HumanTech Summit 2023

BOOK OF ABSTRACTS

9–10.12.2023

SWPS UNIVERSITY

The second edition of the international scientific conference, HumanTech Summit, is organized by the HumanTech Center at SWPS University.

Our mission is to connect people from different spheres of life and showcase the fact that neither technology without humans nor humans without technology can accomplish as much individually as they can when working together.

EMBRACING HUMANITY, INSPIRING THROUGH TECHNOLOGY

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HumanTech Center
SWPS University

This is the only center in Poland that deals with both social and technological innovations, and it is also the only center of its kind operating within a university with a humanistic profile.

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DAY I

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Magdalena Wojcieszak
(University of California, Davis, USA / University of Warsaw, Poland)

KEYNOTE:
MAKING SENSE OF MODERN AI

MICHAŁ KOSIŃSKI
(STANFORD UNIVERSITY, USA)

Artificial Intelligence (AI), particularly Large Language Models (LLMs), has made significant strides in recent years, transforming the way we live and work. This talk delves into the wide-ranging implications of AI for modern organizations, societies, and individuals. By understanding the capabilities and limitations of these advanced models, we can harness their potential for decision-making, creativity, collaboration, and problem-solving. We will address critical questions surrounding the ethical, economic, and social aspects of LLMs and AI. Join us for an engaging and thought-provoking discussion on navigating the AI revolution and shaping a better future.

MICHAŁ KOSIŃSKI

Michal is a Professor at Stanford University. His research interests encompass both human and artificial cognition. His current work centers on examining the psychological processes in Large Language Models (LLMs), and leveraging Artificial Intelligence (AI), Machine Learning (ML), Big Data, and computational techniques to model and predict human behavior.

Michal has co-authored Modern Psychometrics (a popular textbook) and published over 90 peer-reviewed papers in leading journals including Nature Scientific Reports, Proceedings of the National Academy of Sciences, Psychological Science, Journal of Personality and Social Psychology, and Machine Learning, that have been cited over 20,000 times. He is among the Top 1% of the Highly Cited Researchers according to Clarivate. His research inspired a cover of The Economist, a 2014 theatre play "Privacy", multiple TED talks, a video game, and was discussed in thousands of books, press articles, podcasts, and documentaries.

Michal was behind the first press article warning against Cambridge Analytica. His research exposed the privacy risks that they have exploited and measured the efficiency of their methods. He holds a doctorate in psychology from the University of Cambridge and master's degrees in psychometrics and in social psychology. He used to work as a post-doctoral scholar at Stanford's Computer Science Department, the Deputy Director of the University of Cambridge Psychometrics Centre, and a researcher at Microsoft Research (Machine Learning Group).

SESSION I:
DATA AND THE LANGUAGE MODELS

1. Data Governance in a Trilemma: A Qualitative Analysis of Rights, Values, and Goals in Building Data Commons
Jan Oleszczuk Zygmuntowski (Kozminski University, Warsaw)

2. Live Comply - AI for managing sensitive data
Grzegorz Kanka (MsC of Laws), Aleksander Smywinski-Pohl (AGH University of Cracow)

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Izabella Krzemińska (Orange)

Data Governance in a Trilemma: A Qualitative Analysis of Rights, Values, and Goals in Building Data Commons

JAN OLESZCZUK ZYGMUNTOWSKI
(KOZMINSKI UNIVERSITY, WARSAW)

Most of the discussions on data governance stress legal and technological aspects, while avoiding the discussion of power, stakeholder interests, and value. In order to move from formal debates to operational institution-building, we ask about the goals of data governance for different stakeholders and why data commons can be useful in achieving them.

We discuss the evolution of data governance over time and cast light on the antagonism between three main goals of data governance: protecting fundamental rights, generating economic value and serving public interest. Given the necessity to navigate this conflicted political economy of data, we introduce the data governance trilemma (DGT) model. We turn to data commons as an institution capable of solving the collective action problem and negotiating acceptable configuration of the DGT goals. In order to operationalize data commons using DGT, we conducted workshops combining the critical success factors (CSFs) method with a deliberative Delphi technique.

We find that the systemic configuration of data governance should be restructured towards data sovereignty, founded on institutional trust, protection of rights, and obligatory data sharing with the public interest in mind. Based on our results, we claim that unless we build data commons to steward data as a democratic medium, a lack of legitimization will riddle attempts to govern data better, and societal benefits will fail to manifest.

Live Comply – AI for managing sensitive data

GRZEGORZ KANKA (MSC OF LAWS),
ALEKSANDER SMYWINSKI-POHL
(AGH UNIVERSITY OF CRACOW)

Live Comply, the project and ready-made application is concerned with intelligent analysis and management of sensitive data in organizations. Adapted to the Polish law, whose primary goal is to automate the process of GDPR / CPP data management and continuous compliance analysis in organizations. Live Comply is a solution based on artificial intelligence (AI) and document automation (RDA). It is the result of collaboration between Data Science teams and auditors specializing in Regulatory Law.

The AI-powered solution is presented in Polish, English and can be applied to other languages, taking into account the regional specificities of each country in terms of personal data storage. Which makes it a unique tool with analysis and control of continuous compliance to the ever-changing regulatory issues in both EU, GB and North American countries. It can be used both by data administrators, data security officers, lawyers, auditors and specialists dealing with legal issues (employees of authorities, entrepreneurs, investors). The project's name comes from Continuous Data Compliance, as the system automatically scans in real time the selected environment/data sources, and then begins searching for sensitive data. It identifies individual data types and detects relationships between them - and its other unique function. The administrator has a view of the results and reports, and then makes a decision to secure sensitive data if necessary.

The research performed confirms the significantly higher effectiveness of Live Comply in the detection of personal data relative to other available tools on the international and Polish market. The system is widely used in data search automation, continuous monitoring, realization of the right to be forgotten, consolidation of customer data.

Lost in Translation: Analyzing the Challenges Faced by Large Language Models in Psychometry on the Example of Comparison of Recognition of Cognitive Emotion Regulation Strategies By LLMs Models and Human Raters

WIKTORIA MIELESZCZENKO-KOWSZEWICZ
(WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY),
LUKE GASSMANN (UNIVERSITY OF BRISTOL)

Since the public release of the GPT 3 model in 2023, its versatile applications have been explored across various domains, including the field of psychology. This study delves into the potential of Large Language Models (LLMs) in psychometry.

Specifically, we investigated the accuracy of LLMs, namely ChatGPT versions 3.5 and 4 and Google's Bard in recognizing cognitive emotion regulation strategies from 474 fragments derived from narratives of individuals who have experienced traumatic events. These fragments comprise nine distinct cognitive emotion regulation strategies identified by human raters as a ground truth metric. The LLMs were provided with the same instructions as humans, and we compared the results. GPT 3.5 successfully recognized the strategies with an accuracy of 37.8%, while GPT 4 exhibited a deteriorated recognition rate of 31.4%. Meanwhile, Google's Bard performs at an accuracy of 55.2%. This research shows that LLM models do not have enough capabilities to recognize psychological mechanisms. The future of AI psychometry demands the gathering of larger datasets to effectively evaluate LLMs, as well as, setting the psychometric metrics to effectively assess their performance in psychological tasks.

