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Book of Abstracts



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Social Media Addiction

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Keywords: Social media addiction · Scale development · Validity · Reliability

This research digs into why people get hooked on social media, trying to understand how it affects our behavior, feelings, and society. Using surveys and talks with people, we want to find out why some folks use social media too much and how it might impact their happiness. We'll explore things like comparing ourselves to others online and the fear of missing out. The goal is to learn more about social media addiction so we can help people use it in a healthier way and feel better about their online lives.

References:

Tutgun-Ünal, A., & Deniz, L. (2015). Development of the social media addiction scale. AJIT-e: Academic Journal of Information Technology, 6(21), 51-70.

Production of Single-use Plastic Waste

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Keywords: Single-use plastics · Plastic Waste · Pollution

Ever since the advent of plastic as a versatile, cheap and durable material, humanity has been plagued by its consequences in the form of plastic waste – non-biodegradable and producing toxic side-products when forcibly degraded through combustion or the like. The outcome of this has since become the mass plastic pollution that is dispersed throughout the planet, with no indication of decline. Possibly the biggest contributors to this forthcoming disaster are single-use plastics, as they tend to end up being discarded and are seldom recycled. The aim of this study is to assess the production of single-use plastic waste and its impact on the ever-increasing levels of plastic pollution. We hope that results of our research will successfully demonstrate the negative effects of humanity's mass usage of single-use plastics.

References:

Dey, A., Dhumal, C. V., Sengupta, P., Kumar, A., Pramanik, N. K., & Alam, T. (2021). Challenges and possible solutions to mitigate the problems of single-use plastics used for packaging food items: A review. Journal of Food Science and Technology, 58(9), 3251-3269.

Increased Screen Time and Its Danger

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Keywords: Screen time · Mobile mindfullness

Phones are taking over the world and free time of students. Various studies show that students' screen time is longer than their sleep time. Our research aims to collect data from Vilnius University students and measure the severity of this problem among them. After the data is collected, this study will look for ways to reduce students' phone time using screen time trackers and raise their mobile mindfullness. Data will be collected through surveys and analyzed. Many screen time trackers will be tested and the best of them will be offered to people as a means of liberation from telephone addiction.

References:

Christensen, M. A., Bettencourt, L., Kaye, L., Moturu, S. T., Nguyen, K. T. (2016). Direct measurements of smartphone screen-time: relationships with demographics and sleep. PloS one, 11(11), e0165331.

K. Kaye, L., Orben, A., A. Ellis, D., C. Hunter, S., & Houghton, S. (2020). The conceptual and methodological mayhem of "screen time". International Journal of Environmental Research and Public Health, 17(10), 3661.

Oeldorf-Hirsch, A., & Chen, Y. (2022). Mobile mindfulness: Predictors of mobile screen time tracking. Computers in Human Behavior, 129, 107170.

Tomczyk, Ł., & Lizde, E. S. (2023). Is real screen time a determinant of problematic smartphone and social network use among young people?. Telematics and Informatics, 101994.

Society's Perception of the Effects of Technology on Children

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Keywords: Screen time · Attention span · Problem-solving skills

Being young and impressionable while simultaneously having access to the internet can be a beneficial thing for their development, but at the same time having so much information, good and bad, in one place could become counterintuitive. This project aims to identify how different backgrounds such as age, family status and beliefs affect a person's perception of the significance of utilizing technology from an early age. Qualitative data will be collected from interviews of different people encountered in the center of Vilnius. This information will be grouped and analyzed based on the aforementioned background factors. Moreover, existing research in terms of research articles will be used to determine whether people are adequately knowledgeable about the given topic.

References:

Gottschalk, F. (2019). Impacts of technology use on children: Exploring literature on the brain, cognition, and well-being.

Telmesani, M., Ahmad, W., & Telmesani, T. M. (2017). The impact of technology on minors: a surveybased study. Australasian Journal of Business, Social Science, and Information Technology, 3(2), 78-90.

The Rise of Deepfakes and Their Effects on Politics

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Keywords: Deepfakes · Politics · Disinformation · Artificial Intelligence

Burgeoning rise of artificial intelligence poses various threats such as the influence of deepfakes. Advanced synthetic media could be used to spread disinformation and blackmail politicians. This project aims at analysing respondents' abilities to identify deepfakes. The study contains a survey, where questions with voice samples are presented to interviewees for distinction. This quantitative data will be used to indicate respondents' abilities to distinguish deepfakes according to their age, gender, education and self-confidence. As the concept of deepfakes is relatively new, it is expected that interviewees would have difficulties differentiating deepfakes from real voices. The objective of our study lies in its potential to inform politicians, educate the public and develop safety measures to mitigate the risks posed by deepfakes.

References:

Appel, M., & Prietzel, F. (2022). The detection of political deepfakes. Journal of Computer-Mediated Communication, 27(4), zmac008.

Dobber, T., Metoui, N., Trilling, D., Helberger, N., & de Vreese, C. (2021). Do (microtargeted) deepfakes have real effects on political attitudes?. The International Journal of Press/Politics, 26(1), 69-91.Hameleers, M., van der Meer, T. G., & Dobber, T. (2023). They Would Never Say Anything Like This! Reasons To Doubt Political Deepfakes. European Journal of Communication, 02673231231184703.

Human-AI Collaboration Leads to Higher Quality Art

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Keywords: Generative AI · Art · Human-AI Collaboration

Recent developments in AI generative technologies have sparked a division between artists. While some embrace breakthrough AI and recognize its value, others are cautious with some being concerned about their future. Our research delves into the subject of human-AI art generation. The primary objective is to challenge prevalent apprehensions among artists about AI by demonstrating its potential as an enriching creative tool. Employing a survey methodology, the researchers present six drawings - three generated by AI and the rest enhanced by human touch. The study will give insights into the perceived visual quality arising from human-AI collaboration in art creation. While existing research has explored AI's impact on fields like poetry and game development, this research aims to provide an understanding of how such collaboration applies to traditional visual art. The researchers' goal is to present compelling findings that could show the value of AI-human collaboration, thus changing the current AI usage in arts status quo.

References:

Hitsuwari, J., Ueda, Y., Yun, W., & Nomura, M. (2023). Does human–AI collaboration lead to more creative art? Aesthetic evaluation of human-made and AI-generated haiku poetry. Computers in Human Behavior, 139, 107502.

Serpa, Y. R., & Rodrigues, M. A. F. (2022). Human and machine collaboration for painting game assetswith deep learning. Entertainment Computing, 43, 100497.

Applications of AI in Diagnosis of Skin Cancer: A Comparison to Real Professionals

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Keywords: Machine Learning \cdot Artificial Intelligence \cdot Skin Cancer Diagnosis \cdot Specificity \cdot Sensitivity

This study investigates the role of artificial intelligence in skin cancer diagnosis, comparing it with traditional medical expertise. Combining recent studies, the study evaluates AI's efficacy in skin cancer diagnosis, providing insights into its potential as a diagnostic tool and its limitations in comparison to human judgment. Key studies explore AI's practicality, accuracy, and collaborative potential, with a focus on sensitivity, specificity, and overall diagnostic accuracy. The results highlight AI's proficiency in identifying skin cancer, especially in sensitivity, yet underscore challenges in specificity. The discussion emphasizes the importance of diverse training data and proposes a collaborative diagnostic model. The research reveals AI's promising role in skin cancer diagnosis, advocating careful integration with human expertise.

References:

Investigating Learning: as a Skill and as an Ability

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Keywords: Lifelong learning · Knack for learning · Information · Students · Academic achievements

Lifelong learning is an integral part of the human experience. This is especially true in the age of computers, where all available information on everything is available online and is often free of charge. This project aims to identify if studying in the modern age has more to do with a person's knack for learning or if it is more important to approach it as a discipline and something to be mastered. Information will be obtained via anonymous online surveys from both high school and university students. Moreover, existing research articles will be examined to gather more information. We will analyze the likelihood for those enthusiastic about learning to reach better academic achievements when compared to the average pupil. We hypothesize that students which have an innate ability for academics will outperform those who don't. This research will allow people to better understand their relationship with learning and improve it.

