevitable in our era of ever-more connectivity. This presents a distinct challenge because it is hard to design automated techniques to identify such speech, especially for low-resource languages. We present PAR database, derived from YouTube comments associated with politics, actuality, and reality show content. Our study compares the performance of two models: Google's Flan-T5 and GPT 3.5. We evaluate their ability to detect hate speech across three topics and analyses their performance on each individual topic. We also evaluate the effect of translating a comment from Albanian Jargon to standard Albanian on the model's performance. This analysis is important because both models utilize the translated English version as the target language for distinguishing such comments. Lastly, we debate whether large language models like GPT 3.5 are required for this kind of task. Is using a model this scale for transfer learning really that beneficial, even if the model has no knowledge of the Albanian language? Or should we focus more of our attention on engineering and text annotation.

Keywords: *Hate Speech, Social Media, Low-Resource Language, Fine-Tuning Llms, Comparative Analysis*

Intelligent Digital Framework for Art Investment Amid Geopolitical Conflict: A Sustainable Economic Approach

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ABSTRACT

The art market presents a unique challenge when interfaced with geopolitical conflict zones in the complex interplay of global economics and management. Art investors grapple with the high volatility and unpredictability of art valuation from these regions, an issue exacerbated in the rapidly evolving digital landscape. This study articulates a predictive model grounded in sustainable intelligence principles aimed at equipping investors with a strategic toolset for navigating the uncertain terrain of art investment in areas of geopolitical unrest. The research employs a robust meta-analytical approach complemented by research methodologies, including the Q-sort and HCP methods. This dual-faceted approach critically examines the existing literature on art investment, filtering through the digital economy's lens to identify sustainable and intelligent investment pathways. The model is particularly pertinent to the digital era, where data-driven insights and technology-mediated communications have become pivotal in shaping economic decisions.

Focusing on art from regions embroiled in geopolitical disputes - specifically, Russia-Ukraine, Azerbaijan-Armenia, and Israel-Palestine - the study proposes an investment model that employs digital tools for predictive analysis and risk assessment. The resulting model is a testament to the transformative power of digital technologies, suggesting that intelligent systems can foster economic sustainability and resilience in management practices, particularly in the volatile art market.

This proposed model underscores the relevance of digitalization in contemporary economic and management strategies, illustrating its potential to enhance ethical investment decisions and support the growth of a sustainable digital economy. As the global community continues to face geopolitical challenges, the model serves as a beacon for economic decision-making, demonstrating the integral role of sustainable intelligence in the digital age.

Keywords: *Sustainable Intelligence, Digital Economy, Art Investment, Geopolitical Risk, Predictive Modelling, Decision-Making Framework.*

Leveraging Green Financing for Sustainable Energy Development in Albania: Opportunities, Challenges, and Pathways

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ABSTRACT

Green financing has emerged as a crucial element in advancing sustainable energy endeavors, particularly in the realms of renewable energy and energy efficiency, as part of the broader pursuit of Sustainable Development Goals (SDGs). In Albania, the prospects of green financing present both significant opportunities and substantial challenges as the nation transitions towards a sustainable energy landscape. This research investigates methods to optimize green financing mechanisms, to support Albania's energy sector, with a focus on renewable energy ventures and initiatives aimed towards enhancing energy efficiency. Through a comprehensive mixed-methods research approach, this paper aims to identify within the existing scenario, obstacles, and catalysts pertaining to green financing within Albania's distinctive context. It looks into the roles played by various financial entities, such as development banks, private investors, and governmental initiatives and programs, in facilitating investments geared towards achieving energy sustainability. Furthermore, the research undertakes a critical analysis of the regulatory and market impediments hindering the scaling of green finance inflows towards renewable energy projects and energy efficiency enhancements, while also suggesting strategic interventions to overcome these challenges. Crucial areas of exploration include the alignment of green financing initiatives with SDG objectives, the influence of financial and policy instruments on the deployment of renewable energy resources, and the effectiveness of current green financing frameworks in bolstering energy efficiency endeavors. The ultimate objective of this study is to provide actionable insights intended for policymakers, financial institutions, and stakeholders dedicated to propelling Albania's energy sustainability agenda through the augmentation of green financing practices.

Keywords: *Green Financing, Renewable Energy, Energy Efficiency, Sustainable Development Goals (SDGs), Albania, Sustainable Energy Development, Financial Mechanisms, Policy Interventions.*

Changes in Motivation among Transport and Logistics Workers in the Context of Digital Transformation

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ABSTRACT

The field of transport and logistics is constantly developing and also reacts flexibly to the current situation of the globalized market, digital transformation and the development of autonomous systems. The globalization of trade also brings an ever-increasing demand for quality transport and logistics services, which is why the lack of human resources in this area has a more global character. The aim of the contribution is to identify changes in the perception of motivational factors among Czech workers in the field of transport and logistics with an emphasis on their preference in the field of further education and company vision. The results of the development of motivational preferences of workers working in transport and logistics are based on data obtained through a questionnaire survey during the years 2017 to 2021 (the last survey period is from June 2020 to June 2021 due to capturing changes due to the coronavirus pandemic). Descriptive and inferential statistics (Anova test and Tukey HSD test) were used for data processing. The conclusions show significant differences among workers according to work category. The results of the research are not only a basis for further investigation of the issue, but also for business practice, which needs to apply a sophisticated approach and targeting when creating motivational programs. The results show that employers should perceive the difference in motivational preferences of individual job categories.

Keywords: *Motivation Factors, Employees, Trends, Digital Transformation, Transport and Logistics*

Go European: A transformative journey across dreams, models, expectations, and realities.

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ABSTRACT

This paper examines from four distinct perspectives market price differences of identical products traded by the same international companies in Albania and the EU markets. It reveals that: (i) the economic models would predict that prices of identical products, offered by the same operators in an open and integrating market, should converge toward equalization with the larger market; (ii) the expectations of businesses and consumers in Albania would suggest slight price differences (highest average less than +6 percent, based on two surveys conducted with 150 consumers and 30 businesses in Albania); (iii) the reality, based on price information collected in the Albanian and European markets for 150 consumer products, sold in Albania by three major European companies, unveils that during Spring 2024, the average price of the products in the Albanian market is 79.7 percent higher than the average price of the same identical products, sold by the same operators in the EU markets. The paper analyzes the factors enabling and contributing to such significant price differences between the Albanian and the EU markets, the burden and implications for the Albanian society, the costs for consumers and the economy, and provides consumer- centered, market-based recommendations.

Keywords: *Competition; Competitiveness; Price differentials; Purchasing power parity; Dominant position; Monopolies; Oligopolies; Internal market; Excessive prices; EU integration; Albania*

The Prospective Outlook of Banking: Fintech Advancements Influencing the Configuration of Digital Banking Offerings

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ABSTRACT

This research endeavor embarks on a comprehensive exploration aimed at scrutinizing the profound impact exerted by Fintech innovations on the architectural configuration of digital banking services, thereby presenting anticipatory perspectives on the future trajectory of the banking industry. Through a rigorous and meticulous systematic review, this study undertakes an exhaustive examination encompassing scholarly literature, industry reports, and pertinent case studies. The overarching objective of this approach is to furnish a thorough comprehension of the prevailing trends, developments, and emerging dynamics at the convergence of Fintech and digital banking realms. The findings derived from this comprehensive analysis unveil a discernible paradigm shift within the banking milieu, propelled by the seamless integration of cutting-edge technologies such as blockchain, artificial intelligence, and big data analytics into digital banking frameworks. These technological innovations have catalyzed enhanced accessibility, operational efficiency, and customization of banking services, aligning seamlessly with the evolving proclivities and expectations of contemporary consumers. Moreover, the study sheds light on the burgeoning emergence of novel business paradigms and strategic collaborations between traditional banking institutions and burgeoning Fintech enterprises, thereby capitalizing on opportunities for pioneering advancements and expansive market reach. Drawing upon these discernments, it is inferred that Fintech disruptions are fundamentally reshaping the architectural landscape of digital banking services, thus heralding a future characterized by enriched consumer experiences and heightened organizational adaptability. Concurrently, the study offers actionable recommendations for incumbent banks and financial institutions to embrace technological metamorphosis, foster an environment conducive to digital transformation, and prioritize cybersecurity protocols to mitigate potential vulnerabilities effectively. Additionally, the study embarks on an extensive discourse on prospective research trajectories, thereby providing a comprehensive framework for delving into the enduring ramifications of Fintech disruptions across regulatory paradigms, competitive dynamics, and initiatives aimed at fostering financial inclusivity.

Keywords: *Artificial Intelligence, Digital Banking, Fintech, Future Trends, Innovation, Technological Disruption*

Navigating the Legal Landscape: International Jurisprudence on Cyber Violation of Human Rights

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ABSTRACT

In the digital era, the intersection of technology and human rights has become increasingly intricate, demanding a robust legal framework to safeguard individuals from cyber violations. This presentation delves into the evolving field of international case law of the European Court of Human Rights concerning cyber infringements on human rights. Through an interdisciplinary lens, it explores key legal principles, landmark cases, and emerging trends shaping this dynamic legal landscape. Drawing upon international case law, the presentation analyzes the foundational principles underpinning the protection of human rights in cyberspace. It examines the challenges posed by rapid technological advancements, such as digital surveillance, online censorship, and privacy breaches, and evaluates how existing legal frameworks adapt to address these issues. Ultimately, this presentation aims to deepen understanding of the complex interplay between technology, law, and human rights in the digital age. By elucidating international jurisprudence on cyber violations of human rights, it seeks to foster informed dialogue and proactive measures to uphold fundamental freedoms in an increasingly interconnected world.

Keywords: *Legal Landscape, International Jurisprudence, Cyber Violation, Human Rights*

Real-Time Total Harmonic Distortion Generated from PV Power Plant Measurement and Filter Design Using LabVIEW Software

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ABSTRACT

Nowadays, in Albania, several photovoltaic plants are in various stages of construction. The main problem encountered is the power quality, because in spite of the energy production, PV Power Plants inject into the electrical grid voltage harmonics form the conversation of DC to AC through Power Electronic devices like inverters. Except for the fundamental harmonic, the voltage and current spectrum of the inverter output contain high-order harmonics. In this work, we will present a virtual instrument built in the LabVIEW software, which is customized to measure THD and to notify in real-time for the voltage signal harmonics present in the electrical grid PoC (Point of Connection) besides the fundamental 50 Hz harmonic, generated from a small-scale PV Plant in its AC side and to allow the remote user to implement the most suitable passive filter needed to be connected to reduce the THD to the allowed value by respective standard. This virtual instrument can be upgraded easily to automatically calculate and to select a passive filter and to connect it to the electrical grid to filter a specific harmonic of the voltage and current which is detected by the same instrument. This solution can be used to reduce the voltage and current THDs generated from PV Plants and other electrical devices.

Keywords: *THD, PV Solar Inverters, LabVIEW, Filter*

Integrating Machine Learning and AI into IoT-Enabled Smart Parking

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ABSTRACT

This study delves into the integration of machine learning (ML) and artificial intelligence (AI) techniques within Internet of Things (IoT)-enabled smart parking systems to optimize urban parking management. The purpose of this research is to enhance operational efficiency, alleviate congestion, and elevate user experience in urban environments. Methodologically, we conducted an extensive review and analysis of various data sources, ML algorithms, and AI technologies employed in smart parking infrastructures. Our investigation reveals that the convergence of IoT, ML, and AI enables intelligent data collection, analysis, and decision-making processes. By leveraging real-time and historical parking data, ML algorithms predict parking availability, optimize space utilization, and dynamically adjust pricing strategies. AI-powered systems enhance user experience through personalized recommendations, seamless navigation, and proactive maintenance. Furthermore, IoT sensors and connectivity enable remote monitoring, predictive maintenance, and efficient resource allocation, contributing to sustainable urban development. Results from case studies and simulations demonstrate significant improvements in parking efficiency, reduction in traffic congestion, and enhancement of overall urban mobility. Moreover, the integration of ML and AI fosters adaptive learning systems capable of continuously optimizing parking operations based on evolving user preferences and environmental conditions. This research underscores the pivotal role of technology-driven innovations in addressing the challenges of urbanization and fostering sustainable urban development. As smart parking systems continue to evolve and integrate advanced technologies, they offer promising solutions to enhance not only parking management but also overall urban mobility, paving the way for smarter, more efficient cities of the future. Recommendations include further exploration of advanced machine learning models and the development of standardized protocols for interoperability among IoT devices. Additional data on user acceptance and system scalability are essential for comprehensive evaluation.

Keywords: *TSmart Parking Systems, Machine Learning, Artificial Intelligence, IoT Integration, Data Analysis, Predictive Analytics*

Development of Bank Marketing in The Conditions of Digital Transformation in Azerbaijan

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ABSTRACT

Currently, the efficiency of banks' activities and their competitiveness in the financial market depend more on the application of the latest banking services and technological processes. The presented research examines the essence of digital banking, the digital banking model in Azerbaijan, and the trends of digitalization of the banking sector. The main purpose of the study. It is to determine the main perspectives of the development of digital banking and marketing activities in the context of the digital economy in Azerbaijan. As a result of the research, the problems and prospects in the marketing activity related to the application of digital technologies in the banking sector were determined. The methodological basis of the research was a dialectical approach to the analysis of the main events and regularities that contributed to the development of economic relations, as well as a systematic approach to revealing the main factors of the development of the banking sector of the Republic. In addition, statistical methods, comparative, fundamental and functional analysis methods, expert evaluations and scientific analysis methods of socio-economic events and processes such as modeling were used. In the article, the scientific works of foreign and Azerbaijani economists dedicated to the problems of the institutional development of the banking system of Azerbaijan are reflected in a number of provisions. Research results reveal the regularities and current trends of the development of the banking sector in connection with the digital economy. The current situation of the banking sector in Azerbaijan was analyzed and the prospects of applying financial technologies to bank marketing were determined.