Additionally, our study explores the potential limitations and challenges faced by LLMs in understanding complex human emotions and cognitive processes. We also discuss the implications of our findings for the future development of AI-powered tools in the field of mental health and trauma therapy.

Personalization Individualization of experiences. Moonshot or a pitfall?

IZABELLA KRZEMIŃSKA
(ORANGE)

We live in times where the rapid development of technology enables the mplementation of concepts beyond the average person's imagination. We
explore new possibilities of generative AI with the enthusiasm of conquistadors, unsure of what impact this testing of boundaries has on umans. As users, we shift our attention to direct experience. Our feelings and experiences become an element designed by data engineers. Conversely, as business owners, we see the benefits of automating experience building and tailoring the product individually to everyone. Technologies enable the full implementation of the assumptions of the Industry 4.0 concept, and more attention on humans is needed to gain more.
A speech prepared based on experience working in R&D will focus on using available technology to individualize user experience, e.g. applications, communication with a virtual agent or experience in XR. Why is knowledge about the user, such as his personality (Big 5), necessary, and how is it acquired (there is no insignificant data)? What are the benefits of this approach, and what are the pitfalls? Is it possible to individualize experiences ethically to avoid harming people (ethics by design)? Is individualization of experience always beneficial to the user? These are just some dilemmas a researcher of human-virtual entity interactions may encounter.

KEYNOTE:
BROADENING PARTICIPATION IN HRI: CO-DESIGN WITH OLDER ADULTS, CHILDREN, AND THEIR CAREGIVERS

SELMA SEBANOVIC
(INDIANA UNIVERSITY BLOOMINGTON, USA)

Robots are designed for use in many different contexts, such as homes, schools, and healthcare institutions, by diverse users, including children, older adults, their family members and other formal and informal caregivers. Robotics design, therefore, should include the needs, values, and preferences of these diverse direct and indirect users. Including diverse groups of participants in the design of robots, however, can be challenging, as it requires accommodating different cognitive capabilities, knowledge, and expectations regarding technology while envisioning the potential of technologies that are still emerging. In this talk,

I will discuss the project methods and outcomes that my lab has been exploring in the co-design of robots for socially assistive and educational uses in the homes of older adults and children. We will reflect on ways to develop activities that provide inherent benefits to their participants, how to present information about robots so diverse populations can provide informed perspectives on their potential functions and uses, and how to address the diverse needs of multiple stakeholders in the co-design process.

SELMA ŠABANOVIĆ

Selma is a Professor of Informatics and Cognitive Science at Indiana University Bloomington. She studies social robotics and human-robot interaction, with a focus on exploring how robots should be designed to assist people in various use contexts, including mental health, wellness, education, and social participation. She works with current and potential robot users of all ages, from children to older adults, and in various cultures, including East Asia, Europe, and the US. She currently serves as the Editor in Chief of the ACM Transactions on Human-Robot Interaction, and as the Associate Dean of Faculty Affairs for the Luddy School. She received her PhD in Science and Technology Studies in 2007 from Rensselaer Polytechnic Institute.

SESSION II:
ATTITUDES AND BEHAVIOR TOWARDS ROBOTS

1. What do Poles think about robots? Results of a nationwide survey
Krzysztof Walas (IDEAS NCBR), Sonia Ziemba - Domańska,
Konrad Maj (SWPS, Warszawa)

2. Robot as an authority and a learner. Milgram paradigm involving a humanoid robot
Konrad Maj, Tomasz Grzyb, Dariusz Doliński
(SWPS University, Warsaw)

3. Human perspectives on social robots. Introducing Polish versions of the questionnaires to measure attitudes towards robots and exposure to science fiction
Aleksandra Wasielewska
(Adam Mickiewicz University, Poznań)

What do Poles think about robots?
Results of a nationwide survey

KRZYSZTOF WALAS (IDEAS NCBIR),
SONIA ZIEMBA - DOMAŃSKA, KONRAD MAJ
(SWPS, WARSZAWA)

The topic of artificial intelligence and robotization raises a lot of uncertainty among Poles, but, what is particularly noteworthy, it also raises curiosity and awareness of the technologization of societies. These views, of course, depend on many factors, such as education, professional experience, age, or the level of technological advancement in a given region. To find out what Poles think about robots, IDEAS NCBR, in cooperation with the HumanTech Center of the SWPS University, conducted a nationwide survey in which 1,052 Poles (N=1,052) aged over 18 took part. It was carried out using the CAWI quantitative research method using a survey on the Ariadna panel, data was collected in the period October 26-30, 2023

The research shows that Poles derive their knowledge about robots primarily from the media and press (46%), which is the main source of information (for comparison, scientific books 9%, school/education 9%). Interestingly, we are in favor of conducting research on the development of robotics and robots, but in a careful and supervised manner (68% of respondents). Among young respondents, when asked about their feelings about the sight of a robot resembling a human in appearance and behavior, 31% of respondents felt fear and 46% felt fear. Perhaps that is why Poles cannot imagine deep relationships with robots, they could like them (47% of respondents), but only about 18% of respondents could make friends with a robot.

A promising result is the fact that as many as 41% of surveyed Poles would be willing to use new, intelligent technologies to teach a child, 30% would use a robot to support development from an early age. Nearly half of the respondents would use a robot resembling a human to support the elderly, which is definitely a prognostic result. An absolutely surprising result was the answer to the question "Imagine that you are an employer and due to the lack of people willing to work in Poland, you were faced with the dilemma of employing an immigrant for simple physical work or using a robot." Which solution would you choose?... employing a robot or employing an emigrant. 34% of women and 46% of men would decide to employ a robot, while 30% of women and 26% of men would employ an immigrant. This area requires in- depth analysis and social discourse, and the entire report proves the necessity of education in the development of robotics.

The entire report is available on the website of USWPS and IDEAS NCBR.

Robot as an authority and a learner.
Milgram paradigm involving a humanoid robot

KONRAD MAJ, TOMASZ GRZYB, DARIUSZ DOLIŃSKI
(SWPS UNIVERSITY)

Robots will increasingly be embedded in the role of managing humans, but they already often influence our behavior through various commands and instructions. It is therefore important to learn about our attitudes and the degree of submission to them.