References:

Amal Alhadabi & Aryn C. Karpinski (2020) Grit, self-efficacy, achievement orientation goals, and academic performance in University students, International Journal of Adolescence and Youth, 25:1, 519-535.

Malacapay, M. C. (2019). Differentiated Instruction in Relation to Pupils' Learning Style. International Journal of Instruction, 12(4), 625-638.

Tekkol, İ. A., & Demirel, M. (2018). An investigation of self-directed learning skills of undergraduate students. Frontiers in Psychology, 9.

To What Extent is Eurovision a Political Contest

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Keywords: Eurovision Song Contest- Voting Patterns- Political Contest- International Relations

Eurovision song contest is one of the most popular international events with a big cultural and economic impact as well as a platform with political implications. This project aims to identify to what extent is Eurovision a political contest and analyzing political aspect of this widely watched contest is relevant today as it helps us understand political tensions and impact of global events nowadays. Information about politics involvement and impact of it is obtained from the survey of Eurovision viewers. The expected result of the survey is that even though majority of viewers still prioritize musical aspects, it is not uncommon for countries to exhibit voting patterns influenced by political relationships and it can impact how some individuals perceive the contest. Analyzing Political aspects in Eurovision draws attention to global issues, increasing awareness and encouraging discussions among viewers.

References:

Charron, N. (2013). Impartiality, friendship-networks and voting behavior: Evidence frovoting patterns in the Eurovision Song Contest. Social Networks, 35(3), 484-497.

Contest. Physica A: Statistical Mechanics and its Applications, 360(2), 576-598 cultural?. European Journal of Political Economy, 24(1), 41-52.

Fenn, D., Suleman, O., Efstathiou, J., & amp; Johnson, N. F. (2006). How does Europe make its Ginsburgh, V., & amp; Noury, A. G. (2008). The Eurovision song contest. Is voting political or mind up? Connections, cliques, and compatibility between countries in the Eurovision Song

Improving Public Transport to Increase Its Efficiency and Usage in Vilnius

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Keywords: Public transport · Micro-mobility · Service quality · Infrastructure

Public transportation (PT) can be a safe and effective way for people to get to work, public healthcare facilities, and schools, although its market share is declining. It is also one of the best ways to help the environment in an age where vehicle usage and their emissions keeps increasing. While research has already explored the potential for enhancing PT by integrating its various components and addressing financial aspects, this paper aims to emphasize strategies specifically focused on improving its efficiency in Vilnius. We have conducted a survey and used research articles to collect our data. The data will be analyzed by visualization and statistical methods where necessary. Collected data shows that half of Vilnius university students use public transport daily. People are happy with the public transport infrastructure even though most say that sometimes public transport is late and lacks airconditioning. The results of this research would provide insights into the most fitting and cost-effective options for making public transport more accessible and comfortable to use.

References:

Liu, T., Ceder, A., & Chowdhury, S. (2017). Integrated public transport timetable synchronization with vehicle scheduling. Transport metrica A: Transport Science, 13(10), 932-954.

Oeschger, G., Carroll, P., & Caulfield, B. (2020). Micromobility and public transportintegration: The current state of knowledge. Transportation Research Part D: Transport and Environment, 89, 102628

Poliak, M., Poliakova, A., Mrnikova, M., Šimurková, P., Jaśkiewicz, M., & Jurecki, R. (2017). The competitiveness of public transport. Journal of Competitiveness.

Practicality of Different CAPTCHA Types

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Keywords: CAPTCHA \cdot Artificial Intelligence \cdot User-Friendliness \cdot Efficiency \cdot Online Security \cdot Evolving Technology

In the rapidly evolving age of AI, it's crucial to improve methods for distinguishing between humans and bots. Currently, CAPTCHA is the most trusted method for this task. Our project aims to explore the efficiency and user-friendliness of countermeasures introduced to stay ahead of the AI curve. We assess the ease, difficulty, and time required by users to successfully complete CAPTCHA tests through a web-based experiment with five different test types, collecting valuable user data. By evaluating this data, we seek to enhance the effectiveness and user-friendliness of current anti-bot measures. Our research could help ensure a more seamless and user-friendly online experience for everyday users in the ever-evolving landscape of AI technology.

References:

Fanelle, V., Karimi, S., Shah, A., Subramanian, B., & Das, S. (2020). Blind and human: Exploring moreusable audio {CAPTCHA} designs. In Sixteenth Symposium on Usable Privacy and Security(SOUPS 2020) (pp. 111-125).

Gutub, A., & Kheshaifaty, N. (2023). Practicality analysis of utilizing text-based CAPTCHA vs. graphicbased CAPTCHA authentication. Multimedia Tools and Applications, 1-33.

Xu, X., Liu, L., & Li, B. (2020). A survey of CAPTCHA technologies to distinguish between human and computer. Neurocomputing, 408, 292-307.

The Impact of Diet on Academic Performance

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Keywords: Academic Performance · Cognitive Performance · Diet · Nutrition, STEM

Scientific discoveries of the 20th century have influenced society to focus more on wellness than ever before: the fundamentals of nutrition are taught in schools and countless commercial food establishments have implemented healthy options. However, in this field of research and in the general awareness of nutrition, many gaps remain. Recent findings suggest a correlation between blood sugar levels and day-to- day cognitive performance, while certain diets may be linked to cognitive decline later in life, but more research must be done. Therefore, this study aims to explore the diet habits and academic performance of Lithuanian STEM students through surveys and the analysis of contemporary scientific research. A deep understanding of the nutrition of students in a particularly challenging field could lead to optimization of the academic process, further inquiries into food's effects on cognitive functioning, and changes to policy surrounding food.

References:

Liu, Z., Zaid, M., Hisamatsu, T., Tanaka, S., Fujiyoshi, A., Miyagawa, et al. (2020). Elevated fasting blood glucose levels are associated with lower cognitive function, with a threshold in non-diabetic individuals: A population-based study. Journal of epidemiology, 30(3), 121-127.

Puri, S., Shaheen, M., & Grover, B. (2023). Nutrition and cognitive health: A life course approach. Frontiers in public health, 11, 1023907.

Impact of Technology on Education

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Keywords: Education · Technology

The appearance of technology in our daily lives is growing. Nowadays even in university there are almost no students who don't use technology. This project aims to show the impact that modern technology has on education. To analyse this case from various students, data was collected from VU students by issuing a survey. The findings of the survey revealed that most students prefer technology in their education rather than traditional learning. This research could help teachers and students reach a common understanding of technology use in education and better the education process.

References: Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. Journal of Applied and Advanced Research, 3(1), 33-35.

Exploring the Integration of AI Tools in Lithuanian Schools: a Qualitative Study on Teachers Perspectives

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Keywords: AI · Technology

This research investigates the extent to which AI tools are utilized by Lithuanian teachers, specifically it focuses on the perspective of the teachers themselves and their opinion of the usage of such tools. Through the use of qualitative data gathered via interviews, the research aims to uncover the extent to which educators leverage AI capabilities in the classroom. Right now, AI is one of the world's cutting-edge technologies and it plays a big role in shaping the educational landscape globally. Understanding its adoption in Lithuanian schools could provide crucial information for informed policy making and technology development. Secondly, the findings could shed light on potential challenges and opportunities on AI integration in the education sphere, as a result affecting the quality of teaching in Lithuania.

References:

Calatayud, V. G., Espinosa, M. P. P., & amp; Vila, R. R. (2021). Artificial Intelligence forStudent Assessment: A Systematic review. Applied Sciences, 11(12), 5467.