Keywords: *Digitization, Digital Technologies, Advertising, Competition, Consumer*

Unveiling Anomalies: Leveraging Machine Learning for Internal User Behavior Analysis – Top 10 Use Cases

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ABSTRACT

In contemporary cybersecurity landscapes, detecting anomalies within internal user behavior is critical for safeguarding organizational data against potential threats. This paper focuses on integrating a machine learning module into a Security Information and Event Management (SIEM) system, specifically tailored to detect the top 10 use cases of anomalous behavior. The selected machine learning module leverages the following techniques: 1. Advanced Clustering Algorithms: These algorithms group similar user behavior patterns, aiding in the identification of deviations from the norm. 2. Dimensionality Reduction Techniques: By reducing the dimensionality of user activity data, we can enhance efficiency and mitigate noise. 3. Novelty Detection Approaches: These methods highlight novel patterns that may indicate anomalies. The research prioritizes the identification of the most prevalent and impactful use cases, including: • Insider Threats: Detecting suspicious behavior from authorized users. • Data Exfiltration: Identifying unauthorized data transfers. • Credential Misuse: Flagging abnormal credential usage. This paper explores how machine learning can help analyze user behavior within an organization. Furthermore, this paper provides practical insights for integrating the machine learning-based anomaly detection system into existing cybersecurity frameworks, particularly within the context of SIEM solutions. By delineating the implementation and setup process of the machine learning module, this research equips cybersecurity practitioners with actionable setup to bolster threat detection capabilities and fortify organizational defenses against internal users malicious activities.

Keywords: *Anomaly detection, Data exfiltration, UBA, SIEM, Machine learning, Insider threats*

Econometric Analysis of Digital Marketplaces

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ABSTRACT

The digital economy's rapid evolution resulted in the era of digital marketplaces, which are global platforms that enable transactions between consumers and sellers.These are online marketplaces that enable global transactions between buyers and sellers. In order to understand the intricate dynamics present in digital marketplaces, this research conducts an economic analysis of them using models and statistical methods. The study intends to shed light on the economic implications, efficiency, and roles of network effects and trust mechanisms in these digital platforms. It does this by utilizing a comprehensive dataset that includes transaction data, user behaviors, and marketplace features from key platforms. Regression analysis, machine learning, and network analysis are all included in the methodology, which aims to identify the causal links and predictive dynamics that shape digital marketplaces. The important roles that trust and network effects play are highlighted by preliminary data, along with the complex consequences that platform policies have on consumer welfare and competition. Despite the advantages there are drawbacks as well, including vendor lock-in, security issues, and dependence on internet connectivity. This work expands our knowledge of digital marketplaces by offering insights to platform designers, legislators, and other stakeholders in the digital economy. Future research projects and new data considerations are suggested in order to conduct a more thorough analysis of this crucial component of the digital commerce ecosystem.

Keywords: *Digital Marketplaces, Econometric Analysis, Network Effects, Trust Mechanisms, Economic Impact*

Upgrade of the Automatic Radiation Monitoring Station in Korça Region

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ABSTRACT

The main task of an automatic radiation monitoring station is to monitor the environmental radioactivity in real time. At present, much emphasis is placed on the human health risk associated with radioactivity in the environment. In case of the abnormal increase levels of the environmental radioactivity, the station provides an automatic early warning of the radiological emergency situation to the operation centre. The first automatic radiation monitoring station in Korça Region was established in 2004 and in 2020 it has been upgraded with completely new equipment. This station, installed at the Korça University, is part of the National Network for Radiation Monitoring with the operation centre at the Institute of Applied Nuclear Physics in Tirana. The aim of the present study is to give the major development stages of the Korça radiation monitoring station arrangements, especially the setting up of the new station. In addition, the baseline data for ambient gamma dose rates measured by the new Korça station is calculated and the environmental radioactivity is analysed during a two-year period after station installation. Finally, the annual dose of ambient radiation received by public members is conservatively estimated. This study demonstrates that Korça Region station upgraded with new automatic radiation monitoring equipment, is giving an essential contribution at national radiation protection measures. In the meantime, Korça station can especially contribute internationally with valuable data in the case of a national or regional radiological accident with transboundary implications. Based on the measures of both old and new stations, this study ensure that Korça Region is characterized by a normal environmental radioactivity and the annual ambient gamma dose received by the public is within national and international radiation limit levels.

Keywords: *Automatic monitoring, Radiation protection, Radiological emergencies, Public health*

The Situation of Digitalization in Enterprises: Analyzing Current Trends and Practices

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ABSTRACT

This paper explores the state of digitalization in enterprises by analyzing prevalent trends and practices. Employing qualitative analysis methodology and drawing upon secondary sources, the study examines the general characteristics of enterprises and key performance indicators (KPIs) such as workforce management, financial performance, market positioning, and innovation readiness. Additionally, it investigates the transformative impact of digital technologies on market structures, emphasizing the shift towards digitally-powered business models and the emergence of new entrepreneurial ecosystems. The evaluation of digitalization within enterprise systems reveals implications for operational processes and employment mechanisms, highlighting the imperative for organizations to embrace digital transformation. Furthermore, the study delves into the conditions conducive to technology development and implementation, emphasizing the pivotal role of factors such as financial resources, supportive government policies, technological infrastructure, and institutional reforms. The findings underscore the multifaceted nature of digitalization within enterprises, offering implications for strategic decision-making, policy formulation, and future research endeavors. Recommendations include fostering innovation ecosystems conducive to technological advancement and industrial growth. Overall, the research provides valuable insights into the complex dynamics of digitalization in enterprises and its broader implications for economic development and organizational competitiveness.

Keywords: *Digitalization, Enterprises, Innovation, Technologies, Development, Practices*

Assessing Entrepreneurial Competences among University Students: The Albanian Case

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ABSTRACT

The European Entrepreneurship Competence Framework (EECF) focusing on four dimensions: "Ideas and Opportunities", "Personal Resources", "Specific Knowledge", and "Into Action" remains an essential reference and indispensable tool to foster an entrepreneurial mindset in order to better manage the rapidly changing societies, dynamic careers, and create financial, cultural and social values for all. It further aims to establish a link between youthwork, education, employment, and enterprise. The purpose of this paper is to assess the Entrepreneurial Competences of university students in Albania by making use of a specially designed and adapted questionnaire (Bacigalupo et al, 2016 & Armuña et al, 2020), which has derived from the above-mentioned framework. As such, the Entrepreneurship Competence questionnaire has been addressed to a selected number of students from both public and private universities and bivariate and statistical analyses have been applied to the interpretation of results and suggestions recommended by the study.

Keywords: *The European Entrepreneurship Competence Framework (EECF), the Entrepreneurship Competence questionnaire, assessment of Entrepreneurial Competences, entrepreneurial education in Albania*

Corporate Credit Risk Prediction using Graph Based Deep Learning

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ABSTRACT

Corporate credit risk prediction is essential for evaluating the creditworthiness and the financial stability of companies. For this, the financial industry relies mainly on predictive models based on structured, tabular data. In this paper, we take an alternative approach that utilizes the relational data embedded within corporate networks. More specifically, we construct a graph representation of inter-company relationships, with nodes representing companies and edges denoting connections between them based on shared stakeholders or senior managers. Graph Neural Networks (GNNs) are employed to propagate information through the graph, capturing dependencies and interactions among the companies. Through empirical evaluation on a real-world dataset, consisting of companies based in the United Kingdom, our proposed GNN-based approach demonstrates better performance compared to traditional approaches such as Logistic Regression, Support Vector Machines and relational classifiers. The insights gained from this study can be used to complement traditional credit risk modeling approaches or extend various financial modeling tasks that can be enhanced using corporate networks.

Keywords: *Credit risk prediction, Graph Neural Networks, Deep Learning, Corporate Network, Finance*

Challenging the Cybersecurity Threats Through Education Programs

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ABSTRACT

This paper aims to investigate the knowledge and awareness of cybersecurity among ICT and social science students in Tirana, Albania. The rise of technology has brought about new security challenges that affect various institutions, including educational institutions at different levels. As cyber threats become more evident to society, it is essential to equip students with the necessary knowledge and skills to protect themselves and their assets online. The research involves comparing the two groups of students regarding their understanding of the significance of cybersecurity in today's world. The literature review and data collected will support the qualitative and quantitative findings, which will testify to the idea presented in this study. This research's data collection is based on a survey conducted among a sample of students from both disciplines, with a focus on the Tirana and Durres districts. The work-in-process results indicate that ICT students better understand cybersecurity and its implications than social science students. The study also reveals a need for increased awareness and education about cybersecurity among both social and ICT Students. The paper concludes by highlighting the importance of cybersecurity education for all students, regardless of their discipline and level of education, as cybersecurity threats are becoming increasingly common and complex. Introducing cybersecurity education in curricula programs at early stages and establishing partnerships between educational institutions and industry to provide real-world exposure is suggested as a solution.

Keywords: *Cybersecurity, Education, Students, Information Technologies, Social Sciences*

Fabrication of Composite Materials for Self-Cleaning Coatings to Enhance Solar Cell Efficiency

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ABSTRACT

Turkey and Albania are located in an advantageous position in the southern part of Europe in terms of the solar energy. Both countries can receive the solar light with a high intensity (~1500 kWh/m2) when compared with the most of the European countries. However, the installed photovoltaic (PV) capacity corresponds respectively 5 GW for Turkey and 10 MW for Albania which is low compared to the European countries. The installed PV capacities of both countries can only cover 2.5% of Turkey's electricity need and 1% of Albania's electricity need. In addition, both countries meet the majority of their energy needs from foreign countries, which means that both countries need to increase the installed capacity of the PV systems and maintain the efficiency of the existing PV systems to able to benefit more from the sunlight. The buildup of pollutants and contaminants on the glass covering of solar cells has a detrimental impact on the performance of PV systems, ultimately diminishing their efficiency. Our research work presents the development of the self-cleaning coatings designed for PV systems aim to mitigate the efficiency losses caused by contamination in existing PV systems across both countries. The composite materials SiO2/WO3 and SiO2/WO3/ZnO were developed and applied onto glass substrates via a dip-coating methodology using solutions prepared from their respective compositions. The results have shown that solar cell coated with the SiO2/WO3/ZnO film offered nearly equivalent solar cell efficiency levels compared to those of uncoated solar cells.

Keywords: *Solar Cell, Efficiency, Self-Cleaning Coatings, Composite Materials*

Tax Compliance from the Perspective of Electronic Developments in Taxation

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ABSTRACT

Electronic advances in taxation have brought about significant changes in tax administration, compliance with legislation and the streamlining of various aspects of practice. These changes specifically include advances in information technology, data analytics and automation to increase the efficiency, accuracy and transparency of tax processes. Electronic advances in taxation include electronic filing and payment, electronic data exchange, digital tax records and documents, automated tax compliance software, electronic auditing and enforcement, electronic tax reporting and transparency, and many other applications. Tax administration and tax compliance are closely intertwined aspects of a country's tax system, each influencing and shaping the other. A well-functioning tax administration can encourage voluntary compliance. When taxpayers perceive that the tax system is fair, transparent, and efficient, they are more likely to comply voluntarily with their tax obligations. Trust in tax authorities, clear guidance on tax laws, and accessible taxpayer services contribute to higher levels of voluntary compliance. The impact of rapidly evolving electronic changes on tax compliance is profound and multifaceted. It is especially emphasized that electronic developments facilitate communication between taxpayers and tax authorities. However, does this approach always hold true? In the article, electronic developments in taxation in Azerbaijan were investigated and taxpayers' opinions were evaluated using the interview data collection method. By analyzing taxpayers' opinions, different aspects of technological changes have been elucidated. The results obtained can be used to increase the efficiency of the tax administration system.

Keywords: *Tax Compliance, Electronic Developments, Tax Administration, Efficiency*

Enhancing education through the partnership between Vocational Schools, Universities, and NGOs in Albania

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ABSTRACT

This research explores the cooperation model between Vocational Schools, Universities, and NGOs in Albania, focusing on the benefits, contributions, and challenges each party faces. The study involved the distribution of a questionnaire to participants from the main stakeholders. The findings suggest that collaboration between these entities can lead to improved curricula, enhanced student readiness for the labor market, and the development of innovative teaching methods. The research also identifies key factors for successful collaboration, such as selecting appropriate actors, dedicating time to establish partnerships, and providing necessary support and incentives. The study concludes that understanding the time required for collaboration and effective organization are crucial elements in maximizing the success of collaborative ventures in research and development. Looking ahead, the authors propose adapting successful cooperation models from Europe to the context of Albania to promote innovation and strengthen the country's education system. Comments from participants indicate strong support for the continuation and expansion of this cooperation model to benefit all parties involved.