The presentation will discuss a series of experiments based on Stanley Milgram's classic paradigm (1963, 1965, and 1974). In the first experiment, a robot acted as an authority figure and the learner was an actor pretending to be the real subject, and the teacher's task was to electrocute the learner when he made a mistake in remembering information he was supposed to have learned earlier. The results showed 90% obedience to both the robot and the human. In the second experiment, the roles were switched - the robot became the learner. In this case, 95% of the subjects acquiesced to the infliction of an electrical stimulus on the robot. In the third study, we decided to use the research scheme of Cormier and colleagues (Cormier, Seo, Young, 2016), which seems more ecologically accurate, namely, the subjects were asked to perform a tedious task (swapping file names in the computer). It turned out that 63% of the subjects in the robot-authority condition agreed to perform this sentence without protest for an hour, and in the case of the control group (when the authority was a human), this number rose to 76%.

The presentation will present the theoretical and practical implications of the research conducted. All experiments were performed with the approval of the university research ethics committee.

Human perspectives on social robots. Introducing Polish versions of the questionnaires to measure attitudes towards robots and exposure to science fiction

ALEKSANDRA WASIELEWSKA
(ADAM MICKIEWICZ UNIVERSITY, POZNAŃ)

Robots become more prevalent in various aspects of our daily lives, and they will increasingly engage with humans in close and intimate interactions. This is especially true of social robots due to their autonomous behaviour, ability to communicate and interact with other social agents. Exploring people's attitudes towards social robots provides valuable insight into the 'human' side of these interactions. This investigation yields both cognitive and practical benefits, such as a better understanding of the motivation and processing of human-robot interaction, anticipating its consequences, providing solutions for robot design and guidance on improving human-robot interaction.

In this talk, I present three questionnaires adapted to Polish. Two of them, the General Attitudes Towards Robots Scale (GAToRS; Koverola et al., 2022) and the Human–Robot Interaction Evaluation Scale (HRIES; Spatola et al., 2021), were developed to measure human attitudes towards robots. The third one is the Science Fiction Hobbyism Scale (SFHS; Laakasuo et al., 2018). The Polish versions of GAToRS, HRIES and SFHS complement the relatively modest collection of Polish-language questionnaires related to attitudes towards robots. The scales open new possibilities for Polish Human-Robot Interaction research as well as for cross-cultural comparisons.

The adaptation procedure included forward translation, backward translation, and language accuracy examination conducted by several independent experts and finalised in agreement. Two studies (n=101 and n=102) were conducted to establish the structure and psychometric properties of the resulting questionnaires. All three scales proved to be valid and reliable – Cronbach's alpha coefficient values for the subscales range from 0.6 to 0.9. Factor analysis of the GAToRS-PL and HRIES-PL revealed that these scales retained the number of factors from the original versions, but their internal structure is slightly different from the original ones. The SFHS has the same number of items as the original but reveals a two-factor structure.

KEYNOTE:
VIRTUAL BODIES

CHRISTIAN KLAES
(RUHR UNIVERSITY BOCHUM, GERMANY)

Advances in artificial intelligence (AI) enable new ways of exercising and experiencing power by automating interpersonal tasks such as interviewing and hiring workers, managing and evaluating work, setting compensation, and negotiating deals. As these techniques become more sophisticated, they increasingly support personalization where users can "tell" their AI assistants not only what to do, but how to do it: in effect, dictating the ethical values that govern the assistant's behavior. Importantly, these new forms of power could bypass existing social and regulatory checks on unethical behavior by introducing a new agent into the equation. Organization research suggests that acting through human agents (i.e., the problem of indirect agency) can undermine ethical forecasting such that actors believe they are acting ethically, yet a) show less benevolence for the recipients of their power, b) receive less blame for ethical lapses, and c) anticipate less retribution for unethical behavior.

In this talk, I will review a series of studies illustrating how, across a wide range of social tasks, people may behave less ethically and be more willing to deceive when acting through AI agents. I conclude by examining boundary conditions and discussing potential directions for future research.

CHRISTIAN KLAES

Professor Dr. Christian Klaes is a neuroscientist at the Ruhr-University in Bochum. His research focuses on Brain-Computer Interfaces (BCI), Virtual Reality, and Artificial Intelligence (AI) in medicine. He has extensive experience in neurophysiology, working with non-human primates and tetraplegic human patients. To analyze and classify neural data, he uses machine learning algorithms.

His research has been funded by grants from the DFG and the European Union. Previously, he worked at the California Institute of Technology as a post-doc, focusing on clinical BCI applications. After returning to Germany, he established his research lab, funded by an Emmy Noether stipend. In 2021, he became Professor for Neurotechnology at the Ruhr-University Bochum. Christian Klaes obtained his PhD at the University of Göttingen. He currently also leads the Incubator Health+ of the WorldFactory Start-up Center at the Ruhr University Bochum.

SESSION III:
GAMING AND VIRTUAL BODIES

1. What are gaming withdrawal symptoms and how to measure them? Results from the systematic review of withdrawal's role in contemporary gaming disorder research
Aleksandra Zajas, Sylwia Starzec
(Jagiellonian University, Kraków)

2. Video game proficiency can be predicted from EEG oscillatory indexes of visual working memory
Aneta Brzezicka (SWPS University)

3. Territorial Change in the Metaverse: The Implications on International Relations
Atilla Arda Beşen (University of Warsaw / VolareVers)

4. Phantom touch in virtual bodies
Artur Pilaciński (Ruhr University Bochum, Germany)

What are gaming withdrawal symptoms and how to measure them? Results from the systematic review of withdrawal's role in contemporary gaming disorder research

ALEKSANDRA ZAJAS, SYLWIA STARZEC
(JAGIELLONIAN UNIVERSITY, KRAKÓW)

Since there are more than 3 billion gamers globally, problems linked to gaming are receiving more attention in the social and medical sciences. The result of multiple research in this regard was the inclusion of Internet Gaming Disorder (IGD) in DSM-5 in 2013 and later Gaming Disorder (GD) was added to ICD-11 in 2019. One of the most controversial criteria in IGD, not included in GD, was the presence of withdrawal symptoms.

To provide empirical evidence investigating the role of withdrawal in gaming disorder, we conducted a systematic review of the conceptual and operational definition of withdrawal in research practice. We have selected N = 32 studies published between January 2018 and January 2023, according to the PRISMA 2020 guidelines. Most studies were conducted within the correlation framework (n = 26), using convenience samples (n = 16) and/or self-assessment questionnaires (n = 31). There were also examples of research on clinical samples and clinical case studies. The conceptual definition was created based on 1) the specific definition provided by the author(s), 2) the symptoms identified from the measurement tools through withdrawal check items, and 3) the description of the subjects of their withdrawal experiences. All authors conceptualized withdrawal with the use of affective components of withdrawal symptoms and less frequently behavioral, cognitive, physical or neurological components. The most common terminology used for gaming-related disorders is based on DSM-5 (IGD; n = 26). Only one of the analyzed studies referred to Gaming Disorder defined in ICD-11. Finally, only 6 experimental studies included some form of abstinence control. The review confirmed that there is a gap of experimental or longitudinal research, which focus on the complexities of withdrawal symptoms and holistically show its multiple aspects.