Huang, J., Saleh, S., & amp; Liu, Y. (2021). A review on Artificial intelligence in education. Academic Journal of Interdisciplinary Studies, 10(3), 206.

How AI Affects Learning Process

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Keywords: Artificial Intelligence (AI) · Education System Impact · AI Integration

This study explores how AI tools could revolutionize education by examining their impact on the learning process. Emphasizing the relevance of this idea, the research investigates how advanced technologies influence teaching and learning dynamics. Envisioning a future where AI reshapes educational systems, the study utilizes experimental data collection. Two teams performed a task, one using AI tools and the other not, to discern effects on learning outcomes. Following the chosen methodology, the research aims to reveal practical implications and drawbacks of AI integration in education. Results indicate that students using AI tools achieve faster results but may forget learned content within a few days, highlighting potential benefits and challenges in incorporating AI into education.

References:

Aithal, P. S.; Aithal, S., (2023). The Changing Role of Higher Education in the Era of AI-based GPTs. International Journal of Case Studies in Business, IT, and Education (IJCSBE), 7(2), 183-197.

Aktay S., Gök S., Uzunoğlu D. (2023), ChatGPT in Education, 7(2), 378-406

Mhlanga D. (2023). The Value of Open AI and Chat GPT for the Current LearningEnvironments and The Potential Future Uses

The Divergent Views of Hacktivism in Sources of Media and Vilnius University Students

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Keywords: Hacktivism \cdot Social change \cdot Digital rights \cdot Divergent viewpoints

Hacktivism is becoming an ever-more-relevant topic in the light of recent political events. This study examines the divergent views of hacktivism between Vilnius University students and a range of various sources of media. A questionnaire was used to collect data about the students using a 5-point Likert scale. A second dataset was derived from transcripts of various media sources. Terminology analysis will be carried out by comparing any correlations between these two sets of data, with expected results indicating that the students' views reflect those expressed in the media. Understanding the ethical dynamics of hacktivism is in particular beneficial to students of the Mathematics and Informatics faculty, as they are the most likely to encounter it in their future careers.

References:

Agarawl, N. (2023). EMERGENT DEFINITION OF ONLINE SOCIAL ACTIVISM. International Journal of Development and Conflict, 13(1), 17–38.

Djavaherian, B. (2022). THE THREAT IS STRONGER THAN THE EXECUTION: REALITIES OF HACKTIVISM IN THE 2020'S.

Romagna, M., & Leukfeldt, R. E. (2023). Becoming a hacktivist. examining the motivations and the processes that prompt an individual to engage in hacktivism. Journal of Crime and Justice, 1–19.

The Influence of Video Game Addiction on Academic Performance

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Keywords: Video game addiction · Video games · Emotional state · Gaming disorder

This study investigates the connection between video game addiction and emotional states among Vilnius University students. As part of its methodology, the study will employ an online survey to gather data from Vilnius University students, including both male and female participants, exploring emotional states such as stress, happiness etc. while playing video games. The results will aid education institutions in better understanding the role of video game addiction in academic performance and will encourage policymakers in considering it as a relevant factor in future decision-making.

References:

Esposito, M. R., Serra, N., Guillari, A., Simeone, S., Sarracino, F., Continisio, G. I., & Rea, T. (2020). An investigation into video game addiction in pre-adolescents and adolescents: A cross-sectional study. Medicina, 56(5), 221.

Gros, L., Debue, N., Lete, J., & Van De Leemput, C. (2020). Video game addiction and emotional states: possible confusion between pleasure and happiness?. Frontiers in psychology, 10, 2894.

Nim, A., & Pandey, N. (2020, February). ADDICTION OF VIDEO GAMES AMONG YOUNG ADULTS: AN INTERVENTION. In National Seminar (Vol. 1, p. 1).

Optimisation of Public Transport in Vilnius

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Keywords: Public Transport · Optimisation

Public transport benefits us in many aspects, ranging from more convenient commuting to ecological advantages. Thus, its optimisation is very relevant to everyone and even more so to us, university students, who use it on a daily basis. This project will evaluate various options for optimisation of public transport in Vilnius. The foundation of our project is a few potential optimisation methods suggested by research articles. This project will further analyse and assess these methods. In order for them to be assessed, data will be gathered from surveys answered by Vilnius University students. After the acquisition of processed data, plausible ways of change implementation will be concluded and presented. The project's discoveries stand to directly improve the lives of Vilnius residents, potentially making public transport quicker, more convenient, and considerably more efficient, resulting in increased utilisation and, consequently, reduced personal car traffic jams.

References:

Busch-Geertsema, A., Lanzendorf, M., & Klinner, N. (2021). Making public transport irresistible? The introduction of a free public transport ticket for state employees and its effects on mode use. Transport Policy, 106, 249-261.

Gofurjonovich, I. A. (2023). METHODS FOR DETERMINING THE NEED TO USE THE METRO IN TRANSPORT SYSTEMS OF BIG CITIES BY MATHEMATICAL SIMULATION. Spectrum Journal of Innovation, Reforms and Development, 12, 234-240.ISO 690

Ogryzek, M., Adamska-Kmieć, D., & Klimach, A. (2020). Sustainable transport: an efficient transportation network—case study. Sustainability, 12(19), 8274.

Mental Health During Global Crisis

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Keywords: Crisis · Mental Health · Data.

This idea is exceptionally relevant today because of the recent COVID-19 virus which has had a snowball effect starting with the economic problems which lead to mental health problems on a global scale. We have collected data via a survey and doing research online. The survey and research showed us that the recent global crisis affected people's mental health as well as a heightened use of recreational drugs (Alcohol, Tobacco, etc.). During the start of this project, our primary methodology was qualitative, such as research articles which provided us with interpretation from researchers' observations. In the latter half of the project, we incorporated qualitative data in the form of a survey. Our expected results mostly aligned with the data, but the survey showed us that an economic crisis had less of an effect on people's mental health and recreational drug usage. This project's collected data and examples will benefit the world by providing more awareness to the problem at hand.

References:

Elmer, T., Mepham, K., & Stadtfeld, C. (2020). Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. Plos one, 15(7), e0236337.

Jones, E. A., Mitra, A. K., & Bhuiyan, A. R. (2021). Impact of COVID-19 on mental health in adolescents: a systematic review. International journal of environmental research and public health, 18(5), 2470.

Silva, M., Resurrección, D. M., Antunes, A., Frasquilho, D., & Cardoso, G. (2020). Impact of economic crises on mental health care: a systematic review. Epidemiology and psychiatric sciences, 29, e7.

Simonse, O., Van Dijk, W. W., Van Dillen, L. F., & Van Dijk, E. (2022). The role of financial stress in mental health changes during COVID-19. npj Mental Health Research, 1(1), 15.

Wittgens, C., Fischer, M. M., Buspavanich, P., Theobald, S., Schweizer, K., & Trautmann, S. (2022). Mental health in people with minority sexual orientations: A meta-analysis of population-based studies. ActaPsychiatrica Scandinavica, 145(4), 357-372.

The Evolution of Healthcare: Investigating How AI Is Revolutionizing Medicine and Shaping Public Perception

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Keywords: Artificial Intelligence (AI) in Healthcare · Ethical AI Implementation · Public

Awareness and Acceptance

This study delves into public perceptions of the integration of Artificial Intelligence (AI) into healthcare. It explores prevailing opinions and factors influencing diverse perspectives on AI in healthcare. The research identifies concerns such as accuracy, ethics, job displacement, and privacy among respondents, despite recognition of potential benefits. To enhance public awareness and acceptance, the study recommends addressing these concerns, emphasizing collaborative potential, and engaging in public education initiatives. Policymakers and healthcare providers are urged to prioritize ethical and transparent AI implementations, ensuring alignment with public expectations. This research aims to guide the inevitable integration of AI into healthcare toward a system that reflects societal values.