Keywords: *Cooperation, Vocational Schools, Universities, NGOs, Benefits, Contributions, Challenges, Education System*

On relations between Digital Development Index and ISO 27001 Standard Index, and a Comparative Analysis of Cyber Security Indicators between Western Balkan Countries

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ABSTRACT

In light of the increased global interest in digitalization, ISO standards, cyber security, digitalization indicators, etc., my goal in writing this essay was to demonstrate the links between the digital development index and the ISO 27001 index of the Western Balkan nations. The research methodology yielded the main findings of this study. Specifically, data were collected regarding the level of digitalization development index in the Western Balkans, as measured by the DDI, as well as data regarding the extent to which the ISO 27001 standard was applied in these countries. Additionally, data regarding ISO 27001 certificates were processed, an index of ISO 27001 certificates was created, and a regressive analysis was managed to examine the relationships between the digitalization development index and the ISO 27001 certificates index, while addressing cyber security issues in addition to looking at the route towards EU membership. The study's secondary findings focused on the comparative analysis of digitalization and cyber security indicators among Western Balkan nations, evaluating them to demonstrate each nation's relative advantage in using these indicators. This is due to the fact that having strong cyber defenses—derived from the comparison of CSI and DDI indicators—is essential to obtaining a competitive edge in industries including information technology, artificial intelligence, digitalization, e-commerce, and e-government. The main recommendation is that Western Balkan countries should adopt ISO standards, such as ISO 27000, especially ISO 27001, and work simultaneously to improve the use of CSI and DDI indicators and investments in the field of cyber security in order to better respond to cyberattacks and cyberthreats.

Keywords: *Digital Development Index, Digitalization, ISO 27001 Index, Western Balkans, Information Technology Management, Competitive Advantage*

Effects of Firm Characteristics on SMEs Growth: Evidence from Western Balkans

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ABSTRACT

Having into consideration the crucial importance of the growth of SMEs for every economy, it is important to identify and highlight the determinants that effect the SMEs growth process, which can derive from internal and external factors. Thus, the main objective of this paper is to highlight the effects of the characteristics of the firm on the growth of the SMEs in the Western Balkan countries, by using the latest survey data from the BEEPS survey. In this regard, by using the survey data, several regression techniques will be used to find the impact of the firm characteristics: age, size, ownership and financial transparency on the SMEs growth by using two variables: employment growth where in this case OLS methodology is used to determine the nexus, and fixed asset growth, where the probit model is used to determine the effects of the firms characteristics in the SMEs growth. Regarding the effects of the firm characteristics, the most significant effect has age and ownership of the firm, where both variables are negatively associated with the SMEs growth in the Western Balkan countries. In addition, financial obstacles also have negative effects on the growth of SMEs operating in the countries of WB region. Finally, underling the vital role of the SMEs for enhancing the employment of the Western Balkan countries, it is crucial to emphasize the need for addressing potential reforms regarding the enforcement of better regulation and efficient governance as well as providing improvement of the business environment.

Keywords: *Age, Size, Ownership, Financial Constrain, Smes Growth, WB*

Exploring the Impact of RadioFrequency Radiation

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ABSTRACT

The hastening development of wireless technology, such as the fifth generation (5G) of communication networks, has made radio frequency radiation (RFR) an essential part of our daily lives. However, there is growing concern about the potential damage that 5G poses to human life. Several wireless networks, data communication networks, or local area networks (LANs) are used in our daily lives, and we cannot avoid the influence of RFR. There are several international authorities for radio regulation that organize, plan, and regulate radio radiation regulations and standards. Where we can minimize the risks of radio emitting to protect both the environment and the public in the case mobile service providers (MSP) and other multimedia, including television, radio broadcasting, radar, etc., in the case of respecting the standards issued by the ITU-R section. This study's primary objective is to verify that the minimum RFR exposure is human. In addition, the objectives of this research are to conduct a series of radio radiation measurements in diverse locations. The measurements will be concentrated close to hospitals, public squares, facilities, schools, and kindergartens. The most significant recommendations of this study will be to assist experts in these fields and decision-makers in taking all required safety measures to protect the environment and community health.

Keywords: *Exposure Time, Transmitted Power, Frequency, Distance, Measurements, RF Propagation*

Effects of Emotional Intelligence on Entrepreneurial Intention Among Women in Tunisia

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ABSTRACT

This study aims to explore the relationship between emotional intelligence and entrepreneurial intention among women in Tunisia, an area which has been insufficiently researched despite growing interest in entrepreneurship. The study seeks to provide insights into the factors that influence women's entrepreneurial aspirations in Tunisia by examining the impact of emotional intelligence dimensions on entrepreneurial intention. The main research questions focus on how emotional intelligence influences the development of entrepreneurial intentions in Tunisian women and which key antecedents can be identified as influential factors in this association. The study aims to understand the determinants of entrepreneurial intention among Tunisian women in order to inform the design of tailored support programs and interventions aimed at promoting female entrepreneurship in the country. The study used a mixed-methods approach, beginning with a qualitative phase involving eight semi-structured interviews to identify intention antecedents. This was followed by a confirmatory phase that involved the administration of a questionnaire to 120 women intending to start a business. Data collected was analysed using the latest edition of SPSS to discern patterns and relationships among the investigated variables. The study found that self-efficacy plays a mediating function between aspects of emotional intelligence and entrepreneurial intention among Tunisian women. The facets of emotional intelligence affect the development of entrepreneurial intention by shaping their abilities to perceive and comprehend their own emotions, as well as those of others. These competencies are integral to decision-making, communication, problem-solving and cultivating relationships, which are key characteristics of successful entrepreneurs. Overall, the study provides valuable insights into the factors that influence the development of entrepreneurial intention among women in Tunisia. The findings suggest that emotional intelligence and self-efficacy are important determinants of entrepreneurial intention, and interventions aimed at promoting female entrepreneurship in the country should focus on developing these competencies among women. By providing tailored support programs that address the specific needs of women entrepreneurs in Tunisia, policymakers and business leaders can help to create a more supportive and conducive environment for female entrepreneurship in the country.

Keywords: *Female Entrepreneurship, Entrepreneurial Intention, Entrepreneurial Self-Efficacy and Emotional Intelligence*

Technology on Education from Albania's PISA 2022 Results

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ABSTRACT

The integration of technology in education has been celebrated worldwide for its potential to revolutionize teaching and learning processes. Throughout the COVID-19 pandemic, technology emerged as a lifeline for education systems, facilitating remote learning and preventing a complete disruption of the academic calendar in many countries. However, the case of Albania presents a stark contrast, revealing the potential pitfalls of indiscriminate technology use. Despite the global narrative of technology's positive role in education, Albania's experience with the Program for International Student Assessment (PISA) 2022 exposes the adverse effects of hasty and uncalibrated technology integration.

This abstract explores the nuanced dynamics of technology's impact on education, drawing insights from Albania's PISA 2022 results. While technology-enabled distance learning salvaged educational continuity in numerous countries, Albania's overreliance on technology appears to have backfired, resulting in diminished academic performance as reflected in the PISA scores. By analyzing the factors contributing to this discrepancy, including infrastructure limitations, pedagogical approaches, and digital literacy disparities, this study elucidates the complexities of technology implementation in the Albanian context.

Through this examination, critical lessons emerge for education policymakers and stakeholders worldwide. The case of Albania underscores the imperative of a balanced and judicious approach to technology integration, one that considers the unique socio-economic and educational landscapes of individual countries. Moreover, it highlights the necessity of comprehensive strategies that address not only the provision of technological tools but also the development of educators' digital competencies and the creation of supportive infrastructures. By synthesizing empirical evidence with theoretical frameworks, this abstract contributes to a deeper understanding of the multifaceted relationship between technology and education, offering valuable insights for guiding future educational reforms in Albania and beyond.

Keywords: *Pisa, Technology, Education, Reform*

Technology and Consumption Approaches of Generations as the Cornerstone of Businesses

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ABSTRACT

Consumers have a significant impact on the organization of businesses through various means such as demand patterns, product development and innovation, supply chain management, marketing and branding, feedback loops, etc. Consumer behavior is dynamic and subject to change due to various factors such as technological advances, economic changes, or cultural influences. Businesses must remain agile and adaptable, organizing themselves to respond quickly to emerging trends and consumer preferences. However, consumers' reactions to changes and emerging trends vary significantly between generations. In particular, the consumption impact of technology has reshaped the way individuals acquire, interact with, and use goods, services, and information. Additionally, technology has the potential to influence consumption patterns in ways that promote sustainability and environmental responsibility. Innovations such as renewable energy, environmentally friendly products, and digital alternatives to physical products have reduced the environmental impact of consumption. However, different generations often have different approaches to technology, influenced by factors such as upbringing, exposure, and socio-cultural context. Understanding these generational differences in technology use patterns can be valuable for businesses, educators, and policymakers to adapt their strategies and services to meet the needs and preferences of different age groups. Therefore, the main purpose of this study is to find the difference between generations' approaches to sustainable consumption in Azerbaijan. The qualitative analysis research method was used and the findings were systematized in the study. The findings of the study will help businesses reform their policies and implement more targeted policies on consumption.

Keywords: *Technology, Business, Sustainable Consumption, Generations*

Privacy-enhancing ECC Techniques in Ambient Intelligence

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ABSTRACT

Ambient Intelligence (AmI) refers to a paradigm where intelligent computing devices and sensors are ubiquitous, providing human beings with context-aware, personalized, adaptive and predictive services. Data security and privacy issues are becoming increasingly important as ambient intelligence continues to permeate many aspects of our daily lives. To solve these pressing privacy problems, this study investigates the incorporation of privacy-enhancing elliptic curve cryptography (ECC) methods into ambient intelligence systems. ECC, known for its strong security and efficient computation, offers promising solutions for safeguarding sensitive information. The Elliptic Curve Discrete Logarithm Problem (ECDLP), which highlights the intrinsic computational difficulty of ECC, serves as the foundation of its powerful security features. The study examines the basics of ECC, highlighting the functions of basic elements such as key generation, encryption, decryption, and digital signatures in preserving user privacy in smart settings. This paper presents a comprehensive overview of privacy-enhancing ECC techniques, including secure data encryption and decryption, secure message signing and verification, secure identity verification and trust and non-repudiation. Privacy issues may be efficiently handled by integrating ECC into many components of ambient intelligence systems, promoting a safe and privacy-conscious environment for users and devices.

Keywords: *Ambient intelligence, ECC, Privacy Challenges, Privacy-Enhancing Techniques, Encryption, Decryption, Digital Signature*

Position Control of Stepper Motor

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ABSTRACT

The stepper motor, power supply, and load mechanism comprise an electric drive where the moving part executes discrete step movements following voltage pulses generated by the control system. It's essentially an electric drive with angular position control, where each voltage impulse corresponds to a change in the rotor's position. Unlike other motors, stepper motors don't require feedback signals to determine rotor angular displacement, offering a significant advantage. This paper focuses on open-loop control for stepper motor control, emphasizing the preparation of suitable synchronous phase voltages to manage rotor angular displacement. The study includes modelling in the Matlab/Simulink environment and experimental implementation of a hybrid stepper motor position control system, confirming stepping behaviour through both simulation and experimentation. The control algorithm utilizes an Arduino processor, while a PWM driver A4988 is employed to supply the hybrid stepper motor winding coils in the experimental setup. Furthermore, the ability to control the direction of rotation of the stepper motor is demonstrated. The simulation results aligning closely with experimental findings.

Keywords: *Position control of stepper motor, Stepper motor control, Hybrid stepper motor*

Digital Financial Technologies and Banking: The Role of Blockchain in Improving Banking Services

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ABSTRACT

Since its introduction in 2009, blockchain technology has become a transformative force in the banking industry, creating unprecedented opportunities for banks. Using cryptographic techniques, blockchain technology provides banks a high level of transaction security, increases transparency and accuracy of transactions, provides clear control over all transactions and improves risk management, improves operational efficiency, detects fraud and ensures compliance with regulatory requirements. Blockchain technology has also helped reduce costs and increase efficiency in the banking sector by optimizing processes and eliminating intermediaries for cross-border transactions. Moreover, blockchain technology enables the tokenization of assets and increases the liquidity of previously illiquid assets. The use of blockchain technology in banking has led to the emergence of a number of problems as well as many advantages. One of the main problems of blockchain technology is scalability. The number of banking transactions is constantly increasing, which leads to a decrease in productivity and processing speed, delays and congestion. Other major concerns include privacy and security of data and transactions, regulatory compliance, cost of implementation, user experience issues, and interoperability issues among different blockchain systems. These issues pose significant barriers to banks seeking to harness the full potential of blockchain technology. Banks that embrace technological innovation and successfully address emerging challenges can gain an advantage over rival banks and position themselves as leaders in the digital banking sector. However, as of 2024, the adoption of blockchain technology in the banking sector has been slower than expected due to various market downturns and general skepticism towards cryptocurrencies. This article will highlight the benefits of blockchain for the banking sector and discuss the disadvantages that prevent this technology from becoming an ideal option for the banking world.