Video game proficiency can be predicted from EEG oscillatory indexes of visual working memory

ANETA BRZEZICKA
(SWPS UNIVERSITY)

While video gaming training may enhance visual working memory (VWM), it is also a key cognitive function for effective video game play. Here, we investigated whether in-game proficiency can be predicted by VWM capacity as indexed by EEG oscillations. Our participants were divided into two training groups that differed in the complexity of the training environment: fixed (FEG) (n=21) and variable (VEG) (n=22), with the second being more challenging. Both groups were trained in StarCraft II for 30 hours. EEG data gathering was conducted before and after the onset of training within a change detection paradigm that measures VWM capacity. Initial (pre-training) behavioral and neuropsychological indicators were specified as predictors of in-game advancement, as indexed by variables that were derived from gameplay telemetry (i.e. time series data describing game states and actions).

Our main results showed that the initial behavioral and neurophysiological indicators could be used to predict the level of proficiency that our participants achieved during training. Higher levels of the initial alpha power and lower levels of initial theta power were associated with greater in-game results. Interestingly, these effects were stronger for VEG participants with significantly higher in-game advancement. This may show the crucial role of a challenging environment in developing the potential of individual players.

Territorial Change in the Metaverse: The Implications on International Relations

ATILLA ARDA BEŞEN
(UNIVERSITY OF WARSAW / VOLAREVERS)

This study primarily investigates the future of nation-states within the context of the Metaverse, providing a geopolitical analysis of the transformation of territories resulting from the changing social dynamics of individuals. In this study, our focus lies in exploring the influence of nonstate Metaverse realms on the transformation of spatial and territorial dynamics. As authority within the Metaverse increasingly transitions to multinational corporations, we aim to examine how these Metaverse universes, distinct from traditional state territories, contribute to this shift in spatial and territorial dynamics.

Our research also delves into the relationship between territorial changes and the accumulation of capital in the context of this new social order. This analysis is complemented by an investigation into the changing political and economic dynamics. As a result of these inquiries, we draw upon the synthesis of David Harvey's work on 'Capital Accumulation' and 'Spaces of Capitalism' while also considering functionalism. This approach leads us to perceive the shifting role of nation-state borders from the state level to that of multinational corporations. Lastly, we examine the influence of capital on territorial changes by investigating the interactions between individuals, the transition of authority, and the formation of decentralized autonomous organizations (DAOs).

The research will investigate the following questions; how does the spatial turn of capital accumulation along with the emergence of new technologies? How does the Metaverse technology affect the perception of the border / space? How does the spatial transformation of capital accumulation in the Metaverse occur?

Phantom touch in virtual bodies

ARTUR PILACIŃSKI

(RUHR UNIVERSITY)

You can't tickle yourself. If you try sliding a finger along your forearm, the tickle sensation will be much weaker than if there was an insect crawling down your skin. This is because the nervous system attenuates the predicted sensory input caused by your own movements (Blakemore et al., 2000). This mechanism is called tactile gating/tactile gating. But what happens with tactile attenuation if there is no afferent tactile signal?

Here, we tested this using an immersive virtual reality (VR) scenario in which subjects touched their body using a virtual object. This touch resulted in a tingling sensation corresponding to the location touched on the virtual body. We called it phantom touch illusion (PTI). The subjectively-reported intensity of the illusion has different strength across different parts of the hand. Interestingly, the illusion was also present when subjects touched invisible (inferred) parts of their limb.

We reason that PTI results from the tactile gating process during self-touch. The presence of PTI when touching invisible body parts suggests that tactile attenuation is not exclusively based on vision, but rather on multi-sensory input involving body schema.

KEYNOTE:
HYBRID AGENCIES IN BIOLOGICAL
AND ARTIFICIAL SYSTEMS

ANNA CIAUNICA
(UNIVERSITY OF LISBON, PORTUGAL)

Humans have long tried to make artificial versions of themselves. Recent technological advances in social robotics, Virtual Reality and Artificial Intelligence put us closer than ever to this dream. A robust body of work illustrates that we spontaneously attribute human-like mental and physical states to artificial others and interact with them accordingly. By contrast, the effect of interacting with artificial others on the human minds and bodies remains largely unexplored.

Here I will look at the effect of interacting with artificial agents on the human sense of self and agency. Specifically, I will examine how the feeling of being connected or disconnected from one's self and body affects and is affected by interactions with artificial agents such as robots and VR. I will conclude with some general remarks about the very distinction between (artificial) minds and bodies as the core structure of how we approach human experiences and our relation to the real and virtual worlds. I will also discuss the implications of this new type of hybrid agency on our understanding of human creativity and sense of presence in the world, by presenting briefly an Arts & Science installation.

ANNA CIAUNICA

Dr Anna Ciaunica is a Principal Investigator at the Centre for Philosophy of Science, University of Lisbon, Portugal; and Research Associate at the Institute of Cognitive Neuroscience, University College London, the UK. Before that she was Research Associate at the Department of Clinical, Educational and Health Psychology, University College London; and postdoctoral researcher at the Department of Philosophy, University of Fribourg, Switzerland. She obtained her PhD from the University of Burgundy, Dijon, France.

Anna is currently Principal Investigator on three interdisciplinary projects looking at the relationship between self-awareness, embodiment and social interactions in humans and artificial agents. Her approach is highly interdisciplinary, using methods from philosophy, experimental psychology, cognitive neuroscience, phenomenology and arts. More recently, Anna has deepened the concept of minimal selfhood in utero developing as a process of co-embodiment and co-homeostasis. Apart from the numerous scientific papers published, Anna is currently working on a book: 'From Cells to Selves: the Co-Embodied Roots of Human Self-Consciousness'.

She is also coordinator of the Network for Embodied Consciousness, Technology and the Arts (NECTArs) – a collaborative platform bringing together artists, researchers, stakeholders, policy makers and people with lived experiences, aiming at fostering creative solutions to timely questions such as self-consciousness and (dis)embodiment in our hyper-digitalized and hyper-connected world.

KEYNOTE:
PLATFORM ALGORITHMS -
PROBLEMS AND SOLUTIONS

MAGDALENA WOJCIESZAK
(UNIVERSITY OF CALIFORNIA, DAVIS, USA /
UNIVERSITY OF WARSAW, POLAND)

Populism, polarization, misinformation, and wavering support for democratic norms are pressing threats to many democracies. Although the sources of these threats are multifaceted, social media platforms and their recommendation algorithms are often seen as the culprit. Many observers and scholars worry that users encounter misinformation and congenial information on platforms and that algorithms lead to filter bubbles and rabbit holes of radicalization.