References:

Reddy, S., Fox, J., & Purohit, M. P. (2018). Artificial intelligence enabled healthcare delivery. Journal of the Royal Society of Medicine, 112(1), 22–28.

Usability of AI Programming Assistants

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Keywords: AI programming assistants · Artificial Intelligence · Software engineering

The recent developments in AI technologies made AI programming assistants possible, for example, GitHub Copilot and ChatGPT. Since the technology is new and recent this creates several questions related to the usability of these tools. In this research we try to answer those questions by asking programmers themselves what they think of these tools, also we will analyze previously completed research to make our results more accurate. We will try to understand what motivates programmers to use these tools and we will also try to find what these tools lack. This data will be collected with a survey where programmers will be asked to give their opinions about AI assistants. Also, by analyzing literature, previously written research and our collected data from the survey, we will try to find how accurate these tools are. Our findings are important because they let us understand more about AI technologies which are used in AI programming assistants and how they could be improved.

References:

Liang, J. T., Yang, C., & Myers, B. A. (2023, November). A Large-Scale Survey on the Usability of AI Programming Assistants: Successes and Challenges. In 2024 IEEE/ACM 46th International Conference on Software Engineering (ICSE) (pp. 605-617). IEEE Computer Society.

Liu, J., Tang, X., Li, L., Chen, P., & Liu, Y. (2023). Which is a better programming assistant? A comparative study between chatgpt and stack overflow. arXiv preprint arXiv:2308.13851.

Ma, Q., Wu, T., & Koedinger, K. R. (2023). Is AI the Better Programming Partner. Human-Human Pair Programming vs. Human-AI pAIr Programming. CoRR, abs/2306.05153.

Digital Advertisements and Effectiveness of Different Types of Ads

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Keywords: Digital advertisement · Advertisement effectiveness · Buying behavior · Brand Loyalty

With the constantly changing generations, it is important for companies to modify their advertisements to get the most value. This study aims to analyse, which types of ads are the most appealing, accepted and persuasive to the society, therefore making the most profit. Quantitative data will be collected through a survey among various people from all generations. This will provide up-to-date statistics of effectiveness of different types of ads, which can be immediately implemented by companies to boost their sales.

References:

Hussain, M., Islam, T., & Rehman, S. U. (2023). What you see is what you get: assessing ingameadvertising effectiveness. Journal of Research in Interactive Marketing, 17(4), 527-543

Munsch, A. (2021). Millennial and generation Z digital marketing communication and advertisingeffectiveness: A qualitative exploration. Journal of Global Scholars of Marketing Science, 31(1), 10-29

Zhao, J., Butt, R. S., Murad, M., Mirza, F., & Saleh Al-Faryan, M. A. (2022). Untying the influence ofadvertisements on consumers buying behavior and brand loyalty through brand awareness: themoderating role of perceived quality. Frontiers in Psychology, 12, 803348

Data Breaches and the Hindrances They Cause

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Keywords: Data breaching $\,\cdot\,$ Predictability $\,\cdot\,$ Data mining $\,\cdot\,$ Ignorance $\,\cdot\,$ Data breaching hindrances $\,\cdot\,$ Awareness

This research investigates the pervasive issue of data breaches in the digital era, focusing on prevention methods, causes, and the integration of cybersecurity measures. Drawing from a 2022 study on organizational data breaches, the work underscores the importance of information security-conscious behavior in incident responses. A subsequent study from 2005 to 2018 developed predictive models for estimating the likelihood and size of data breaches in the U.S., emphasizing sector-specific approaches to enhance organizational preparedness. A third research, conducted in 2023, explores changes in cybersecurity risk disclosures following a data breach, highlighting firms' motivations for increased disclosure. The methodology involves surveys among diverse participants, presenting results in a quantitative format to uncover awareness, experiences, and practices related to data breaches and cybersecurity measures. The findings suggest that proactive measures, informed by sector- specific models, can effectively mitigate the risk of unauthorized access and data breaches. Practical implications include enhancing organizational preparation, addressing public scrutiny, and deterring future cyberattacks. This research contributes valuable insights to thefield of cybersecurity, providing a foundation for future studies and practical applications indata breach prevention.

References:

Barati, M., & Yankson, B. (2022). Predicting the occurrence of a data breach. International Journal of Information Management Data Insights, 2(2), 100128. Teoh, A. A., Ghani, N. B. A., Ahmad, M., Jhanjhi,

Chen, J., Henry, E., & Jiang, X. (2023). Is cybersecurity risk factor disclosure informative? Evidence from disclosures following a data breach. Journal of Business Ethics, 187(1), 199-224.

N., Alzain, M. A., & Masud, M. (2022). Organizational Data Breach: Building Conscious Care Behavior in Incident. Organizational data breach: Building conscious care behavior in incident response. Computer Systems Science and Engineering, 40(2), 505-515.

Vehicular Ransomware and Its' Danger to Drivers

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Keywords: Distraction · Traffic Accidents · Touchscreens · Malware · Ransomware

This research investigates the nexus of driver distraction, impaired car touchscreens, and their collective impact on traffic accidents. Utilizing a mixed- methods approach, we analyze accident data and conduct qualitative assessments to understand the challenges posed by impaired touchscreens. The study aims to provide insights into the cognitive and visual demands of touchscreen interactions, their vulnerability to malware, contributing valuable information for policymakers, automakers, and safety advocates. The findings inform the design of user interfaces and regulatory measures to enhance driver safety amidst evolving automotive technologies.

References:C.J. Robbins, Steve Fotios (2022), The prevalence of in-vehicle driving distractions in road traffic collisions as a function of road type, Transportation Research Part F: Traffic Psychology and Behavior, Volume 84, Pages 211-222

Roja Ezzati Amini, Christelle Al Haddad, Debapreet Batabyal, Isidora Gkena, Bart De Vos, Ariane Cuenen, Tom Brijs, Constantinos Antoniou (2023), Driver distraction and in-vehicle interventions: A driving simulator study on visual attention and driving performance, Volume 191, Accident Analysis & amp; Prevention

Leandro Masello, Barry Sheehan, German Castignani, Darren Shannon, Finbarr Murphy (2023), On the impact of advanced driver assistance systems on driving distraction and risky behavior: An empirical analysis of Irish commercial drivers, Volume 183

William Payre (2023), The notorious B.I.T: The effects of a ransomware and a screen failure on distraction in automated driving, Volume 94, Transportation Research Part F: Traffic Psychology and Behavior, Pages 42-52,

Investigating the Impact of Electric Scooter Ban on Urban Road Safety in Vilnius

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Keywords: Road User Safety · Micro Mobility · Electric Scooters · Urban Mobility

Since the pace of life in cities is extremely fast, transportation systems play a crucial role. Electric scooters offer a time-saving solution by allowing users to quickly navigate through the city; however, they also pose certain threats. This study aims to examine how a ban on this type of transportation could affect road user safety in Vilnius. We will gather and analyse data from various major cities related to scooter crashes, pedestrian injuries, fatalities, maximum speed limits, and other limitations. This analysis will enable us to speculate on the safety of pedestrians before and after the ban in the capital city of Lithuania.

References:

Félix, R., Orozco-Fontalvo, M., & Moura, F. (2023). Socio-economic assessment of shared e-scooter riders and pedestrians: Attitudes and interactions in five countries. Heliyon, 9(4).environment, 118, 103714.

Glavić, D., Trpković, A., Milenković, M., & Jevremović, S. (2021). The e-scooter potential to changescooters: do the benefits overcome the externalities?