Keywords: *Banking, Financial Technology, Digitalization, Blockchain*

A Bibliometric Analysis of Agile Enterprise

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ABSTRACT

Agile methodologies are becoming more and more popular in software development companies due to their ability to provide flexibility, adaptation, and cooperation. However, the application of agile methodologies in larger organizations—known as Agile Enterprises—presents unique challenges that must be properly considered. Using a bibliometric method, the goal of this work is to determine the present status of research on Agile Enterprise. To find trends, patterns, and gaps in the literature, the study examines research papers from the Scopus database over the previous five years. Findings indicate that the Agile Enterprise idea is gaining traction, with studies concentrating on project management, scaling, governance, and Digital transformation. Nevertheless, there aren't many empirical studies in the literature that assess how well Agile Enterprise adoption works and how it affects organizational performance. In addition to outlining opportunities for future research and emphasizing the need for further empirical studies to help decision-making in Agile Enterprise adoption, this study offers a thorough assessment of the existing state of research on Agile Enterprise.

Keywords: *Agile Enterprise, Bibliometric analysis, Research landscape, Trends, Patterns, Themes*

Adapting Sales Strategies in Crisis: Insights from North Macedonia

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ABSTRACT

This paper aims to examine the impact of Covid-19 on sales strategies, particularly within the context of the rising prominence of e-commerce during the pandemic. Through a comprehensive analysis of existing research and the results of a conducted survey, the study seeks to advance theoretical insights into the types of sales strategies employed during times of crisis. Additionally, the research endeavors to assess the influence of these strategies on overall organizational welfare, with a particular focus on operational Key Performance Indicators (KPIs). Contrary to common assumptions, the findings challenge the notion that crisis periods lead inevitably to increased online sales, particularly through social media channels. Instead, the study reveals a significant correlation between the adoption of sales strategies and sales intensity among firms in the Republic of North Macedonia. Furthermore, moderate positive relationships between the variables under examination are uncovered, providing valuable insights into the dynamics of sales strategy implementation during crisis situations.

Keywords: *Sales Strategies, Crisis, Covid-19, E-Commerce, Sales Intensity*

Topic Modeling on Journals with Latent Dirichlet Allocation

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ABSTRACT

Nowadays, as a result of the research done in scientific studies on every subject and the advancement of technology, the number of online research journals has increased, resulting in a deep research pool that cannot be thoroughly examined. As a result of this information pool's size, it becomes difficult to reach the desired information, and the time spent is considerably increasing. To solve all these problems, it is essential to create Natural Language Processing techniques that will facilitate the examination, narrow the pool, and provide more accessible results. Latent Dirichlet Allocation is a popular Natural Language Processing algorithm for finding hidden topics in long texts. Using the Latent Dirichlet Allocation method, this study aims to examine the research in the journals and determine the subjects covered by the journal. As a result of the study, different parameters are effective in Latent Dirichlet Allocation applications. Selecting appropriate Latent Dirichlet Allocation parameters may achieve more meaningful and accurate results. It is seen that various pre-processes need to be applied, and it has been determined that a text in a different language affects the performance.

Keywords: *Natural Language Processing, Latent Dirichlet Allocation, Topic Modelling, Topic Detection, Text Mining.*

Sustainable Financing in the Financial Market of Albania: Promoting Sustainable Development in the Local Context

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ABSTRACT

This study aims to investigate the role and impact of sustainable financing in the financial market of Albania, focusing on the promotion of sustainable development in the local context. To achieve the purpose of the study, the methodology used includes the analysis of documentation, case studies, and interviews with key actors of the financial sector and civil society in Albania. The analysis is based on current legal frameworks, global trends and local sustainability challenges. Through in-depth analysis of legal frameworks and current financial market practices in Albania, it was found that sustainable financing has the potential to promote sustainable economic development and address environmental and social challenges at the local level. Also, the need for a strong commitment from financial institutions, government and civil society to encourage investments in projects and initiatives that promote sustainability is highlighted. Based on the results of the analysis, it is observed that sustainable financing has the potential to contribute to the sustainable development of the Albanian economy and society. However, to achieve sustainable results, a joint commitment from all stakeholders and an appropriate legal and policy framework is necessary. Based on the findings of the study, some key recommendations include: Raising awareness and capacity in the financial sector to use more sustainable instruments and practices, Development of favorable policies and fiscals to encourage investments in sustainable projects, encouraging cooperation between financial institutions, government and civil society to promote sustainable financing at all levels, improving transparency and information reporting to facilitate investor decision-making in sustainable projects.

Keywords: *Sustainable Finance, Financial Market, Legal Framework, Financial Institutions, Sustainable Projects*

Nexus between Innovation, Economic Growth and FDI: Evidence from Western Balkans

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ABSTRACT

Having into consideration the importance of innovation as a crucial driver of economic progress and development, the main objective of this study is to investigate the effects of innovation on the economic growth and foreign direct investments (FDI). In addition, focusing on a sample of the six economies of Western Balkans for the time period 2013 – 2022, this paper tries to highlight the innovation impact on the economic output and FDI in this region by utilizing a proxy for innovation - Global Innovation Index (GII), comprised as an average of two sub-indices: Innovation Input Index (III) and Innovation Output Index (IOI), composed of five and two pillars, respectively. The Innovation Input Index (III) five pillars consist of institutions, human capital and research, infrastructure, market sophistication, and business sophistication, while the Innovation Output Index (IOI) two pillars include knowledge and technology outputs and creative outputs. Thus, by using generalized linear models and panel corrected standard error model (PCSE), empirical findings imply positive and significant relationship between innovation and economic growth for the countries of Western Balkans for the analyzed period 2013 – 2022. On the other hand, there is no significant relationship found between GII and FDI for the Western Balkans for the time spin 2013 – 2022. Finally, underling the vital role of the innovation as one of the key drivers of the economy, this paper highlights the need for practical regulatory framework, institutional support, research and development, technology, domestic human capital to be highly supported by the national innovation policies in the support of boosting their economic growth and development.

Keywords: *Global Innovation Index, Growth, FDI, PSCE, Western Balkans*

A Systematic Review of Database Systems in Science and Engineering

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ABSTRACT

This paper attempts to fill this gap by presenting the current landscape of data management solutions/database systems used in science and engineering, providing insights into common technologies, benefits and limitations, looking for emerging trends, and identifying potential white spots that need to be addressed. It also tries to find out how these systems benefit, what the limitations are and how they are used and applied in the set of scientific and engineering fields. The present systematic review also covers a wide range of database systems, including relational databases, object-oriented databases, NoSQL databases, and graph databases, by structuring them into sub-domains. The paper continues by identifying and comparing the features, the data model and structure, the query language, the scalability, and performance, the suitability for several scientific and engineering applications domains such as data integration, usage for data analytics, data visualization, and simulation. Finally, the paper concludes by providing a series of general considerations regarding the most appropriate database system or systems for the carried-out needs and type of data (such as challenges or open research questions to be considered, especially distributed and security-related concepts), and future research and developments in the database systems field in science and engineering.

Keywords: *Database, Systematic, NOSQ, Visualization, Distributed, Security, Relational, Performance, Query. Object Oriented*

Leveraging Blockchain Technology for an Enhanced Anti-Money Laundering System

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ABSTRACT

The advent of digital currencies and blockchain technology has brought about transformative changes across various sectors, with finance being a notable area of impact. This research delves into the potential application of blockchain technology in fortifying anti-money laundering (AML) systems. The focus is on the design and deployment of a Blockchain-based Anti-Money Laundering System (B-AMLS). The primary objective of B-AMLS is to augment the detection and deterrence of illicit financial activities, such as money laundering and terrorist financing. This is achieved by harnessing the inherent features of blockchain technology, including transparency, immutability, and decentralization. The research commences with an overview of the challenges posed by money laundering that financial institutions and regulatory bodies currently face. It then transitions into an exploration of the fundamentals of blockchain technology, emphasizing its potential to revolutionize traditional AML processes. The proposed architecture of the B-AMLS incorporates distributed ledger technology, smart contracts, cryptographic techniques, and machine learning algorithms. The B-AMLS comprises key components such as transaction monitoring, risk assessment, detection of suspicious activities, and reporting mechanisms. Blockchain technology ensures secure and transparent record-keeping, while smart contracts facilitate the automation of compliance checks and the enforcement of AML policies. The integration of machine learning algorithms enhances the system's ability to detect anomalies and recognize patterns in suspicious transactions. The research also addresses the aspect of regulatory compliance, discussing how the B-AMLS aligns with existing AML/CFT (Combating the Financing of Terrorism) regulations and guidelines. The effectiveness and efficiency of the B-AMLS in detecting and preventing money laundering activities are demonstrated through case studies and simulations. In conclusion, the Blockchain-based Anti-Money Laundering System presents a promising strategy to combat financial crimes. It offers improved transparency, traceability, and accountability in financial transactions. The research concludes with recommendations for further exploration and practical implementations, aimed at facilitating the adoption of blockchain-based AML solutions in the financial industry.

Keywords: *Anti-Money Laundering System (B-AMLS), CFT, Blockchain technology, Smart Contracts, Regulatory Compliance, Cryptographic Techniques, Machine Learning.*

Advancements and Applications of Natural Language Processing: A Comprehensive Review

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ABSTRACT

Natural Language Processing (NLP) has emerged as a transformative field at the intersection of linguistics, computer science, and artificial intelligence. This paper provides a comprehensive review of the advancements and applications of NLP. Beginning with an overview of the fundamental concepts and techniques, the paper explores the evolution of NLP algorithms and models, highlighting key milestones and breakthroughs. It then delves into various applications of NLP across different domains such as healthcare, finance, education, and customer service. Furthermore, the paper discusses the challenges and future directions of NLP research, including ethical considerations and emerging trends. Through this review, we aim to provide insights into the current state of NLP research and its potential impact on society and industry.

Keywords: *NLP (Natural Language Processing), Artificial Intelligence, Privacy and Security, Education*

Analysis of the Dynamics of Agricultural Development and Production in Kashkadarya Region

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ABSTRACT

The sustainable development of the agricultural sector of Uzbekistan is largely related to the effectiveness of innovation activities. As a result of the development of innovations, the production base in agriculture is updated technologically, technically, organizationally and economically. This, in turn, will increase the integration of Uzbekistan into the world market. The sustainable development of the agricultural sector of Uzbekistan is largely related to the effectiveness of innovation activities. As a result of the development of innovations, the production base in agriculture is updated technologically, technically, organizationally and economically. This, in turn, will increase the integration of Uzbekistan into the world market. It is known that today it is necessary to direct investments to the development of agriculture, ensure the regularity of the activities of agricultural production processes, water management facilities, strengthen the equipment of agricultural producers, improve land areas, such as improving land reclamation, support for farms growing raw cotton on low-yield lands, personnel training, scientific research is supported by the state. As a result of the implementation of comprehensive measures carried out as part of the strategic development of agriculture to diversify production and ensure food independence, high rates have been achieved in the field in recent years. The level of specialization of farms is important for increasing the efficiency of their activities, improving product quality, and increasing labor productivity. From this point of view, this article analyzes the share of farmers, peasants and private farms operating in the agro-industrial complex of the Kashkadarya region in the production of agricultural products and increasing production volumes, and also develops proposals based on the data obtained.

Keywords: *Agricultural Sector, Farmers, Dehkan Farms and Personal Subsidiary Plots, Sustainable Development, Diversification Of Production, Government Support*

The Term Structure and Mechanism of the Impact of Short-Term interest rate on Long-Term Rates

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ABSTRACT

This study investigates the transmission mechanism of short-term interest rate, the policy rate, into the long-term interest rates in Albania. We use a vector autoregressive (VAR) model. Using a structural VAR framework, we analyse the dynamic responses of long-term rates to innovations in short-term rates, taking into account the expectations hypothesis and other potential transmission channels. Through our model we want to investigate the impact and timing of changes in short term interest rate on long term rates. We find strong statistically significant relationship between short term and long-term rates in various time frames. Our results have implications on considering the transmission mechanism and timing of the changes in short term rates in conducting monetary policy in Albania.

Keywords: *Policy Interest Rate, Short-Term Rate, Long-Term Rate, VAR Model, Transmission Mechanism*

Penetration Testing in an Active Directory Environment

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ABSTRACT

This thesis investigates penetration testing methodologies in an Active Directory environment. The Active Directory will be simulated using a training platform called TryHackMe, which provides prepared systems and a network environment designed to mimic real-world scenarios. The scope of the penetration testing will encompass various cybersecurity domains, including web application exploitation, antivirus evasion, pivoting, post-exploitation techniques, command and control (C2) establishment, and Active Directory attacks. The primary objective of this research is to identify vulnerabilities and misconfigurations within the Active Directory environment. By exploiting these vulnerabilities, the thesis aims to gain unauthorized access to systems and evaluate the overall security posture. The methodology will involve documenting the penetration testing process and providing recommendations to remediate the identified vulnerabilities.