In this presentation, I address these issues in two ways. First, I argue that although most scholars worry about misinformation and ideological biases in recommender systems, interest-based biases are as – if not more – democratically consequential. The problem is less that people consume "bad" political content (radical, unverified, or otherwise problematic), but that most do not consume any at all. Second, I present two computational interventions. The first was an over-time field experiment on Twitter, relying on NLP-trained chat bots that interacted, in real time, with 28,000 Twitter users to encourage hem to follow news accounts. The second was a month-long experiment, for which a large sample of regular YouTube users installed a browser extension that nudged the algorithm versus the users toward incentivizing greater recommendations and exposure to quality news on social media. I then integrate these studies, discussing how LLMs and transparent algorithms could help minimize some of the democratic challenges.

MAGDALENA WOJCIESZAK

Magdalena Wojcieszak is a Professor of Communication at UC Davis, an Associate Researcher at the Center for Excellence in Social Science at the U of Warsaw, Poland. She is also an Affiliate Faculty, Designated Emphasis in Computational Social Science and a Member of the Graduate Group in Computer Science at UC Davis.

She examines how people select (political) information online, the effects of mass and digital media on extremity, polarization, and (mis)perceptions, and also studies what interventions to users and platform algorithms can promote exposure to quality and diverse political contents online. Prof. Wojcieszak has just been awarded an ERC Consolidator Grant for a project NEWSUSE: Incentivizing Citizen Exposure to Quality News Online: Framework and Tools (2023-2028); before she directed ERC Starting Grant EXPO: Exposure to Dissimilar Views: Investigating Backfire Effects at the Amsterdam School of Communication Research, U. of Amsterdam (2018-2023). She also leads several other projects on algorithmic audits and computational interventions to identify and minimize harmful content on YouTube.

Prof. Wojcieszak has (co-)authored ~90 articles in peer-reviewed journals (including Science, Nature, Science Advances, Proceedings of National Academy of Sciences, among others), is the Associate Editor of Journal of Communication, is part of an independent research partnership between researchers and Meta to study the impact of Facebook and Instagram on key political attitudes and behaviors during the U.S. 2020 elections, known as the U.S. 2020 Facebook & Instagram Election Study, and of the Misinformation Committee at the Social Science One, first ever partnership between academic researchers and social media platforms. She has received several awards for her teaching and research (including being named the 2023 Fellow of the International Communication Association).

DAY II

1. Keynote:
VR for mental health – out of the lab, into the world
Zillah Watson (Phase Space, UK)

2. Session IV: Immersive technologies in psychological assistance and intervention

3. Keynote:
The Symbiosis of Language and Technology: A New Era of Business Communication
Anne Scherer (University of Zurich)

4. Session V: Internet intervention & internet addiction

5. Keynote:
How delegating to AI can weaken social ties and encourage unethical behavior
Jonathan Gratch (University of Southern California, USA)

6. Session VI: AI in practice – opportunities and challenges

KEYNOTE:
VR FOR MENTAL HEALTH –
OUT OF THE LAB, INTO THE WORLD

ZILLAH WATSON
(PHASE SPACE, UK)

Since the 1990s, VR lab research has consistently shown the value of VR in mental health. What's now holding it back? Drawing on the lessons of the BBC's VR studio, this talk will point to the fact that good content is required to achieve great results. Creating this will require interdisciplinary collaboration between medical, technical and creative industries. This talk will take a big picture view of the VR industry, and focus on the steps needed to achieve mainstream adoption.

ZILLAH WATSON

Zillah led the BBC's award-winning VR studio and is an expert on the commissioning, creation and distribution of immersive content.

She recently co-founded Phase Space with Katie Grayson, a start-up bringing together the best of the UK's creative, technical and medical industries to use VR to bring a step change in mental health support. They are currently working in partnership with St George's University of London and Goldsmith's University of London to develop and test a VR experience to reduce stress and anxiety in students before exams. Zillah lectures in documentary and immersive storytelling at UCL and the London Interdisciplinary School.

She led research on the impact of VR storytelling with Professor Mel Slater at the BBC, and was a visiting fellow at the Reuter's Journalism Institute, University of Oxford, where she authored "VR for News: A New Reality."

SESSION IV:
IMMERSIVE TECHNOLOGIES IN PSYCHOLOGICAL ASSISTANCE AND INTERVENTION

1. Mental toughness development training using virtual reality (VR)
Martyna Kotyśko (University of Warmia and Mazury, Olsztyn),
Ewa Waszkiewicz

2. Using VR to evaluate attentional and behavioral avoidance – an example of public speaking task
Michał Skorupski (SWPS University, Katowice)

3. Depth perception of virtual objects in augmented reality – empirical study
Jacek Matulewski (Nicolaus Copernicus University, Toruń / Vobacom),
Albert Łukasik, Klaudia Karkowska

Mental toughness development training using virtual reality (VR)

MARTYNA KOTYŚKO (UNIVERSITY OF WARMIA AND MAZURY, OLSZTYN), EWA WASZKIEWICZ

Psychological resilience (PR) is a resource of individual functioning that enables rapid adaptation in situations of stress, pressure, and challenges, regardless of circumstances. According to Clough, it is understood as a four-dimensional construct, encompassing engagement, challenge, self-confidence, and a sense of control. The presentation will outline the results of a research project on the application of virtual reality (VR) in developing psychological resilience.

The project aimed to: (1) create a scientifically validated PR development training that goes beyond professional roles and experiences; (2) assess the impact of VR conditions on PR growth. The research procedure involved the use of PR development training (developed and verified in a preliminary study) in three experimental conditions: an online baseline version (O-T; involving training with a trainer), a VR version with a trainer (VR-T; where a trainer and technical assistant accompany the participant during training tasks), and a self-training version (VR-A; where the participant undergoes training using VR without a trainer, with exclusive technical assistance from a programmer). Participants in each experimental condition completed a series of 8 PR-developing tasks at two levels.

The Mental Toughness Questionnaire – 48 (MTQ-48) was used to measure the baseline and final levels of PR. Sixty adults with PR scores ranging from 3-7 in sten ranges were qualified to participate. Participants were randomly assigned to three experimental conditions in a 3x20 format. Training was completed by O-T, n=17; VR-T, n=16; and VR-A, n=18. Through conducted statistical analyses, it was examined whether the results of individuals randomly assigned to different training conditions changed over time (PRE-POST measurement) and whether the experimental condition played a significant role in shaping the final results. The conducted two-way analysis of variance with repeated measures showed a significant main effect of measurement, but the experimental condition and the interaction of measurement and experimental condition were not significant.

The results suggest that implementing PR development training in each of the three experimental conditions produces the desired effect of improving results in the questionnaire measurement of PR.

Using VR to evaluate attentional and behavioral avoidance – an example of public speaking task

MICHAŁ SKORUPSKI
(SWPS UNIVERSITY, KATOWICE)

Attentional avoidance refers to the act of shifting attention away from stimuli perceived as threatening to any non-threatening target. Elevated levels of attentional avoidance are associated with PTSD, panic disorder, generalized anxiety disorder, OCD and phobic disorders. Moreover, avoidance can hinder treatment and support maintenance of these disorders. On the other hand, the ability to move one's attention away from negative emotional stimuli can play an adaptive role, as impaired attentional disengagement from negative stimuli is believed to be associated with maladaptive task-unrelated thoughts.