Šucha, M., Drimlová, E., Rečka, K., Haworth, N., Karlsen, K., Fyhri, A., ... & Slootmans, F. (2023). Urban mobility – Belgrade case study. Sustainability, 13(11), 5948

Public Transportation or E-scooters? Efficiency Algorithm for Commuters in Vilnius

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Keywords: Public Transportation · E-scooters · Efficiency

This study focuses on developing an efficiency algorithm for using public transportation (PT) or escooters, to help the commuters in Vilnius find an individual transport solution. The aspects analyzed were time-efficiency, cost- effectiveness, sustainability, and convenience. Sources like Trafi, Bolt, online maps and existing statistics were utilized during data collection. This research's methodology draws on Sanders et al's (2020) survey on e-scooter usage, Aarhaug et al.'s (2023) examination of e-scooters and PT dynamics, and Mitropoulos et al.'s (2023) review of micro-mobility systems. Together they form a strong foundation for developing our algorithm. The results expected are that PT will be more time and cost-efficient for longer journeys, as well as more environmentally friendly than e-scooters. Also, it is anticipated that e-scooters might be more convenient and time-efficient during short journeys. We propose this algorithm, in hopes that it will help the commuters in Vilnius to save time, money and be more environmentally sustainable, in return benefiting the city as a whole.

References:

Johnsson, E. (2023). E-scooters and public transport – Complement or competition? Research in Transportation Economics, 98, 101279.

Mitropoulos, L., Stavropoulou, E., Tzouras, P., Karolemeas, C., & Kepaptsoglou, K. (2023). E-scooter micromobility systems: Review of attributes and impacts. Transportation research interdisciplinary perspectives, 21, 100888.

Sanders, R., Branion-Calles, M., & Nelson, T. (2020). To scoot or not to scoot: Findings from a recent survey about the benefits and barriers of using E-scooters for riders and non-riders. Transportation Research Part A: Policy and Practice, 139, 217–227.

Mandatory Conscription

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Keywords: Universal Conscription · Public Opinion · National Safety · Military

The current geopolitical climate (the 2014 Russia's invasion into Crimea and the ongoing Ukrainian war) has led many Western countries to reevaluate their military capabilities and defence measures. Lithuania's approach has not only been to raise military spending to the recommended 3% of GDP but also to introduce universal conscription by 2028 - 2030. This project aims to root up the Lithuanian public opinion on the implementation of universal conscription for both men and women. The data will be collected from surveys of different age groups (mainly high school and university students). The findings will be compared, and the statistics will be visually represented, conclusions will be drawn using the SWOT method. The finding of this project could potentially reveal whether the topics of national security and the necessity of having sufficient military power have to be talked about more widely.

References:

Alma Persson & Fia Sundevall (2019) Conscripting women: gender, soldiering, and military service in Sweden 1965–2018, Women's History Review, 28:7, 1039-1056.

KRONSELL, A., & SVEDBERG, E. (2001). The Duty to Protect: Gender in the Swedish Practice of Conscription. Cooperation and Conflict, 36(2), 153-176. Jermalavicius, T. Conscription debate in Lithuania: How to approach the issue. Baltic Defense Review, (8).

Should Electronic Voting Be Implemented in Lithuania?

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Keywords: E-voting · Internet Voting · Political Participation · Turnout

This research explores the possibility of implementing E-voting in Lithuania as a response to the declining voter turnout observed over the past 30 years. The study looks at whether E-voting, which is used in over 20 countries, can make more people participate in politics. Furthermore, it addresses the worries about safety and trust. Data collection involves a survey targeting diverse age groups, recognizing the potential technological challenges faced by older citizens. Comparative analysis with countries like Estonia will help to understand the topic better. The study relies on four research papers, analyzing the impact of E-voting on voter turnout, public trust, and fairness. By addressing these aspects, our research aims to provide valuable insights into the possibility of implementing E- voting in Lithuania.

References:

Farmanullah, A. H. A., Khan, I., Ali, S., & Sharif, S. (2023). ELECTRONIC VOTING SYSTEM AND PUBLIC TRUST: AN ASSESSMENT OF THE VOTERS'PERCEPTION IN DISTRICT PESHAWAR. Journal of Positive School Psychology, 594-605.

Petitpas, A., Jaquet, J. M., & Sciarini, P. (2021). Does E-Voting matter for turnout, and to whom?. Electoral Studies, 71, 102245.

Schneider, R. (2020). Free or Fair Elections? The Introduction of Electronic Voting in Brazil. Economía, 21(1), 73-100.

Shahzad, B., & Crowcroft, J. (2019). Trustworthy electronic voting using adjusted blockchain technology. IEEE Access, 7, 24477-24488.

The Vulnerability of Autonomous Vehicles in Time of World Digitalization and Cyber Attacks

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Keywords: Autonomous vehicles · Vulnerabilities · Cyber-attacks · Prevention methods

Autonomous vehicles or shortly AV's are an up and coming technology that will be used daily in the future. However the general public remains mostly uninformed about the vulnerability of these types of vehicles. This study aims to propose what the public should be informed on and to review how prevalent cybersecurity related accidents actually are. The methodology involves analyzing autonomous vehicle disengagement reports as well as reviewing relevant documents. By studying this data we hope to better understand what difficulties autonomous vehicles might meet in security aspect of it's development as well as find possible prevention methods to shield from cyberattacks.

References:

Taeihagh, A., & Lim, H. S. M. (2019). Governing autonomous vehicles: emerging responses for safety, liability, privacy, cybersecurity, and industry risks. Transport reviews, 39(1), 103-128.

Kim, K., Kim, J. S., Jeong, S., Park, J. H., & Kim, H. K. (2021). Cybersecurity for autonomous vehicles: Review of attacks and defense. Computers & Security, 103, 102150.

Kukkala, V. K., Thiruloga, S. V., & Pasricha, S. (2022). Roadmap for cybersecurity in autonomous vehicles. IEEE Consumer Electronics Magazine, 11(6), 13-23.

Understanding the Prevalence, Impact, and Interventions for Digital Addiction

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Keywords: Digital addiction · Mobile Device Dependency · Physical Health Decline

Internet, video games, mobile devices and online platforms play a critical role in eveyone's lives, but as all good things, they don't come without their own share of issues. As an idiom from the 16th century suggests: " too much of a good thing", even something that may be beneficial, can become harmful through excessive use. This idea is especially relevant when discussing digital addiction because of the current dependence on electronic devices. With the intention of revealing the outline of the benefits, as well as the drawbacks of our digitally connected lives, this research aims to look into topics relating to physical health, social isolation and the decline of academic performence when faced with virtual addiction. In pursuit of relevant data, a live survey will be conducted among university students.

References:

Allcott, H., Gentzkow, M., &Song, L. (2022). Digital addiction. American Economic Review, 112(7), 2424-2463.

Cemiloglu, D., Almourad, M. B., McAlaney, J., & Ali, R. (2022). Combatting digital addiction: Current approaches and future directions. Technology in Society, 68, 101832.

Meng, S. Q., Cheng, J. L., Li, Y. Y., Yang, X. Q., Zheng, J. W., Chang, X. W., ... & Shi, J. (2022). Global prevalence of digital addiction in general population: A systematic review and meta-analysis. Clinical Psychology Review, 92, 102128.

Exploring the Potential of Artificial Intelligence (AI) in Medical Diagnostics and Biomedical Fields

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Keywords: AI · Diagnostics · Biomedical

The goal of medical diagnostics is to make an accurate diagnosis and provide efficient means to treat the patient. While biomedicine has aimed to find fast and accurate answers to user- formulated questions from datasets, documents, and other sources of information. With rising population numbers over the years, pinpointing the problem, which cause malice to the person, has been made harder with the rising number of cases doctors have to take with each wave of disease the human population is stricken with. Artificial intelligence has been developing rapidly in recent times in terms of better algorithms, hardware and have been applied to various field including medicine The application of artificial intelligence (AI) techniques such as Machine learning (ML) and Deep learning (DL) has led to prosperous evaluations that were done automatically and might have the potential to reduce workload while also increasing the accuracy of predictions and detection of various diseases. This review aims to find the existing uses for artificial intelligence in medical diagnostics and make an overall summary of the potential, challenges and limitations that come with using it in medicine related fields.