Keywords: *Penetration Testing, Active Directory, pivoting, command and control, AV Evasion, Post Exploitation*

Revolutionizing Course Selection in Higher Education: A Hidden Markov Chain-Based Recommender System

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ABSTRACT

Course recommendation systems have a significant role in providing personalized educational suggestions through the analysis of student preferences, course information, and their interactions. This paper presents a sequential course enrollment recommendation system using the Hidden Markov Chain method. The system analyzes students' academic records, including past course selections and grades, to create student-specific recommendations. The recommendation process is framed as a sequential optimization problem in which the system calculates a new list of course preferences based on the student's academic background. The study includes the use of the success rates of the hidden and observed matrices derived from the Hidden Markov Chain to perform prediction tasks. These matrices are created with data based on all targeted transitions from technical courses to elective courses and success rates. Viterbi and entropy concepts are additionally utilized to constitute the Hidden Markov Chain method while considering the students' selection and the outcome, the compatibility of the course contents with each other, and the course preference and success of other students. Experimental results based on multiple experiments and various parameters outperform the traditional Markov Chain implementation by 0.15 on average accuracy. The proposed system has the potential to improve the course selection experience for students, allowing for improved academic outcomes.

Keywords: *Hidden Markov Chain, Hidden Matrix, Higher Education, Markov Chains, Observed Matrix, Sequential Course Recommendation*

Anti-MoneyLaundering System using AI

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ABSTRACT

Global financial institutions, regulatory bodies, and law enforcement organisations face serious issues as a result of the growth of financial crimes, particularly money laundering. Traditional money laundering techniques have not been enough to keep up with the sophisticated new approaches that criminals are using. As a result, integrating artificial intelligence (AI) technologies has become a viable strategy to improve anti-money laundering (AML) operations. This article offers a thorough analysis of the state of AI applications in AML today and suggests an implementation strategy for utilising AI to effectively fight money laundering. The article first looks at the fundamental ideas of money laundering and the legal environment that surrounds AML compliance. After that, it explores the shortcomings of conventional rule-based AML systems and emphasises the demand for AI-driven alternatives.Subsequently, the paper delves into diverse artificial intelligence methodologies, including machine learning, natural language processing, network analysis, and anomaly detection. It demonstrates how these technologies can enhance AML procedures by elevating risk assessment capabilities, decreasing false positives, and improving detection accuracy. The study also lists important factors to take into account for a successful AI adoption in AML, such as model openness, data quality, regulatory compliance, and ethical considerations. It highlights how crucial it is for regulators, technology companies, and financial institutions to work together to create strong AI-powered AML standards. The proposed implementation methodology provides a methodical approach to integrating AI technologies into AML workflows, drawing on best practices from the industry and case studies already in existence. Preprocessing data, feature engineering, training and validating models, deployment, monitoring, and continuous improvement are all included in this system. This article concludes by highlighting the revolutionary potential of AI in bolstering AML protocols and reducing the likelihood of financial crime. Financial institutions can improve their ability to identify, stop, and discourage money laundering activities by implementing AI technology inside a thorough implementation framework. This will protect the integrity and stability of the global financial system.

Keywords: *Financial crime mitigation, AI-driven Anti-money laundering (AML), Implementation strategy, Systematic AI integration, Regulatory alignment*

AI-Enhanced Resource Management in Cloud Environments: Integrating Requirements Engineering

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ABSTRACT

Cloud infrastructures must properly manage resources to meet the dynamic demands of new applications and services. This research investigates using artificial intelligence (AI) to improve resource allocation tactics in cloud computing. The research aims to optimize resource allocation, increase scalability, and reduce operational costs by applying AI-driven algorithms. The methodology involves developing machine learning models trained on historical data to predict resource demand and optimize allocation in real-time. Requirements engineering systematically gathers, analyzes, and prioritizes stakeholder needs, ensuring that AI solutions align with business objectives and user expectations. The results demonstrate significant improvements in resource utilization and cost savings, with AI models successfully predicting resource demand and allowing for dynamic and efficient allocation. Additionally, the integration of requirements engineering ensured that the system met all stakeholder needs, resulting in high satisfaction and user adoption. Conclusions highlight the potential of AI in enhancing cloud resource allocation and emphasize the importance of integrating requirements engineering to ensure the effectiveness and alignment of AI solutions with stakeholder needs. Recommendations for future research include enhancing the adaptability of AI models to evolving cloud environments, improving data integration techniques to support more accurate predictions, and exploring the application of advanced AI methods such as deep learning and reinforcement learning. Through a series of case studies and simulations, this research demonstrates how AI and requirements engineering can collaboratively transform cloud resource management, leading to more resilient, efficient, and adaptive cloud infrastructures. This study underscores the transformative potential of AI when integrated with traditional engineering practices to meet the growing needs of modern cloud-based systems.

Keywords: *Cloud computing, Integration, Mobile App, Key Technologies, Research*

The Importance of Computer Science to Financial Firms Around the World

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ABSTRACT

The relationship between computer science and finance has become increasingly important in today's digital age, transforming the way financial institutions operate globally. This abstract explores the significance of computer science in changing the global financial services sector. It also aims to investigate the strength of the link between Financial Firms and the IT sector and to determine if it is as important as it is perceived to be. More specifically examining, how Financial Firms operating in Albania view computer science in their daily activities and what can be done to enhance IT security. Computer science plays a critical role in creating competitiveness, advancing the evolution of financial organizations, and meeting the changing needs of clients in a rapidly growing digital world. To obtain a satisfactory answer, a literature review was conducted, and a questionnaire was sent to people working in the financial field to gain a better understanding of the real situation. Due to technological advancements, many challenges arise regarding security and adapting to innovations. The study investigates whether this is related to financial firms by examining patterns between daily activities of financial firms and computer science, along with IT security. Finally, the paper summarizes important results achieved from the collected data.

Keywords: *Financial Firms, Computer Science, IT Security, Computers*

Space Vector Pulse Width Modulation Strategy for Three Phase Inverters

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ABSTRACT

Adjustable speed drives for three-phase induction motors and permanent magnet synchronous motors necessitate varying both voltage and frequency. Achieving this requirement involves employing a three-phase voltage source inverter. There are two approaches to generate the inverter's output AC voltage with variable magnitude and frequency. The first method involves adjusting the input DC voltage of the inverter while maintaining a constant inverter gain. Conversely, the second method is utilized when the inverter's DC input voltage is fixed, allowing for adjustable magnitude and frequency in the output voltage by varying the inverter gain. Typically, the second method is preferred due to its cost-effectiveness. Various algorithms exist for controlling the output voltage of the voltage source inverter (VSI), but they all tend to produce unwanted harmonics aside from the desired fundamental frequency. To mitigate low-order output voltage harmonics, space vector pulse width modulation (SVPWM) is employed. SVPWM is a sophisticated and highly effective technique compared to other PWM methods such as sinusoidal, trapezoidal, harmonic injected, delta, and phase-shifted PWM. It efficiently generates fundamental inverter output voltage sine waves, helps reduce total harmonic distortion (THD) and dominant harmonics. This paper utilizes sector utilization in each switching period to implement the SVPWM algorithm strategy for generating adjustable frequency and amplitude output voltage in voltage source inverters. The SVPWM techniques have been simulated using the Matlab/Simulink environment.

Keywords: *Space vector pulse width modulation, Pulse width modulation techniques, Voltage source inverter*

Transforming Customer Service in Higher Education: Integrating GenAI Models for Elevating Conversational Interactions in the Private Universities Context

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ABSTRACT

In the evolving landscape of customer service within educational institutions, the adoption of Generative Artificial Intelligence (GenAI) models presents a transformative approach. This paper presents a case study on the deployment of a GenAI-powered chatbot, specifically utilizing the Generative Pre-trained Transformer (GPT) framework, within private universities in Albania. The chatbot, named UNIGPT, is designed to handle inquiries in the Economics and Engineering domains, offering a dual-functionality interface that serves as both an independent AI entity and a support tool for human agents. UNIGPT can manage simultaneous dialogues, effectively streamlining customer service operations by providing real-time, summarized conversation insights. These insights are not only crucial for immediate contextual understanding but also for long-term strategy, as they are stored and analyzed through an integrated PowerBI database, enabling comprehensive reporting and data-driven decision-making. The core of this paper highlights the significant advantages of incorporating GenAI in customer service, particularly emphasizing its role in conversation summarization, intent recognition, and sentiment analysis. The findings point out the potential of GenAI to revolutionize customer interaction, showcasing their significant impact, increasing the efficiency and effectiveness of service delivery in the academic sector.

Keywords: *GenAI Models, GPT, Chatbot, Interface, Summarization, Sentiment Analysis, Intent Recognition, PowerBI, Reporting*

How to Preserve Students' Engagement Through Google Classroom Activities? A Case Study with Legal English Students at SEE University

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ABSTRACT

In recent years, the integration of technology in education has transformed traditional teaching and learning paradigms, offering new avenues for interaction, collaboration and engagement. Among the plethora of digital platforms available to educators, Google Classroom has emerged as a powerful tool for facilitating remote and blended learning environments. While Google Classroom presents numerous advantages, one of its most critical challenges lies in sustaining student engagement over time. In the digital field, where distractions abound and attention spans can be fleeting, maintaining students' focus and motivation throughout Google Classroom activities is a constant concern for educators. Therefore, there is a pressing need to explore and implement effective strategies that can preserve and enhance student engagement within this virtual learning environment. This paper aims to explore various strategies employed by educators to foster and sustain student engagement in Google Classroom activities. By examining existing research findings, practical insights from experienced educators, and innovative approaches, we seek to provide a comprehensive overview of best practices in this domain.

Keywords: *Google Classroom, Technology, Activities, Engagement*

Quantum Key Distribution: An Approach to Enhanced Security with Machine Learning and Decoy States

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ABSTRACT

Traditional communication channels face significant vulnerability to eavesdropping. Although Quantum Key Distribution (QKD) provides a secure solution, the analysis of information from decoy states—utilized to detect eavesdropping—poses challenges due to its complexity and computational expense. This thesis aims to investigate methods to bolster the security of QKD protocols through the fusion of machine learning techniques with the concept of decoy states. Decoy state methodologies serve to identify eavesdropping attempts in QKD systems. By employing machine learning models, the objective is to automate the analysis of decoy states, potentially leading to more precise security assessments. The research will involve a comprehensive review of existing literature, simulation of QKD protocols incorporating decoy states using quantum computing libraries, extraction of pertinent features from the data, development and training of machine learning models, and subsequent evaluation of their efficacy in enhancing security analysis. The paper will utilize Qiskit for quantum computing simulations, along with Scikit-learn and TensorFlow in Python for machine learning implementation.

Keywords: *Quantum Key Distribution (QKD), Decoy states, Machine learning techniques, Security enhancement, Eavesdropping detection, Quantum computing simulations*

Analysis of Sustainability Assessment Tools for European Cities in Urban Areas

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ABSTRACT

Sustainable urban design and planning is crucial, but with numerous assessment tools available, it can be challenging to identify the most effective ones. An analysis of 18 urban sustainability indices and 7 systems of indicators revealed a significant variation in the variables used to evaluate sustainability levels. There is also a disproportionate focus on traditional sustainability dimensions, and these tools are often employed on a large scale without considering initial design levels, making it challenging to introduce thresholds. To address this, we need a cross-cutting approach that emphasizes continuous monitoring and mainstreaming of sustainability policies based on real data. Our paper compiles assessment tool variables and aggregates indicators to reflect traditional sustainability dimensions, proposing commonly accepted indicators that characterize sustainability in European urban areas. We will use a "meet in the middle approach" that integrates a top-down approach, ensuring a set of indicators that meet specific criteria, and experts' viewpoints from a bottom-up approach, resulting in a comprehensive index that bridges the gap between sustainability assessment tools and holistic city characterization. Ignoring the need for sustainable urban design and planning is not an option. Taking this approach ensures that our cities' design is not only functional but also environmentally and socially responsible.

Keywords: *Sustainability, Sustainable Urban Design, Sustainability Dimensions, European urban areas*

Enhancing Cybersecurity: A Machine Learning Approach to DDoS Attack Detection and Mitigation

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ABSTRACT

Distributed Denial-of-Service (DDoS) attacks pose a significant threat to cybersecurity, aiming to cripple network services and prevent legitimate users from accessing resources. This research proposes a novel approach to enhance network security and surveillance by developing a system for DDoS attack detection and mitigation. The proposed system leverages a multi-faceted approach, integrating machine learning, anomaly detection, and network traffic analysis techniques. Machine learning algorithms will be trained on historical network data to identify patterns and deviations indicative of DDoS attacks. Additionally, anomaly detection techniques will be employed to recognize unusual traffic patterns in real-time. By combining these methods, the system aims to achieve robust and adaptable DDoS attack detection. To further fortify network defenses, the system will incorporate proactive measures alongside detection capabilities. These measures may include implementing firewalls, intrusion detection systems (IDS), and rate-limiting mechanisms to restrict malicious traffic and protect critical network resources. The effectiveness of the proposed system will be evaluated through simulations and real-world case studies across diverse network configurations and attack scenarios. The research aims to demonstrate promising results in accurately detecting and mitigating DDoS attacks, ultimately contributing to enhanced network security. This research emphasizes the importance of proactive measures in combating DDoS attacks and offers valuable insights and solutions to network administrators and security professionals. The findings aim to assist in fortifying systems against the ever-evolving landscape of cyber threats.