Attentional avoidance is notoriously difficult to measure, especially in ecological conditions. Self-description based measures are likely to be ineffective, as attentional avoidance mechanisms tend to work outside of the scope of participants' control or awareness and more objective indicators are difficult to utilize in a real-world environment. We are developing a virtual reality (VR) attentional avoidance measurement procedure, which we hypothesize will enable us to measure attentional avoidance of emotional stimuli in a way that will be both objective and more ecologically valid than standard laboratory procedures. In this procedure, participants give a speech to an audience of VR avatars, expressing positive, negative and neutral emotions towards the speaker. Eye-tracking and movement tracking provide data on how often and how strongly the participants tend to avoid contact with each type of avatar.

In this presentation, we describe the rationale of the procedure, the design strategy, the theoretical basis, and practical findings that guide our decisions throughout the process. We outline the selection process of details such as VR avatars' characteristics, facial expression models and space characteristics. We mark out the testing plan for the procedure, as well as measures undertaken to maximize the participants' immersion without compromising repeatability and controllability of the environment.

Depth perception of virtual objects in augmented reality – empirical study

JACEK MATULEWSKI (NICOLAUS COPERNICUS UNIVERSITY, TORUŃ / VOBACOM), ALBERT ŁUKASIK, KLAUDIA KARKOWSKA

Augmented reality (AR) is a technology that allows for displaying virtual objects in a real environment. Due to its wide range of applications, this technology is increasingly being implemented, from research applications, through clinical applications, to education. The simultaneous development of the technology raises several questions, both of a technical and social nature, as well as from the user experience perspective.

In our study, we investigated the subjective perception of depth (the distance between virtual objects and the user), discomfort, anxiety, and the presence of symptoms typical for simulation sickness (also known as cybersickness) resulting from the display of objects outside the perimeter of the physical room. We conducted the study on several models differing in both category and level of realism. Our aim is to present the results obtained from the study and analyze them in the context of future augmented reality applications.

KEYNOTE:
THE SYMBIOSIS OF LANGUAGE AND TECHNOLOGY: A NEW ERA OF BUSINESS COMMUNICATION

ANNE SCHERER
(UNIVERSITY OF ZURICH)

In her talk, Anne delves into the transformative impact of AI on the marketing and business communication landscape. She explains how tailored communication styles can significantly enhance business outcomes and explores the revolutionary role of large language models in automating and optimizing language styles, opening up unprecedented possibilities for interpersonal and corporate communication. The talk ends with an outlook on a future where large language models not only streamline communication but also enrich it, effectively bridging the gap between technological capability and human nuance.

ANNE SCHERER

Anne Scherer is the Chief Scientific Officer at and co-founder of Delta Labs AG, where she specializes in consumer psychology and technology. Her mission is to bridge the gap between technology and its users. Anne co-authored the book "You&AI" with Cindy Candrian, published in April of this year, a testament to her dedication to promote AI literacy and "better tech." She actively consults startups, businesses, and NGOs in their journey towards an AI-driven future, championing the concept of hybrid intelligence. Anne served as a Global Future Council for the World Economic Forum, and her influential TEDxTalk on why we are more honest with machines has reached over 1.8 million viewers worldwide. Before starting Delta Labs, Anne was an Assistant Professor at the University of Zurich, carried out research at ETH Zurich and earned her PhD with distinction from the Technical University of Munich. Away from work, she loves to pole dance, kite-surf and backpack around the world.

SESSION V:
INTERNET INTERVENTION & INTERNET ADDICTION

1. Using chatbots on Meta's Messenger to deliver internet interventions for improving well-being. Insights from studies on Stressbot and Hapibot
Jan Maciejewski, Magdalena Leśnierowska, Ewelina Smoktunowicz
(SWPS University, Warszawa)

2. Development of a mobile application-based ecological momentary intervention – an example of intervention reducing experiential avoidance in maladaptive repetitive negative thinking
Steven Barnes et. al.
(SWPS University, Katowice, Polish-Japanese Academy of Information Technology, Warsaw)

3. The Future starts now: The new approach to e-addiction prevention
Anna Wojtkowska, Katarzyna Kulwicka, Jakub Kuś, Agata Gąsiorowska
(SWPS University Wrocław)

Using chatbots on Meta's Messenger to deliver internet interventions for improving well-being. Insights from studies on Stressbot and Hapibot

JAN MACIEJEWSKI, MAGDALENA LEŚNIEROWSKA, EWELINA SMOKTUNOWICZ (SWPS UNIVERSITY, WARSAW)

Psychological interventions delivered through apps and websites are effective; however, they frequently suffer from low uptake, adherence, and retention rates, potentially undermining their efficacy. These issues may be attributed to the high effort individuals encounter when attempting to access and utilize applications designed for conveying such programs. The effort may arise from poor user interfaces or the need to acquire and use an additional app.

In response to these challenges, popular social media platforms offer a promising alternative for delivering psychological internet interventions, as they are already installed and used by people on a daily basis. We employed a popular social media messaging app, Meta's Messenger, to administer two chatbot-based interventions: Stressbot, aimed at reducing stress among university students, and Hapibot, designed to enhance well-being in the general population. We conducted qualitative and quantitative studies involving university students and the general population (N = 705). We delve into considerations for the development and testing of Meta's Messenger-based interventions, as well as report on their efficacy, adherence rates, and user feedback.

While the advantages of using a combination of social media messaging app and a chatbot interface for intervention delivery include ease of use, accessibility, and higher adherence rates compared to similar internet-based interventions, it is essential to carefully consider major disadvantages, such as user privacy risks, engagement challenges, and scalability issues.

Development of a mobile application-based ecological momentary intervention – an example of intervention reducing experiential avoidance in maladaptive repetitive negative thinking

STEVEN BARNES ET. AL. (SWPS UNIVERSITY, KATOWICE, POLISH-JAPANESE ACADEMY OF INFORMATION TECHNOLOGY, WARSAW)

mHealth applications offer on-demand, scalable provision of validated models of care capable of overcoming barriers to mental health treatment (Price et al., 2014). Ecological momentary intervention (EMI) delivers treatment in natural settings (Heron & Smith, 2010), allowing for personalisation of healthcare provision to individual user requirements in real-time via ubiquitous devices.

While EMI protocols show promise across a range of conditions (Versluis et al., 2016), uptake and engagement with mHealth tools generally is negatively impacted by issues concerning app design, content suitability, or content delivery in circumstances unsuited to user needs (Mohr et al., 2017). Effective multidisciplinary collaboration in app development, incorporating users' intricate needs, is essential to improving end-product acceptability, usability and accessibility (Bidargaddi et al., 2020), particularly in unsupervised delivery contexts (Ben-Zeev et al., 2014).