References:

Youth Perceptions of AI in the Workplace

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Keywords: Artificial intelligence (AI) · Youth perspectives · Workplace impact · AI integration

The recent surge in AI technologies and increased use of AI in the workforce means that it is ever more important to analyse peoples' opinion on AI, since little research has been conducted. Specifically, the opinions of students' are of extreme importance, since they are soon to become part of the workforce and are likely to encounter AI from the beginning of their career. We collected data from students by means of using a public survey to gather both, what we believe to be variables in a person's perception and the view on AI itself. We expect to identify common ideas/concerns in the areas such as job security and skill acquisition. With the results from this analysis, we hope that people and enterprises will be more aware of the opinions of a new worker and that this data will be used in AI development to improve AI as a consumer and a commercial product and for following research to be used as a comparison.

References:

Brauner, P., Hick, A., Philipsen, R., & Ziefle, M. (2023). What does the public think about artificial intelligence?—A criticality map to understand bias in the public perception of AI Frontiers in Computer Science, 5.

Ikkatai, Y., Hartwig, T., Takanashi, N., & Yokoyama, H. M. (2022). Octagon Measurement: Public Attitudes toward AI Ethics. International Journal of Human–Computer Interaction, 38(17), 1–18.

Kelley, P. G., Yang, Y., Heldreth, C., Moessner, C., Sedley, A., Kramm, A., Newman, D. T., & Woodruff,A. (2021). Exciting, Useful, Worrying, Futuristic: Public Perception of Artificial Intelligence in 8 Countries.Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society.

AI Generated and Real-life Human Portraits

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Keywords: Al Images · Deepfakes · Computer Generated Images (CGI) · Internet.

As AI grew, many new technologies emerged that might be dangerous, such as deepfake or AIgenerated images and videos, which, if not handled carefully, could jeopardize the security of regular internet users. The goal of this research is to find out how well can young adults (people aged 18-24), who are mainly familiarized with such websites, distinguish between AI generated and real photos of a person. First of all, the participants were provided with real and AI generated images of people portraits and were asked to separate them. Then a survey was conducted in which the participants were asked to evaluate what helped them differentiate the provided images. Businesses like Facebook, Tinder, and Snapchat may utilize the findings to warn prospective customers about the risks associated with AI generated images.

References:

Bray, S. D., Johnson, S. D., & Kleinberg, B. (2023). Testing human ability to detect 'deepfake'images of human faces. Journal of Cybersecurity, 9(1)

Gamage, D., Ghasiya, P., Bonagiri, V., Whiting, M. E., & Sasahara, K. (2022, April). Are deepfakes concerning? analyzing conversations of deepfakes on reddit and exploring societal implications in proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (pp. 1-19).

Tariq, S., Jeon, S., & Woo, S. S. (2021). Am I a real or fake celebrity? Measurincommercial face recognition web APIS under deepfake impersonation attack.

The Correlation Between Socioeconomic Factors and Mental Health Across Lithuania, Sweden and Germany

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Keywords: Mental Health · Socioeconomic Factors · Cross-country Comparison

This study aims to research the correlation between socioeconomic factors and mental health across Lithuania, Sweden, and Germany. As mental health problems are becoming more relevant in our contemporary society, it is crucial to define what socioeconomic factors determine mental health status to be able to improve it. This study uses quantitative methodology. Mental health and socioeconomic indicators were retrieved from online databases, compared among countries, and the statistical data was represented graphically. It is expected that the worse the socioeconomic situation is, the worse the mental health status in the country is. The findings of this study might encourage people to take mental health into account while making socioeconomic factor improvements.

References:

Guan, N., Guariglia, A., Moore, P., Xu, F., & Al-Janabi, H. (2022). Financial stress and depression in adults: A systematic review. PloS one, 17(2), e0264041.

Kamalulil, E. N., & Panatik, S. A. (2021). Socioeconomic Status and Mental Health among Low-income Employees: A Systematic Literature Review. Pertanika Journal of Social Sciences & Humanities, 29(3).

Li, B., Allebeck, P., Burstöm, B., Danielsson, A. K., Degenhardt, L., Eikemo, T. A., ... & Agardh, E. E. (2023). Educational level and the risk of mental disorders, substance use disorders and self-harm in different age-groups: A cohort study covering 1, 6 million subjects in the Stockholm region. International Journal of Methods in Psychiatric Research, e1964.

Scraping and Analyzing Cybercrime Cases

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Keywords: Cybercrime · Cybersecurity · Cyber attacks · Threat analysis

Cybercrime is a broad and complex field that covers a wide range of criminal activities. This study aims to systematically collect and analyze data on cybercrime cases, categorizing and delving into this information to offer insights aimed at effectively combating cyber threats. Collected data, obtained using quantitative methodology, specifically data scraping, reveals the connection between the types, time and categories of cybercrimes. Algorithms are used to classify and analyze cybercrime patterns. Expected outcomes involve identification of specific types of cyber threats and strategies for preventing digital crimes. This research benefits the world by enhancing cybersecurity measures and providing knowledge of cybercrime offenses in society.

References:

Al-Khater, W. A., Al-Maadeed, S., Ahmed, A. A., Sadiq, A. S., & Khan, M. K. (2020). Comprehensive review of cybercrime detection techniques. IEEE Access, 8, 137293-137311.

Ch, R., Gadekallu, T. R., Abidi, M. H., & Al-Ahmari, A. (2020). Computational system to classify cyber crime offenses using machine learning. Sustainability, 12(10), 4087.

Data Leaks in Apps and Websites

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Keywords: Data breaches · Data leak · Data brokers · Cyber-security firms

Through out the years people all around the world have found ways to benefit from all kinds of information. Nowadays the most common way for a data broker to collect data without anyones notice is to perform a data breach. This study explored whether the amount of information the user has to input is correlated between the probability of a data leak. Information will be abtained by investigating different apps and websites, going undercover as new users and graphing the amount of data that is asked to provide. It is expected to find paralels between data breaches and information collection. With such findings, hopefully, cyber-security firms can find a way or even predict when the next data breach will occur in the future, moreover it is necessary for regular people to understand and choose wisely which apps or websites to use.

References:

Acar, G., Englehardt, S., & Narayanan, A. (2020). No boundaries: data exfiltration by third partiesembedded on web pages. Proceedings on Privacy Enhancing Technologies, 2020(4), 220-238.

Hammouchi, H., Cherqi, O., Mezzour, G., Ghogho, M., & El Koutbi, M. (2019). Digging deeper into data breaches: An exploratory data analysis of hacking breaches over time. Procedia Computer Science, 151, 1004-1009.

Best ETA out of the Most Popular GPS Apps

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Keywords: GPS apps $\,\cdot\,$ Computer estimation $\,\cdot\,$ Traffic

This study aims to explore how good has computer estimation gotten. ETA (Estimated Time of Arrival) is the most frequently used computer estimation device which lets a GPS app calculate the time which is needed for a certain journey. The research methodology involves conducting multiple experiments while driving and noting down the times that the apps provide and the actual times of the experiments. By analysing the collected data this study seeks to determine the greatest GPS app. Not only will the findings of this study reveal how precise are the computer estimations, which will help improve them, but also give people a definitive answer on which GPS app they should use if they seek the most precise arrival prediction.

References:

Austin Derrow-Pinion, Jennifer She (2021). ETA Prediction with Graph Neural Networks in Google Maps. Virtual Event, QLD, Australia.

Noureen ZafarID, Irfan UI Haq (2020). Traffic congestion prediction based on Estimated Time of Arrival. Pakistan Institute of Engineering and Applied Sciences, Islamabad, Pakistan.