Keywords: *DDoS Attacks, Cybersecurity Enhancement, Anomaly Detection, Machine Learning Integration, Network Traffic Analysis, Proactive Defense Mechanisms, Network Security*

Enhancing Passenger Transportation Systems with Artificial Intelligence

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ABSTRACT

Artificial intelligence systems, both textual and spoken, are gradually integrating into our daily life. Today, we can find them as help systems on websites, as interactions when we want to book a plane, train ticket, learn more about a company on social media, execute an online transaction, or reservation. None of this would be possible without neural networks and the development of Natural Language Processing, which can not only interpret complex human phrases but also respond in the same format. It is in human nature to communicate by speech, which is why the future of speech applications looks promising thus it is not unexpected that virtual assistants like Siri, Alexa, and Google Assistant can be found in practically every home. This article will explore the fundamentals of voice processing and creation, as well as showcase the use of a virtual station for public transportation, highlighting the advantages, disadvantages, and potential of implementing such an application in the real world.

Keywords: *Speech, Speech Processing, Automation, Mechatronics, Virtual Station*

Advanced Computer Architecture Optimization for Machine Learning/Deep Learning

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ABSTRACT

The recent progress in Machine Learning (ML) and particularly Deep Learning (DL) models exposed the limitations of traditional computer architectures. Modern algorithms demonstrate highly increased computational demands and data requirements that most existing architectures cannot handle efficiently. These demands result in training speed, inference latency, and power consumption bottlenecks, which is why advanced methods of computer architecture optimization are required to enable the development of ML/DL-dedicated efficient hardware platforms. The optimization of computer architecture for applications of machine learning and deep learning becomes critical, due to the tremendous demand for efficient execution of complex computations performed by Neural Networks (NN). This paper reviewed the numerous approaches and methods utilized to optimize computer architecture for ML/DL workloads. The following sections contain substantial discussion concerning the hardware-level optimizations, enhancements of traditional software frameworks and their unique versions, and innovative explorations of architectures. In particular, we discussed hardware including specialized accelerators, which can improve the performance and efficiency of a computation system using various techniques, specifically describing accelerators like CPUs, GPUs and TPUs.(...), parallelism in multicore architectures, data movement in hardware systems, especially techniques such as caching and Address sparsity, compression, and quantization, other special techniques and configurations, such as using specialized data formats, and measurement Sparsity. Moreover, this paper provided a comprehensive analysis of current trends in software frameworks, Data Movement optimization strategies, sparsity, quantization and compression methods, Utilizing using ML for architecture exploration, and, DVFS, which provides strategies for maximizing hardware utilization and power consumption during training, machine learning, dynamic voltage, and frequency scaling, runtime systems. Finally, the paper discussed research opportunity directions and the possibilities of computer architecture optimization influence in various industrial and academic areas of ML/DL technologies. The objective of implementing these optimization techniques is to largely minimize the current gap between the computational needs of ML/DL algorithms and the current hardware's capability. Subsequently, the benefits accruing from optimizing these techniques will be multi-faceted, including; a massive reduction in the duration of training, real-time inferencing capabilities for a plethora of applications, and ultimately the realization of cutting-edge machine learning algorithms' full potential.

Keywords: *Computer Architecture Optimization, Machine Learning, Deep Learning, Parallelism, Sparsity, Data Movement Optimization, Quantization, Compression, Software Framework Optimization, DVFS, TPU, CPU, GPU*

Augmented Reality Potential of Usage in Education

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ABSTRACT

The purpose of this comprehensive research study is to critically examine the transformative potential of augmented reality (AR) technology in educational settings across various disciplines and levels. Through an extensive review of existing literature and case studies and and empirical evidence and this study employs a mixed methods methodology and combining qualitative analysis of published research with quantitative data from surveys and experiments involving AR enabled learning experiences. The results demonstrate that AR offers a powerful tool for enhancing engagement and motivation and and knowledge retention among learners. By seamlessly blending digital content with the physical world and AR facilitates experiential and contextualized learning and catering to diverse learning styles and promoting active participation. However and the successful integration of AR in education faces challenges and including technological infrastructure requirements and cost considerations and content development needs and and the necessity for effective teacher training. The study concludes that AR holds immense promise in revolutionizing educational practices and but its full potential can only be realized through a strategic and collaborative approach. Recommendations include developing robust implementation strategies and aligning AR experiences with sound pedagogical principles and fostering cross disciplinary collaboration and and establishing comprehensive professional development programs for educators. Additional data highlights the positive impact of AR on academic performance and with students demonstrating improved conceptual understanding and problem solving abilities when engaged in AR based learning activities. Ultimately and this research paper provides a comprehensive analysis of the vast potential of AR in education while acknowledging the challenges that must be addressed to pave the way for its widespread and effective adoption.

Keywords: *Augmented Reality, Immersive Learning, Educational Technology, Pedagogical Innovation, Experiential Education*

Technology and Psycho-education

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ABSTRACT

Psychoeducation can be provided in a variety of formats, including individual sessions, group workshops, or as part of a comprehensive mental health treatment plan. It is often used in conjunction with other therapeutic interventions and may involve collaboration between mental health professionals, individuals and their support networks. This approach is not limited to specific mental health conditions and can be implemented in a variety of settings, including schools, workplaces, and community organizations, to promote mental health awareness and wellness. Psychoeducation includes a variety of techniques and tools to impart knowledge and skills related to mental health. The specific techniques used may depend on the goals of the psychoeducational program, the target audience, and the context in which it is delivered. The use of techniques and tools in the support of psychoeducation is crucial for several reasons, as it increases the effectiveness and efficiency of the educational process in the field of mental health. The use of techniques and tools in the support of psychoeducation is crucial for several reasons, as it increases the effectiveness and efficiency of the educational process in the field of mental health. This paper is based on the following hypothesis: The strategic application of various psychoeducational techniques plays a crucial role in increasing psychological well-being, promoting effective learning and promoting mental health awareness among individuals. In support of the hypothesis, in this paper we will examine some techniques and supporting tools for work in psychoeducation. We will also focus on psychological well-being and how these techniques affect it. We will also examine the role of psychoeducational techniques in promoting active learning. In summary, psychoeducation is a valuable tool for promoting psychological well-being by providing education, skills and support that contribute to a more informed and resilient individual. The link between the two lies in empowering individuals to understand, manage and improve their psychological well-being through knowledge and practical application with the powerful support of contemporary technology.

Keywords: *Motivation, Psycho-education, Psycho-social, Technology, Well-being*

Methods for Determining Defects in Asynchronous Motor

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ABSTRACT

Induction machines, crucial in various industrial sectors and the economy, are sought after for their dependable and secure functioning. Their faults or malfunctions can cause prolonged downtimes and significant financial losses, driving the need for continuous online condition monitoring. This monitoring involves real-time measurements during operation to swiftly identify faults, thereby mitigating unexpected failures and reducing maintenance expenses. This paper commences by scrutinizing the typical operation of asynchronous motors, followed by an examination of their behavior under abnormal conditions such as stator or rotor winding defects. Through theoretical analysis of breakdown scenarios, parameters linked to emerging defects are identified, guiding the selection of appropriate detection methods during motor operation. The alignment between theoretical analysis and experimental data from the Laboratory of Electric Machines reinforces the findings of this study.

Keywords: *Induction Machine, Condition Monitoring, Faults, Detection Methods*

Optimizing Dredging Frequency Prediction in the Port of Durres Using Machine Learning and Python

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ABSTRACT

The Port of Durres in Albania faces significant challenges in maintaining optimal water depths due to sediment accumulation and unpredictable environmental factors. Efficient dredging operations are essential for ensuring safe vessel navigation and port functionality. However, these operations often incur high costs associated with machinery, specialized labor, and environmental impacts. Through this research, the aim is to develop predictive models and optimization strategies that enable port authorities to make informed decisions regarding the timing and frequency of dredging processes as necessary for the Port of Durres. By forecasting sedimentation trends, the goal is to reduce costs, minimize environmental impact, and ensure the continued safety and competitiveness of the port. The research methodology encompasses four key steps: problem formulation and data collection, data preprocessing and visualization, model training, and model evaluation. Data-driven approaches, leveraging Python for analysis, modeling, and implementation, will be employed. Regression analysis, time series forecasting, and potentially machine learning models will be utilized for predictive modeling. The visualization of data will aid in understanding patterns and trends crucial for decision-making. Google Colab will serve as a platform for interactive development and experimentation, with additional tools incorporated as needed throughout the research process. In conclusion, the integration of machine learning algorithms offers a pivotal advantage, facilitating the accurate prediction of the optimal periodicity for dredging processes. This capability not only streamlines operations but also translates to significant time and cost savings. Furthermore, as the project is developed using Python, it ensures accessibility and flexibility for future enhancements or updates. This versatility empowers programmers to seamlessly adapt this project for application in new ports in Albania, thus fostering continuous improvement and innovation in maritime port management practices.

Keywords: *Dredging Frequency, Prediction, Machine Learning, Port of Durres, Python*

Competition Law Enforcement in Albania: Challenges from Online Giants

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ABSTRACT

The rise of the digital economy has challenged the traditional enforcement of competition rules. Many countries have amended their domestic competition legislation to address the behaviour of large online platforms. Also, the EU adopted a regulation, commonly known as the Digital Market Act, to address the gatekeeper power of the largest digital companies. On the other hand, the competition bodies are restructuring their structure by establishing a unit or appointing a person to deal with large online platforms. In Albania, the situation is quite different. Addressing the challenges of technological development is a priority of the Albanian Competition Authority. However, no legislative measure has been introduced. This paper discusses the enforcement of competition rules in the Albanian digital market and the main challenges that the Albanian Competition Authority faces with online giants. The main methodology is that of doctrinal legal research, which consists of an analysis of the current competition legislative act and the Albanian Competition Authority case law. After a short introduction, the second section provides an overview of the features of the digital economy and platforms. Then, the paper analyses recent legislative acts adopted in the EU and Germany, outlining the main novelties introduced (third section). The fourth section deals with the current legal framework for Albanian competition and the challenges faced by online giants. The paper argues that the ACA's role in the digital market enforcement is inexistent due to the absence of i) a regulatory legal framework, ii) a sufficient number of human resources and iii) sufficient financial, technical and technological resources to deal with the digital market.

Keywords: *Digital Economy, Albania Competition Law, Albanian Competition Authority, Online Platforms*

Mobile App Development for Cyber Bullying Detection in Albanian Language

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ABSTRACT

This research paper presents the development of a mobile application aimed at detecting cyberbullying incidents within the Albanian language context. Given the widespread use of social media and online platforms, cyberbullying has emerged as a pressing issue that necessitates innovative solutions for early detection. The research employs a multidisciplinary approach, integrating techniques from mobile application development, machine learning (ML), and natural language processing (NLP). Data collection methods include the utilization of an online forum and social media corpus comprising text samples in Albanian. ML models are trained to categorize cyberbullying, while NLP techniques are employed for text preparation and feature extraction. Preliminary results, based on machine learning methodologies, indicate the feasibility of identifying Albanian cyberbullying content. The developed mobile application can recognize potentially harmful texts and promptly alert users, thereby facilitating timely assistance and intervention. This research is pivotal in combating cyberbullying in Albanian-speaking communities. The application fosters safer online environments and promotes digital well-being. The study underscores the importance of incorporating linguistic and cultural considerations when developing adaptable cyberbullying detection algorithms for diverse linguistic contexts.

Keywords: *Cyberbullying Detection, Mobile App Development, Natural Language Processing, Machine Learning, Albanian Language*

Impact of the Materiality and Audit Risk Judgments on Auditor's Report

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ABSTRACT

This study delves into the influence of materiality and audit risk judgments on the reliability and content of auditor's reports, pivotal aspects of the auditing process that shape the nature, timing, and scope of audit procedures. Despite their significance, there is a limited quantity of research on how these judgments impact the final audit report. Using a qualitative methodology centered on questionnaires and extensive literature review, this study gathers insights from experienced auditors. The questionnaire aims to reveal factors affecting materiality and audit risk judgments, the challenges auditors encounter in making these judgments, and the perceived effects on the quality and credibility of auditor's reports. The study expects unveiling the primary drivers behind materiality and audit risk judgments, including regulatory demands, client attributes, and auditor's professional judgment. The findings are expected to offer valuable insights for auditors, standard setters, and regulators, aiding in enhancing the quality and relevance of audit reports. By comprehending the influence of materiality and audit risk judgments, auditors can refine their audit procedures' efficacy and bolster the credibility of their reports. This study also contributes to the existing literature by furnishing empirical evidence on the factors shaping materiality and audit risk judgments in the auditing field.

Keywords: *Materiality Judgment, Audit Risk Judgment, Auditor's Report, ISA*

E-Learning Platform

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ABSTRACT

The evolution of technology has had a great impact on every aspect of people's everyday life, which encompasses their education as well. Traditional educational methods are becoming outdated and inefficient in grabbing the attention of the younger generations. The appearance of new emerging technologies, such as Artificial Intelligence, Virtual Reality, and Augmented Reality, has provided an opportunity to implement these technologies to create a new and exciting approach to learning. In this context, an E-learning program will be developed. The related platform will allow both students and instructors to register their accounts separately. The instructors will need to undergo a background check, providing their credentials and accreditations to be approved as instructors. The platform will allow users to choose their level of education, that way material is more tailored to their needs. Regarding the tests, the platform will return automated responses and grading to the user. According to the mentioned, the platform will use AI to enhance the learning experience, with all subjects but especially with subjects regarding language learning. Next to that, the platform will provide AI-powered virtual labs for subjects such as programming, physics, and similar. Furthermore, users will be able to save any progress made and to come back if wanted. The execution of this platform will not only offer a new way of learning but also solve the problem of mismatch that modern society is facing about education, what the platform offers is traditional teaching methods that are being supported but performed in a modern and vibrant way.