The proposed presentation outlines the conceptualisation, protocol for user-testing, and development strategy for an EMI application for rumination (i.e. a transdiagnostic process present across numerous psychological disorders involving repetitive negative thinking perceived to be difficult to control (Ehring & Watkins, 2008; Watkins & Roberts, 2020; Watkins, 2008). While many mechanisms underpinning rumination have received empirical validation, experiential avoidance (EA) lacks convincing support, despite a strong theoretical basis, partly due to challenges in empirically assessing EA in ecologically valid contexts. One such path may involve reducing EA through EMI (Balaskas et al., 2021), examining any resulting reduction of deleterious outcomes of rumination. Rumination-Focused Cognitive Behavioural Therapy (RFCBT) is a proven rumination intervention (Watkins et al., 2009), including when delivered digitally (iRFCBT) (Topper et al., 2017).

The project was undertaken by a multidisciplinary team of academic researchers, active practitioners, prospective end-users, and professional developers. Supplementary to the above specific project, we share additional insights from our wider work for effective multidisciplinary practice and user-engagement in the design of digital health protocols to improve accessibility and engagement.

The Future starts now:
The new approach to e-addiction prevention

ANNA WOJTKOWSKA, KATARZYNA KULWICKA, JAKUB KUŚ, AGATA GĄSIOROWSKA
(SWPS UNIVERSITY, WROCŁAW)

Living in a rapidly digitizing society, despite obvious opportunities, brings also some threats to which the youngest technology users are particularly vulnerable. The growing cybernetisation is inextricably linked to the growing number of children and adolescents with the symptoms of problematic internet use - more than every third teenager is already at high risk of cyber addiction development.

The first 25 years of research on the addictive impact of new technologies concluded by a need to change the approach to cyber addiction prevention to make it more relevant to current time. So far, prevention has been based mainly on limiting the screen time and supporting parental control of online activities. Nowadays more attention is paid to long-term empowerment of global ability to use the new technologies in a safe, constructive and responsible way as well as strengthening the digital resilience to reduce addiction risk in an increasingly digital society.

The aim of our presentation is to discuss a new approach to e-addiction prevention and further research directions in the light of chosen results of own research: the battery of normalized screening tests to quick and multidimensional assessment of cyber addiction risk among children and adolescents aged 0-19 (N=6525), structural model of e-media overusing predictors among youths aged 7-14 (N=1878) and experimental verification of two models of protective intervention for families with primary school students (N=300). We also aim to emphasize the need for interdisciplinary cooperation and joint efforts to protect future generations from the negative effects of digital revolution without excluding them from the use of new technologies and to support their self-development and bio-psycho-social well-being.

KEYNOTE:
HOW DELEGATING TO AI CAN WEAKEN SOCIAL TIES AND ENCOURAGE UNETHICAL BEHAVIOR

JONATHAN GRATCH
(UNIVERSITY OF SOUTHERN CALIFORNIA, USA)

Advances in artificial intelligence (AI) enable new ways of exercising and experiencing power by automating interpersonal tasks such as interviewing and hiring workers, managing and evaluating work, setting compensation, and negotiating deals. As these techniques become more sophisticated, they increasingly support personalization where users can "tell" their AI assistants not only what to do, but how to do it: in effect, dictating the ethical values that govern the assistant's behavior.

Importantly, these new forms of power could bypass existing social and regulatory checks on unethical behavior by introducing a new agent into the equation. Organization research suggests that acting through human agents (i.e., the problem of indirect agency) can undermine ethical forecasting such that actors believe they are acting ethically, yet a) show less benevolence for the recipients of their power, b) receive less blame for ethical lapses, and c) anticipate less retribution for unethical behavior. In this talk, I will review a series of studies illustrating how, across a wide range of social tasks, people may behave less ethically and be more willing to deceive when acting through AI agents. I conclude by examining boundary conditions and discussing potential directions for future research.

JONATHAN GRATCH

Jonathan Gratch is a Research Full Professor of Computer Science and Psychology at the University of Southern California (USC) and Director for Virtual Human Research at USC's Institute for Creative Technologies. He completed his Ph.D. in Computer Science at the University of Illinois in Urbana-Champaign in 1995.

Dr. Gratch's research focuses on computational models of human cognitive and social processes, especially emotion, and explores these models' potential to advance psychological theory and shape human-machine interaction. He is the founding Editor-in-Chief (retired) of IEEE's Transactions on Affective Computing, Associate Editor for Affective Science and the Journal of Autonomous Agents and Multiagent Systems, and former President of the Association for the Advancement of Affective Computing (AAAC). He is a Fellow of AAAI, AAAC, and the Cognitive Science Society.

SESSION VI:
AI IN PRACTICE – OPPORTUNITIES AND CHALLENGES

1. A reliable and accurate predictive system that can provide early warning and enable proactive measures to enhance road safety
Artur Budzyński (Silesian University of Technology)

2. Techno-empowerment – when technology becomes a decision maker
Artur Modliński (University of Łódź)

3. The impact of self-interest on moral perceptions of AI and human decisions
Katarzyna Miazek & Konrad Bocian
(SWPS University, Sopot)

4. A new method of implementing formally verifiable artificial intelligence
Krystian Dylewski (Consumer Intelligence)

A reliable and accurate predictive system that can provide early warning and enable proactive measures to enhance road safety

ARTUR BUDZYŃSKI
(SILESIAN UNIVERSITY OF TECHNOLOGY)

Road accidents continue to be a significant global concern, leading to loss of life, economic burden, and societal disruption. To address this challenge, our research project focuses on the development of a machine learning model to predict the occurrence of road accidents. The primary objective of our study is to create a reliable and accurate predictive system that can provide early warning and enable proactive measures to enhance road safety. Our methodology involves the utilization of a comprehensive dataset containing historical accident records, road infrastructure details, traffic patterns, and other relevant variables. Machine learning techniques are applied to analyze the dataset and construct a robust prediction model. Key components of our research include:

Data Preprocessing: We conduct rigorous data preprocessing to clean and standardize the dataset, ensuring the quality and consistency of the input data.

Feature Selection: We employ advanced feature selection techniques to identify the most influential factors contributing to road accidents. This enables us to focus on the most relevant predictors.

Model Training: We develop and train a machine learning model that takes into account the temporal and spatial dimensions of accident occurrence, allowing for accurate predictions.

Evaluation and Validation: Our model is rigorously evaluated using cross-validation, and its performance is assessed through metrics such as accuracy, precision, recall, and F1-score.

Real-world Application: We explore the potential practical applications of our model in real-time traffic management and accident prevention. Preliminary results indicate that our model demonstrates significant promise in accurately predicting the likelihood of road accidents. By providing a valuable tool for traffic authorities and law enforcement agencies, our model can facilitate early intervention and the implementation of targeted safety measures.