Cyber Security Awareness Amongst Computer Science Students

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Keywords: Cyber security · Online privacy · Students · Protective measures

For the past two decades, the amount of cyber crimes worldwide has been increasing exponentially. This study investigates the differences in Cyber Security and Online Privacy proficiency between computer science students of Vilnius University and other international Universities. The data for this research will be gathered utilizing a survey issued to students of Vilnius University and students of foreign Universities, consisting of 20 questions made to assess their skills and understanding of the subject. The data will be analyzed using quantitative methodology. Survey responses will be split between Vilnius University students and students overseas in order to compare the responses between the two groups. It is expected that the results from both sides will be similar. The study findings aim to uncover the difference in the quality of computer science education between Vilnius University and other higher learning institutions, hopefully offering points of improvement for both.

References:

A., Muheidat, F., Tawalbeh, M., & Quwaider, M. (2020). IoT Privacy and security: Challenges and solutions. Applied Sciences, 10(12), 4102.

Pattnaik, N., Li, S., & Nurse, J. R. (2023). Perspectives of non-expert users on cyber security and privacy: An analysis of online discussions on twitter. Computers & Security, 125, 103008. Tawalbeh, L.

Raju, R., Abd Rahman, N. H., & Ahmad, A. (2022). Cyber Security Awareness in Using Digital Platforms among Students in a Higher Learning Institution. Asian Journal of University Education, 18(3), 756-766.

Data Privacy in the Age of IoT

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Keywords: IoT (Internet of Things) · Data privacy · Home Automation · Privacy Concerns

As home automation advanced, concerns about the potential endangerment of users' privacy were raised. Devices described as IoT are especially threatening due to their ability to connect to servers operated by their manufacturers. The main goal of this research is to determine how many of these concerns are valid. The data will be collected by analysing the terms of use agreements for IoT devices marketed for home use. The focus is specifically on what data can be recorded, processed and accessed by the manufacturer. This data should be enough to get an overview of the potential privacy threats and make conclusions about the subset of manufacturers who utilise IoT technology.

References:

Hamed HaddadPajouh, Ali Dehghantanha, Reza M. Parizi, Mohammed Aledhari, Hadis Karimipour (2021) survey on Internet of Things security: Requirements, challenges, and solutions

Lo'ai Tawalbeh, Fadi Muheidat, Mais Tawalbeh, and Muhannad Quwaider (2020) IoT Privacy and Security: Challenges and Solutions.

Nadine Guhr, Oliver Werth, Philip Peter Hermann Blacha & Michael H. Breitner (2020) Privacy concerns in the smart home context.

Online Learning Efficiency

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Keywords: Online learning

In an era marked by technological advancements, Online learning is like bringing your classroom to your home. This way, you can learn at your own pace and fit your classes into your schedule. However, it is not always so beneficial because contextual restrictions, such as power outages, bad internet, a lack of a private place and administrative problems, make it difficult to access, and connect during learning sessions. This study aims to compare online learning to a traditional way to uncover the balance between its benefits and flaws. The research data will consist of a live survey, which will be further used to acquire an answer to an ultimate question – what learning is the most efficient? Additionally, this information will be compared to previous research findings for accurate results. In conclusion, understanding online learning's benefits and flaws, coupled with the analysis of research articles and the insights gained from a live survey among university students, provides a comprehensive understanding of this controversial topic.

References:

Mohammad, R. F., & Kamran, M. (2023). Examining the efficacy of online learning in nurturing students& learning: an analysis of students' experiences. Asian Association of Open Universities Journal.

Tantog, Alfer & amp; Sudaria, Ellin & amp; Eslawan, Rose & amp; Toma, Amana. (2023). Students' Learning Efficacy in Mathematics in an Online and Modular Mode of Learning. 10. 44-55.

Tiwari, Vinita & Tiwari, Abhay. (2021). A study of effectiveness of online learning. Effectiveness of online learning

Free Speech in Educational Institutions

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Keywords: Free speech · Educational institutions · Censorship

Freedom of speech - the power or right to express one's opinions without censorship, restraint, or legal penalty. It is more important now than ever. This study aims to find out if students at university and college of Lithuania feel like they have the right to freedom of speech on campus, how tolerable are different viewpoints and then compare to a foreign university. We plan to accumulate our data with the help of a survey with various questions relating to this topic, gather foreign data by analyzing related articles. Since freedom of speech is so important, our expectations are to find that people feel like they have this right and can express themselves freely, and people tolerate diverse viewpoints. If our expectations are incorrect, with such findings institutions will be informed and, hopefully, act accordingly.

References:

The Impact of Time Management on Academic Performance

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Keywords: Time management · Academic performance

This study focuses on the importance of time management for students, while also exploring and proposing ways to improve it. We analyzed the correlation between time management and academic results and also different time management techniques. For data we conducted surveys to examine individual's time management strategies and their impact on university academic performance. This research is based on Shazia Nasrullah's (2015) study, examining the impact of time management on academic success and stress levels among students, Sean L. Humpherys (2021), goal to improve students time management skills. We expect time management will positively influence academic performance. Students with good time management will prioritize tasks better and are likely to achieve higher grades compared to those with worse time management. We share this research in hopes of helping students improve their time management and understand why it is important and how it contributes to academic success.

References:

Larissa Ageyeva, Larissa Lebedeva, Sholpan Aldibekova, Elmira Uaidullakyzy (2019) The Formation of Self-Organizational Skills of Student's Academic Activity on the Basis of 'Time Management' Technology 95-110

Sean L. Humpherys, Ibrahim Lazrig (2021) Effects of Teaching and Practice of Time Management Skills on Academic Performance in Computer Information Systems Courses 47-51

Shazia Nasrullah, Muhammad Saqib Khan (2015) The Impact of Time Management on the Students' Academic Achievements 66-72

5G Technology and Impact on Modern City Development

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Keywords: 5G · Internet of Things · Smart buildings.

5G technology is being applied more and more in creating and supplying new technolgies that will enhance human life. The impact of 5G technology in mobile communication and internet connectivity has been researched extensively. However, more research in needed to determine how the 5G technology is going to be used in modernising cities in which we live. Our study aims to find out how will 5G technology impact smart building development, public transport in cities and what issues could arise in creating such infrustructure. We will use quantitative data gathered from research articles for our research. The results of our research could be used in educational contexts and easing 5G integration in world's major cities.

References:

El-Shorbagy, A. M. (2021). 5G Technology and the Future of Architecture. Procedia ComputerScience, 182, 121-131.

Huseien, G. F., & Shah, K. W. (2022). A review on 5G technology for smart energy management and smart buildings in Singapore. Energy and AI, 7, 100116.

Mazhar, T., Malik, M. A., Haq, I., Rozeela, I., Ullah, I., Khan, M. A., ... & Hamam, H. (2022). The Role of ML, AI and 5G Technology in Smart Energy and Smart Building Management. Electronics, 11(23), 3960.

Psychological Signs of Lying and the Implications of It

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Keywords: Deception · Lying · Societal Impact · Human Behavior · Public Figures

This research delves into the complex realm of deception and its societal consequences, shedding light on how lying influences our interactions and the broader community. We aim to unravel the intricacies of how deception, a common human behavior, plays out on both an individual and societal scale. Employing video footage, we seek to understand and analyze deceptive acts in different contexts. The presentation will feature an insightful analysis of interviews with prominent public figures, dissecting their statements using diverse criteria to provide a real-world perspective on the nuances of lying. Additionally, our study incorporates insights from existing literature on lying, societal dynamics, and human behavior to offer a comprehensive understanding of the impact of deceptive practices.

References:

Fryling, M. J. (2016). A developmental-behavioral analysis of lying. International Journal of Psychology and Psychological Therapy, 16(1), 13-22.