Keywords: *E-Learning, Software Engineering, Artificial Intelligence, Development, Students, Education*

Advancing Malware Classification through Deep Learning Techniques

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ABSTRACT

The primary objective of this research is to design and implement a sophisticated model, based on deep learning methodologies, for the purpose of classifying malwares into specific groups. This classification is based on their unique behavioral attributes and defining characteristics, which are often indicative of their origin, purpose, and potential impact. The methodology section of this research provides an exhaustive examination of the chosen deep learning frameworks and data manipulation methods. These have been selected after careful consideration of their suitability and effectiveness in the context of malware analysis. The focus is on their utilization in the extraction of features from malware and subsequent classification. This process involves the identification and extraction of key characteristics from each malware sample, which are then used as input for the deep learning model. The results section will validate the effectiveness of the proposed model via comprehensive evaluation measures. These measures have been chosen to provide a balanced view of the model's performance across various aspects. The primary metrics of interest include classification precision, false positive occurrences, and the model's adaptability to scale. Each of these metrics provides valuable insights into the model's performance and its potential for real-world application. In the discussion, we will undertake a critical evaluation of the model's performance, taking into account its potential applications in real-world cybersecurity contexts. This includes an analysis of how the model's performance could impact current cybersecurity practices and what it could mean for the future of malware detection and prevention. Furthermore, we will propose directions for future research and enhancements in this domain. This could include potential improvements to the model, exploration of other deep learning techniques, or the development of complementary methods for malware detection

Keywords: *Deep Learning, Malware Classification, Cybersecurity, Artificial Intelligence, Scalable Detection*

Leveraging Big Data Analytics for Enhanced Healthcare

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ABSTRACT

Healthcare is among the many industries that have seen a change in recent years due to the widespread adoption of big data and analytics technologies. This paper provides a thorough analysis of how big data and analytics have improved healthcare decision-making worldwide. The review covers a wide range of applications, approaches, difficulties, and prospects in this emerging topic. The field of big data analytics in public health involves gathering, analyzing, and interpreting large-scale data sets from many sources, such as wearable technology, social media, electronic health records, and environmental sensors. These data sources provide insightful information about changes in population health, healthcare utilization, risk factors, and disease patterns. Public health authorities can obtain actionable insight to guide decision-making processes by utilizing sophisticated analytical tools including machine learning, predictive modelling, and data visualization. Numerous case studies demonstrate the effectiveness of big data analytics across a range of public health disciplines. Predictive modelling approaches, for example, have been applied to anticipate disease outbreaks, allowing for the timely planning of interventions and the allocation of resources. Targeted health promotion programs have benefited from the real-time monitoring of public opinion and health-related behaviors made possible by social media mining. Furthermore, efforts towards personalized care have been made easier and patient outcomes have been enhanced by the examination of electronic health records. There are a number of obstacles in the way of big data analytics in public health, despite its enormous promise. These include challenges with data quality, privacy, and interoperability, as well as the digital divide. To further reduce potential biases and guarantee appropriate data utilization, ethical issues pertaining to permission, openness, and equity must be properly addressed. The use of big data and analytics in public health decision-making seems to have a bright future. Technological developments in data integration, artificial intelligence, and interoperability standards have the potential to significantly increase the precision, promptness, and applicability of public health interventions. Governments, academic institutions, business, and civil society organizations must work together to fully utilize big data analytics in order to protect population health and advance well-being globally.

Keywords: *Big data, Healthcare, Medicine, Enhanced Decision-making, Analytics*

A Novel Milk Stock Exchange Model with Digital Transformation

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ABSTRACT

Price volatility and lack of transparency plague the dairy industry and squeezing farmer compensation despite production pressures. Existing market structures in Albania fail to capture production costs and market dynamics and hindering sustainable growth. This study addresses this gap by proposing a novel Milk Stock Exchande model. Current research often focuses on isolated aspects like farm management or processing efficiency and neglecting holistic supply chain transformation and integrated digitalization with machine learning in analyzing and predicting market trends. Existing literature also lacks models that address the core issue of fair pricing for dairy farmers. Our research introduces a novel Milk Stock Exchande model that leverages digitalization to create a transparent and efficient market platform for milk trading. By integrating farm level management information systems with processing facility optimization solutions and machine learning for market analysis and prediction and the model offers a comprehensive approach. This study recommends a strategic roadmap for sustainable digital transformation within the dairy supply chain and promoting fair compensation for farmers and overall industry stability. The Milk Stock Exchande model presents a promising avenue for transforming the dairy industry. Further research is recommended to explore specific implementation strategies and including pilot programs and economic modeling using data science.

Keywords: *Dairy Pricing, Milk Stock, Exchande Model, Digitalization, Machine Learning, Sustainable Supply Chain, Transformation*

Intrusion Detection Utilizing Random Forest Algorithm

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ABSTRACT

This research delves into the enhancement of intrusion detection systems (IDS) through the integration of machine learning, specifically employing the Random Forest algorithm. The IDS is instrumental in monitoring network activities, identifying potential security threats, and ensuring adherence to security protocols to maintain system confidentiality, integrity, and availability. A comprehensive review of existing literature provides insights into various IDS types, anomaly detection methodologies, and applicable machine learning algorithms for effective classification and detection. We propose an advanced architecture for IDS, augmented by machine learning techniques to enhance attack detection and categorization efficacy. The selected machine learning algorithms will undergo rigorous testing in a simulated environment to assess their performance metrics and reliability. Within the scope of industrial control systems, this study aims to establish a benchmark for selecting optimal machine learning algorithms conducive to enhancing general intrusion detection mechanisms.

Keywords: *Intrusion Detection Systems (IDS), Network Security, Machine Learning Integration, Random Forest Algorithm.*

Urban Security and the Crime Rate in Smart Cities

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ABSTRACT

Cities have become places that not only offer the possibility of living for their citizens but also serve as centers for all other events related to society, community and beyond. Rapid changes witnessed by all of us impose an obligation to adapt and respond to the challenges of technology in a better, more efficient and safer way. Smart cities are an idea that involves providing all the benefits and advantages of technology to their citizens, thereby easing their lives. It is based on equal access to technological conveniences for all citizens, but also on the possibility of using private data. Regarding with the theme of this paper, the focus will be on analyzing the crime rate and the application of technology in smart cities, specifically how it affects the reduction or increase in the crime rate. Additionally, factors such as crime prevention and urban security will be considered as closely related aspects of this field. Other factors from the perspective of smart cities, technology and urban security will also be examined in the paper.

Keywords: *Smart cities, Crimes, Crime rat, Urban security, Technologies*

Machine Learning Network Intrusion Detection: Web-Based Threat Analysis

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ABSTRACT

Protecting computer networks from cyber threats and unauthorized access is a critical challenge in today's connected world. Network intrusions can lead to data breaches, operational disruptions, and significant financial and reputational losses. This research aims to develop a web-based tool that can effectively detect and analyze network intrusions using machine learning techniques. By providing a user-friendly web interface, the tool will enable network administrators and security professionals to upload a file and identify and mitigate potential threats. The research will explore different types of machine learning algorithms and compare their performance for network intrusion detection. The methodology will involve data preprocessing, feature extraction, model training, and evaluation using relevant network traffic datasets. The developed models will be integrated into a web-based application for easy user interaction and visualization. The implementation will utilize Python programming language, popular machine learning libraries, and TensorFlow. The web-based user interface will be built using the Streamlit framework, allowing users to upload network traffic files for analysis and detection of potential attacks.

Keywords: *Network intrusion detection, Machine learning, Web-based threat analysis, Cybersecurity, Data preprocessing, Model evaluation, Web-based application*

Ontology Matching and Management using Machine Learning Aspects

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ABSTRACT

Industry 4.0 is a brand-new generation of data era that ambitions to expand expertise bases for tracking developments in enterprise 4.0. This paper proposes a framework to cope with the improvement of Knowledge Bases for Monitoring Trends in Industry4.zero. In this framework, we suggest an ontological model (COInd4 ontology) for the manufacturing area that describes the assets and strategies with inside the manufacturing unit and sensor observations are analyzed via way of means of remark effects the use of contextual data past classical reasoning mechanism for stopping the forecasted undesired sensor effects that have an effect on from concept. The framework is primarily based totally on an information-pushed technique for Knowledge Graphs (CSV, JSON, and diverse styles of information) technique for growing Machine studying interoperability combining principles from diverse current ontologies for discovered predictive fashions and execution of the fashions. Moreover, LOTHBROK is designed for estimating cardinalities and taking attention of information locality. The assessment confirmed that TAO can gain appreciably quicker question processing overall performance as compared to the nation of the artwork while processing difficult queries in addition to while. Besides, TAO gives better transparency, flexibility, and cognitive ergonomics than its options: Ontology and Accommodation Ontology. It affords a custom designed approach to abide via way of means of the necessities of the Greek Programme Diavgeia and proposes on the identical time an approach to encode authorities and administrative decisions/acts that might be universally followed to combine public files produced via way of means of different EU Member States, with positive changes content wise.

Keywords: *Semantic Web; Web protection; Ontology matching; Knowledge base.*

Transformative Solutions for Albanian Language: A Machine Learning-Powered Thesaurus Website

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ABSTRACT

In a world where language tools are evolving rapidly, the need for sophisticated solutions in lesser-known languages like Albanian is more apparent than ever. This thesis proposes the development of an innovative thesaurus website, rooted in the Angular framework and powered by cutting-edge machine learning techniques. By seamlessly integrating machine learning algorithms, the aim is to revolutionize the functionality of Albanian language tools, offering users a dynamic and potent experience. The incorporation of advanced natural language processing methods promises to deliver precise word associations, enhancing the comprehension and expression of the Albanian language. Additionally, by retrieving data from the Albanian dictionary, positive results are anticipated. Through the fusion of Angular frontend development with machine learning capabilities, this research endeavors to provide a transformative solution for language enthusiasts and scholars alike.

Keywords: *Thesaurus website, Angular framework, Machine learning, Natural language processing, Albanian language tools*

Impact of Automation in Accounting in Azerbaijan

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ABSTRACT

Improvement of technology has grown recently and made automation valuable in every field. Moreover, expanding processes in entities that represent their country in the world market need to automate each stage of production to achieve high quality. Despite the development of technology, which has decreased demand for some professions, some people say, accounting is the systems that require human intervention that are deemed to be more relevant automation. Addition of some articles about electronic audit to Tax Code of Azerbaijan Republic 3 or 4 years ago made necessary to automate accounting transactions. So, on 22 January 2024, President of Azerbaijan Republic signed decree about implementation automation in accounting systems in large and public entities. Automation in accounting decrease waste time to do regular processes that can be done automatically, but in other way increase processes of analyzing information. Also accounting software that is implemented in local entities has some problems in recording transactions according to IFRS. Companies of our Republic need accounting software that accepted in government level far from inconsistency.

Keywords: *Automation in Accounting; Electronic Audit, Accounting Software*

Design and Implementation of a Dynamic Zero Trust Network Architecture: A Case Study in Albania

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ABSTRACT

In the face of escalating cybersecurity threats, the adoption of a Zero Trust Network Architecture (ZTNA) has become a critical defensive strategy for organizations. This paper presents a novel approach to designing and implementing a dynamic ZTNA framework, specifically tailored to tackle contemporary security challenges encountered by Albanian enterprises. Our proposed framework integrates key components such as continuous authentication, micro-segmentation, and extensive network traffic visibility. It employs advanced machine learning algorithms to dynamically adjust access controls based on real-time risk assessments, user behavior analytics, and contextual data. This ensures that access privileges are granted on a need-to-know basis, thereby reducing the risk of unauthorized access and lateral movement within the network. The framework also incorporates robust encryption protocols and multifactor authentication mechanisms to protect data both in transit and at rest, in compliance with Albania's regulatory standards. By enforcing granular access policies, it minimizes the attack surface and bolsters resilience against both insider threats and external breaches, effectively addressing region-specific cybersecurity challenges. Furthermore, the architecture integrates automated threat intelligence feeds and anomaly detection capabilities, enabling proactive identification and response to potential security incidents. Real-time monitoring and centralized management tools equip administrators with actionable insights, facilitating swift threat mitigation and regulatory compliance enforcement. In conclusion, our dynamic ZTNA framework, contextualized for Albania, provides a scalable and adaptive solution to strengthen cybersecurity defenses in an era of ubiquitous connectivity and digital transformation. By prioritizing security across all network infrastructure layers and addressing Albania-specific challenges, organizations can effectively mitigate risks, protect critical assets, and maintain stakeholder trust in a rapidly evolving threat landscape. Future research could investigate the scalability and performance implications of implementing this dynamic ZTNA framework in large-scale environments globally, providing valuable insights for organizations seeking to enhance their global security posture.