Niroomand, P., Parvizi, M., & Russo, F. G. (2013). Some criteria for detecting capable Lie algebras. Journal of Algebra, 384, 36-44.

Vrij, A., Granhag, P. A., & Porter, S. (2010). Pitfalls and opportunities in nonverbal and verbal lie detection. Psychological science in the public interest, 11(3), 89-121.

Impact of Exercise on Academic Performance

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Keywords: Cognitive function · Academic performance

With the growing use of computers, exercise is becoming more unpopular, while having many positive effects like increased cognitive function, endurance and focus. This research article explores the relationship between exercise and academic performance. A study conducted by Cappelen, A (2017), shows the positive effects of physical activity on cognitive function in students. Results indicated significant improvements in attention and academic performance. Moreover, study was conducted among VU students to find out what students think. Findings revealed a positive association between higher levels of physical activity and academic success, emphasizing the importance of incorporating exercise into educational settings. This article contributes to the growing body of evidence supporting the notion that exercise plays a crucial role in promoting cognitive function and academic achievement in students.

References:

Cappelen, A. W., Charness, G., Ekström, M., Gneezy, U., & Tungodden, B.(2017). Exercise improves academic performance. NHH Dept. of Economics DiscussionPaper, (08).

Effects of Artificial Intelligence Use on Student Productivity and Learning Outcomes in Educational Settings

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Keywords: Artificial Intelligence · Student Productivity · Learning · Education · ChatGPT.

With the growing use of AI tools, exploring how artificial intelligence affects student productivity and learning outcomes in educational settings is gaining importance. Since each potential application of AI will give rise to positives and negatives (Chubb et al., 2022), ongoing research in this field is essential. While some praise AI tools such as Chat-GPT for providing students with personalized tutoring, automated essay grading, language translation, interactive learning and adaptive learning (Baidoo-anu et al., 2023) others are concerned about the impact of such technology use on academic performance and learning efficiency of a student. This research aims to offer valuable insights into the outcomes of ChatGPT use for educational purposes among high school students by gathering survey data and analysing existing literature that contains relevant information. In order to conclude our findings, data will be statistically analysed including both survey findings as well as discoveries from literature which includes real life experiments. As young individuals familiar with AI technologies, our study anticipates establishing a positive correlation between the use of chatbots and academic outcomes. By sharing viewpoints about both positive and negative aspects, this study spreads awareness and contributes valuable information for educators and policymakers to make informed decisions about integrating AI tools into educational settings.

References:

Baidoo-anu, D. & Owusu Ansah, L. (2023). Education in the Era of Generative Artificial Intelligence (AI): Understanding the Potential Benefits of ChatGPT in Promoting Teaching and Learning . Journal of AI, 7 (1), 56.

Chubb J., Cowling P., Reed D. (2022). Speeding up to keep up: exploring the use of AI in the research process. AI & Soc 37, 1453.

Advantages and Problems of Online Learning

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 $\label{eq:constraint} \begin{array}{l} \mbox{Keywords:} \ \mbox{Online education} \ \cdot \ \mbox{Self-regulated learning} \ \cdot \ \mbox{Productivity} \ \cdot \ \mbox{University students} \ \cdot \ \mbox{Online quality} \end{array}$

Traditional face-to-face learning has been the backbone of education, yet it grapples with limitations. Online learning emerges as a promising alternative, offering flexibility, convenience, and accessibility, but it also poses challenges. This research precisely evaluates the advantages and issues of online learning, examining its impact on student engagement, learning outcomes, and satisfaction. It delves into effective online learning strategies, aiming to optimize the digital learning experience. A methodical review of existing research ensures a thorough understanding, while survey among students will provide practical insights, complemented by testing of different online learning programs to identify the most successful approaches. These findings should encourage educational institutions to make informed decisions, promoting the advancement of online learning as an effective and accessible educational approach.

References:

BMC medical education, 21, 1-11. Van Wart, M., Ni, A., Medina, P., Canelon, J., Kordrostami, M., Zhang, J., & Liu, Y. (2020). Integrating students' perspectives about online learning: a hierarchy of factors. International Journal of Educational Technology in Higher Education, 17(1), 1-22.

Kedia, P., & Mishra, L. (2023). Exploring the factors influencing the effectiveness of online learning: A study on college students. Social Sciences & Humanities Open, 8(1), 100559

Zheng, M., Bender, D., & Lyon, C. (2021). Online learning during COVID-19 produced equivalent or better student course performance as compared with pre-pandemic: empirical evidence from a school-wide comparative study.

Correlation Between Marijuana Use, Depression and Anxiety

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Keywords: Mental health · Cannabinoids · Marijuana · Depression · Anxiety · Stress-induced Disorders · Recreational use.

With the idea of legalizing the recreational use of cannabis becoming more popular with each passing year, it is important to know the effects that marijuana may have on the users. There are numerous studies that tried to see whether there is a link between drug use and mental health conditions, specifically depression and anxiety, but the results of the studies were varied so it is still unclear. It is known that the short-term effects of marijuana can be either positive, such as experiencing euphoria, joy and relaxation, even sleepy, or negative - feeling anxious, experiencing paranoia, panic attacks and more. However, the exact long-term effects that it may have on mental health are still undetermined. This study aims to find out whether there is a definitive link between cannabis use and stress-induced mental disorders by conducting a meta- analysis of the current research done on the subject. Furthermore, this research includes an analysis of depression rates across various countries over time, aiming to discern potential correlations with trends in cannabis usage. The research findings can potentially inform public policy, medical practice, and the broader scientific community.

References:

Gilman, J. M., Schuster, R. M., Potter, K. W., Schmitt, W., Wheeler, G., Pachas, G. N., ... & Evins, A.E. (2022). Effect of medical marijuana card ownership on pain, insomnia, and affective disorder symptoms in adults: a randomized clinical trial. JAMA network open, 5(3), e222106-e222106.

Martin, E. L., Strickland, J. C., Schlienz, N. J., Munson, J., Jackson, H., Bonn-Miller, M. O., & amp; Vandrey, R. (2021). Antidepressant and anxiolytic effects of medicinal cannabis use in an observational trial. Frontiers in psychiatry, 12, 1554.

Shalit, N., Shoval, G., Shlosberg, D., Feingold, D., & amp; Lev-Ran, S. (2016). The association between cannabis use and suicidality among men and women: A population-based longitudinal study. Journal of affective disorders, 205, 216-224.

Optimizing Learning Models for Computer Science Students

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Keywords: Education · Active learning · Computer science · Learning methods

In education, the search for better learning methods challenges old-fashioned one-sided classes. Active learning brings a lively, participatory way, engaging students actively. This research focuses on implementing active learning strategies within computer science education, aiming to identify preferred techniques and their impact on knowledge retention and overall learning outcomes. The research data will be collected in a quantitative method by conducting survey regarding active learning methods students are familiar with, which methods are applied in their education, and which ones they find most effective in the context of computer science and learning in general. In addition, group of students will be asked to use specific learning methods for a week. During this small experiment they will be asked to take notes of the time spent learning, learning progress and academic results. The collected data will reveal which methods rank as the most effective learning approaches.

References:

KAMATH, B. S. (2022). An Implementation of Active Learning Strategies for Effective Use of In-class Hour to Achieve Complete Knowledge Transfer in an Engineering Course. Journal of Pharmaceutical Negative Results, 480-489.

Melo, G., Monteza, D., Colson, G., & Zhang, Y. Y. (2022). How to assess? Student preferences for methods to assess experiential learning: A best-worst scaling approach. PLoS One, 17(10), e0276745.

Saxena, P., Singh, S. K., & Gupta, G. (2023). Achieving Effective Learning Outcomes through the Use of Analogies in Teaching Computer Science. Mathematics, 11(15), 3340.