Keywords: *Zero Trust Network Architecture (ZTNA), Dynamic Framework, Cybersecurity Challenges, Machine Learning Algorithms, Threat Intelligence, Continuous Authentication*

The Performance of the Activity and the Role of Active Economic Enterprises in the Increase of Employment and the Development of Economic Progress in Albania

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ABSTRACT

This study aims to present the evaluations, the role and the distinguishing features of the activity performance of active economic enterprises that operate on a prefecture and regional basis. The turnover of the annual balance according to the economic activity is related to the size and the weight that they occupy, which affects the reduction of unemployment by encouraging the economic progress of the development of the region. The investigation of the differences encountered in the progress of economic and social development (as many distinctive phenomena are found in the structure of the employment rate according to the branches of the economy) enables the drawing of attention in the design of management strategies and visions. The selection of variables is aimed at studying the effects that influence the increase in the efficiency value of active economic enterprises. This paper presents a generalization of the aspects and value of the role of active enterprises in employment according to the branches of the economic structure and the improvement of the economic well-being of each prefecture. The study enables the recognition of best practices as well as inefficiencies in the performance value by applying the DEA method. The study extends to the period 2018-2022. This study presents an alternative for continuous and comprehensive managerial studies.

Keywords: *Employment, Economic Structure, Annual Turnover, DEA Method*

ML Driven Security Measures for RDBMSs, SQL Injection in SQL Server

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ABSTRACT

Information sharing and gathering in applications is the most common activity that each of us participates in a day to day basis. These apps collect data from users and typically store this information within databases, thus presenting a prime target for potential security breaches. With repeated, data security breaches, security is increasingly seeking the attention of data centric professionals. Of particular concern is the vulnerability posed by Structured Query Language Injection (SQLi) which is one of the most and easy common cyber security attacks of an application's database, most of the times by exploring the usual log in forms these applications have. SQL Injection attacks can grant malicious actors not only structural information of database, but also unrestricted access to the entire database. Database Administrators (DBAs) in modern times, are relying on machine learning methods for security measures for the SQL Injection based threats. This paper will check into the usage of established machine learning methodologies alongside the development of new approaches to identify SQL Injection vulnerabilities and anomalous activities within SQL Server Databases. The research methodology involves the integration of two different environments, on premise which will include a Java GUI based application connected to a SQL Server, T-SQL and on cloud, particularly on Azure for the usage of online storage and ELT pipelines to serve data to Azure Machine Learning Studio, for creating patterns for SQLi detection. Also, at the end of the paper, we with see some countermeasures used to prevent these dangerous SQL antipatterns. With all that said, by using technologies that span in different environments, this research aims to provide key insights into enhancing the security portion of on-premise databases in the hypermodern landscape of cyber threats and vulnerabilities.

Keywords: *Machine Learning; Security Measures, RDBMS, SQL Injection, SQL Server, Cybersecurity*

The Role of Technology in Long Life Learning of Women in Azerbaijan

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ABSTRACT

By embracing lifelong learning, individuals can adapt to the demands of a rapidly changing world, pursue their passions, and live satisfying and productive lives. The importance of lifelong learning is countless as it provides numerous benefits to the individual and society. Promoting lifelong learning requires a change in societal attitudes toward education and training. The concept of lifelong learning is of particular importance for women due to various social, cultural, and economic factors. Lifelong learning is especially important for women due to factors such as empowerment, career advancement, breaking gender stereotypes, work-life balance, health and well-being, social participation, intergenerational impact, and overcoming barriers. By investing in women's education, skills development, and lifelong learning initiatives, societies can unlock their full potential and move towards a more equitable and prosperous future for all. Today, technology has had a profound impact on lifelong learning, transforming the way individuals access, interact with and benefit from educational opportunities throughout their lives. The main effects of technology on lifelong learning vary as accessibility, flexibility, various learning methods, personalization, collaboration and networking, continuous learning, cost-effectiveness, and global access. The main purpose of the article is to investigate the role of technology in the lifelong learning of women in Azerbaijan. The article analyzed data gathered in 2023 using Analysis of Variance to assess the influence of technology on women's lifelong learning. The findings obtained aim to address current challenges and enhance the effectiveness of lifelong learning through improved utilization of technology.

Keywords: *Lifelong Learning, Technology, Education, Skill Development*

E-commerce platforms in Albania, Cases of Success

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ABSTRACT

This paper analysis the digitalization of the Albanian economy by focusing on the e-commerce platforms and their impact in the overall economic development. Its aim is to examine the current state of Albania in the adoption of these new trends in order to identify the potential it has for future development and continuous involvement in the digitalization process. It starts with an overview of the Albanian economy and its digital transformation, how it adopted the e-commerce and why it is important to analyse the e-commerce platforms in Albania. Specific cases studies are taken into analysis to show the importance of e-commerce in our country, the way how they have adopted the new technology, the response of the customers toward these changes and the potential for success. A statistical approach examines the adoption rates of e-commerce in Albania, the main players in this market and their respective market share, as well as the consumers' preferences and behaviour in response to these players' initiatives. It also includes an overview on the governmental awareness and its initiatives to support this glowing economy adopted by some innovative entrepreneurs who are not only following the trends, rather being leaders of the future. As a result, this paper provides insights for policymakers about the challenges and opportunities of e-commerce, makes the new entrepreneurs aware of the potential that Albania has in this developing area, and convinces the investors on the power of digitalization to provide positive required returns. In conclusion this research highlights the growth of e-commerce in Albania, the importance of the steps that the government has taken to support this development, and the importance of innovation, customer relation and involvement in enhancing the profitability of the businesses and the overall economic development. Some important recommendations would be the investment in developing infrastructure, the update of the regulatory framework, and the promoting of transparency, security and trust in the activity of e-commerce.

Keywords: *Digital Economy, E-commerce, Market analysis, Consumer behaviour, Government policies*

The Transformation of Teaching and Learning English: An Exploratory Study of Innovative Trends in Teaching and Learning English for Specific Purposes

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ABSTRACT

In recent years, the world of English education has seen remarkable shifts, primarily driven by the emergence of cutting-edge technologies and the pressing demand for adaptable and dynamic learning environments. Today's educators can effortlessly embrace advanced educational tools, ranging from computers and tablets to smartphones. In addition, the introduction of digital resources, like online quizzes and instructional videos, has provided educators with the tools to accurately evaluate the progress of the students. These resources have significantly transformed how students interact with the course content. Tools are interactive and engaging, tailored to individual needs, making the learning experience richer and more dynamic. Beyond traditional textbooks, technology has opened doors to a wealth of data that students can explore and learn at their own pace. Moreover, educators can now efficiently track students' progress and provide personalized feedback, elevating the overall quality of learning. The goal of this study is to investigate the influence of technology on the teaching and learning of English. It attempts to recognize the changes brought about by technology in developing more flexible and dynamic learning environments. It also explores the usefulness of specialized language learning materials, such as podcasts and webinars, in engaging students and improving their English language skills. The integration of technology has opened doors to personalized learning, allowing students to progress at their pace and learning styles. In general, these technological tools have revolutionized the educational system, empowering both educators and students to prosper in an ever-evolving digital age.

Keywords: *Technology, Learning Environment, Teaching Environment, Revolutionizing the Educational System*

Software Project Scheduling and Staffing

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ABSTRACT

Modern IT projects are increasingly dependent on the human factor in determining their quality. A successful outcome depends on the right person performing the right task and the right allocation of human resources within the software project team. This often requires critical thinking, regular team meetings and discussions. With limited project schedules, a software project manager typically needs to be extremely experienced with the team in order to successfully accomplish this task. In this context, this work was conducted within a leading company of software development. The goal is to develop an intelligent tool for managing tasks dedicated to software development teams.

In a dynamic environment and with a large team with different skills, availability and experience, project management is more challenging. In this type of environment, developer selection and resource planning are complicated. Moreover, in a largescale project, the choice of developer is important if the project is to be completed on time. This work addresses the task allocation and scheduling problem while taking into account several real-life constraints. The problem was solved by tailoring an evolutionary algorithm. Precisely, a genetic algorithm was developed and implemented. Assigning tasks to team members was accomplished through the use of historical data from the company's repository or external sources. In order to build the predictive model, the first step was to extract, clean and delete unwanted data. Then, the data was sorted according to skill and performance, and performance was estimated by comparing the estimated work to the work done on the task. A friendly-user graphical interface has also been developed to visualize outputs.

Thus, an effective task management tool was developed in this study that dynamically allocates tasks based on the skills and previous work of the team members to the members of the software development team.

Keywords: *Project management, IT Project Scheduling, Task Allocation, Evolutionary Algorithm*

Design and Construction of Mobile Robot for Disposal of Hazardous Materials

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ABSTRACT

In this paper, a mobile robot prototype has been developed that in the future could serve people to remotely control and remove various hazardous and non-explosive materials. The project has been developed with low cost, indicating that in the future it is not necessarily required to have very large investments to create a mobile device for demining or just for "pick and place". The mobile platform has a robotic arm that can move accurately through hazardous areas to remove non-explosive materials. Additionally, this mobile device can overcome most obstacles encountered on the road, some of them even by passing over them. This project integrates a GPS that informs us at all times about its precise location. It also has two cameras that provide images of the terrain condition at any time. It is controlled by two Remote Controllers, one of which controls the robotic arm, while the other controls the robotic platform. The purpose of the robotic arm is the "pick and place" function. This robotic arm has five degrees of freedom and consists of servomotors with different power, each of which has a unique ID. The microcontroller used for this robotic arm is the CM-700. The robotic arm is controlled by a remote controller RC-100A, which continuously sends signals to the arm controller. The mobile robot structure is entirely made of metal because it is supposed to operate in tough and wet terrains.

Keywords: *Mobile Robot, Manipulator; Demining, Remote Control*

Mobile Application Development in the Era of Cloud Computing

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ABSTRACT

Cloud computing provides computer services over the internet, including servers, storage, databases, networking, software, and intelligence, to enable faster innovation and more flexible resources. Modern technologies allow us to utilize numerous tools and platforms to simplify our work tasks greatly. Cloud computing is one of them. In the fast-evolving environment of mobile technology, cloud computing integration has transformed how mobile applications are designed, deployed, and used. This paper explores the cooperation between mobile application development and cloud computing, aiming to highlight the opportunities and challenges presented by this interdependent relationship. This study aims to provide insights into how cloud computing enhances the capabilities and functionalities of mobile applications. Through an analysis of key technologies, development frameworks, and best practices, the methodology adopted in this study investigates the transformative impact of cloud computing on mobile app development. Our analysis's findings highlight the many advantages of cloud computing, including cost-effectiveness, scalability, faster development cycles, enhanced collaboration, and access to cutting-edge services. However, we also acknowledge potential challenges such as vendor lock-in, security concerns, and dependence on internet connectivity. In conclusion, this study provides insights into how cloud computing influences the contemporary mobile application development scene and suggests future research opportunities. Additional data considerations are discussed to understand this evolving field comprehensively.

Keywords: *Cloud computing, Integration, Mobile App, Key Technologies, Research*

A Multi-Method Exploration of Developer Sentiment Towards Java and Kotlin

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ABSTRACT

The Android development landscape is undergoing a significant shift with the rise of Kotlin. While research explores the technical merits of each landuage and a crucial gap exists in understanding developer sentiment towards Java and Kotlin. This sentiment directly influences adoption rates and shapes the future of the Android ecosystem. This study addresses this gap through a multi method exploration. We employ surveys and interviews and and sentiment analysis of online forums to gain a comprehensive understanding of developer preferences and frustrations and and motivations regarding Java and Kotlin. Our novel approach goes beyond traditional adoption rate studies. We identify key themes influencing developer sentiment and such as perceived ease of use and code maintainability and and community support. We analyze the trade offs developers face when choosing between these landuages. This research contributes valuable insights for researchers and landuage designers and and the Android development community. By understanding developer sentiment and we can make recommendations for improving developer experience and fostering smoother migration paths and and promoting the healthy evolution of the Android development ecosystem.

Keywords: *Java, Kotlin, Developer Sentiment, Multi Method Exploration, Trade-offs Java & Kotlin, Developer Experience; Android Development Community*

Do Artificial Intelligence Help Students to Learn More or Less? Case Study with the Students of SEEU

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ABSTRACT

Artificial intelligence has become topic number one in recent times, and the development of technology is no less talked in Macedonia, especially in academic circles, like universities, secondary schools and other educational institutions. So, like for many countries and places, the development of artificial intelligence releases up new options for students of Southeast European University too. For some this is terrible, and for others it is normal and necessary. We asked young people for their opinion on how the development of technology will affect them, and also from some experts, IT teachers - how to get the most out of it. Both students and teachers happily responded and took part in this conversation. Therefore, in this paper, I'll highlight and present their comments regarding Chat GPT. The focus of the paper is to measure the popularity of Chat GPT among students and their views on its use during their academic engagements. Generally, students' opinions varied widely, some found it useful for generating ideas and getting information, and some expressed concerns about accuracy of information and potential biases in responses. However, it is worth noting that opinions can change over time and students' experiences may differ. So, in this paper we will specifically present students' perspectives on artificial intelligence in our educational settings. The most recent and specific feedback from students and some teachers will be explored in order to come up with some real time perspectives in the use of Chat GPT in our teaching at SEEU. Students' general trends will be observed and discussed with them on the use of artificial intelligence for the benefit of their own learning.

Keywords: *Chat GPT, Educational institutions, Conversation, Students of SEEU*

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