The research presented in this abstract represents a crucial step toward harnessing machine learning to improve road safety. We believe our model has the potential to reduce accident rates and their associated societal costs. We look forward to sharing the full details of our findings, including model performance and real-world applications, at the conference.

Techno-empowerment – when technology becomes a decision maker

ARTUR MODLIŃSKI
(UNIVERSITY OF ŁÓDŹ)

Techno-empowerment is understood as both the influence of technology on the decisions made by employees and consumers and giving such technology a certain degree of decision-making autonomy, both consciously and unconsciously. There are already autonomous and semi-autonomous systems that use artificial intelligence to invest money, drive cars, and serve as personal assistants. The academy is currently considering who is more willing to transfer decision-making autonomy to technology and under what conditions.

During the presentation I will present the results of my own research (in the form of two experiments), which partially fills in the aforementioned research gap. First of all, the results of my research show that there are differences between women and men in terms of attitudes and intentions towards autonomous technologies. Female users are more cautious, expecting a security certificate from the technology. In addition, they are more likely to agree to delegate decision-making autonomy if the country of origin of the technology is not known. For men, neither origin nor security certification play a role in the process of delegation of decision-making autonomy. Secondly, it was noted that religiosity affects the attitudes and trust of consumers towards autonomous cars, which may be related to the issue of perceiving roles and identities that shape the status of the consumer in the community. High (Catholic) religious men have more negative attitudes and less trust in self-driving cars than low religious men. In addition, men with a high level of religiosity have more negative attitudes and less confidence in this technology than women with a similar level of religiosity.

The impact of self-interest on moral perceptions of AI and human decisions

KATARZYNA MIAZEK & KONRAD BOCIAN
(SWPS UNIVERSITY, SOPOT)

Research on self-interest bias showed that people are more likely to perceive transgressions as less immoral if they benefit from them due to increased liking towards the transgressor. But what if a transgressor is AI, and what if people benefit from its decision? Would self-interest bias moral perceptions of AI the same as humans? Across three studies (N = 1878), we demonstrated that self-interest biases the moral perception of AI and humans. Specifically, participants perceived an unfair decision that benefited them (vs. someone else) as more moral, fair, and just (Studies 1 & 2) or a fair decision that did not benefit them (Study 3). We found that self-interest bias was weaker for AI than for humans, which was explained by the mind perception and liking. Finally, we did not find evidence that biased moral character judgments impacted trust toward AI or humans. These results indicate that AI's unfair decisions are judged more objectively than humans, even if the outcome benefits the decision-makers. However, they also suggest that people may be more critical in their moral judgments of AI than humans due to the former's lack of a full mind.

A new method of implementing formally verifiable artificial intelligence

KRYSTIAN DYLEWSKI
(CONSUMER INTELLIGENCE)

Current research on artificial intelligence is dominated by deep neural networks, in particular the so-called Large Language Models (LLM) operating on tens of billions of parameters. There are known problems in using these algorithms. They include, among others: completely incorrect answers - the so-called "hallucinations" that cannot be predicted and easily corrected due to the closed and extremely complex analytical nature of deep neural networks - the so-called "black box". Another problem is the very high costs of resources and energy consumed by supercomputers to train these algorithms and answer users' questions.

At the same time, the "hallucinations" of deep neural networks remain very reliable and, according to experts, are a threat to users due to misleading them, and in particular disqualify the use of current AI in autonomous applications, among others in areas such as law, medicine and autonomous vehicles. There are many known cases of completely inexplicable movements of autonomous cars, which are often a hazard on the road.

The team is investigating a completely new method of implementing artificial intelligence based on the network connection of millions of known and formally documented heuristics, which solve partial subproblems in a much more optimal and effective way than deep neural networks. To obtain a global solution that is a non-linear network connection of existing heuristics, the team uses optimization using genetic algorithms and effective gradient methods.

The team's research shows that the method used can be an alternative to deep neural networks, and in particular LLM, demonstrating full explainability of the answers, formalism of the results resulting in their complete correctness, as well as thousands of times lower cost of use compared to existing solutions.

POSTER SESSION

1. Ready or Not? Acceptance And Fears Towards Robots in Polish society
Kacper Sawicki, Karol Samson, Konrad Maj

2. Scary just like the Terminator? The Corpus of Speech About Robots (COSAR) study of Sci-Fi references and attitudes towards real social robots
Aleksandra Wasielewska, Paweł Łupkowski

3. Exploring the Influence of Dominant and Submissive Postures on Robot Perception Dawid Ratajczyk

4. Graphene-Based Electronic Skin Integration with Robotic Manipulator: Calibration Using Neural Network Models for Enhanced Human-Machine Interaction Jan Klimaszewski, Jakub Możaryn, Krzysztof Wildner

5. Human-AI Interaction: How to Design Intuitive and Useful AI-Based Products?
Agata Antoniak

6. The use of eye-tracking in measuring the visual attention distribution of tram drivers during training on tram simulators as an application of modern technology in improving tram driver training Anna Warchoł - Jakubowska

7. Full-body illusion in virtual reality: study replication using modern VR equipment Milena Celebudzka, Krzysztof Wesołek, Remigiusz Depta

1. Ready or Not? Acceptance And Fears Towards Robots in Polish society

KACPER SAWICKI, KAROL SAMSON, KONRAD MAJ (SWPS UNIVERSITY)

The presented study aimed to examine attitudes towards robots in a Polish sample (N = 1044). Based on previous research, higher concerns toward and lower acceptance of robots were predicted for women, people performing manual and manual work, and people who are not familiar with robotics. The hypotheses were only partially confirmed. Orientation in the field of robotics is conducive to greater acceptance of the presence of robots in trust works professions. Unexpectedly, it turned out that people who declared performing physical work, compared to people performing other types of tasks, have a more affir-mative attitude to the participation of robots in customer service occupations and to accept the autonomy of the robot to a higher degree.

The results also showed that women are more concerned about the increased presence of robots in the labour market, and less accepting of the replacement of humans by robots and the greater autonomy of intelligent machines. In addition, the analysis revealed that people with more knowledge in the field of robotics declare greater acceptance of autonomous work of robots and in terms of replacing people with ro- bots in the work environment, they also have less concerns about the market situation compared to those who do not consider themselves knowledgeable in this area. The data obtained may be helpful in constructing programs in the field of knowledge about robotics in Poland.

2. Scary just like the Terminator? The Corpus of Speech About Robots (COSAR) study of Sci-Fi references and attitudes towards real social robots

ALEKSANDRA WASIELEWSKA, PAWEŁ ŁUPKOWSKI
(ADAM MICKIEWICZ UNIVERSITY, POZNAŃ)

There are studies suggesting that the attitudes towards really existing robots are somehow related to the image presented by Sci-Fi (see e.g. Bruckenberger et al. 2013). As such an image constitutes an important factor for HRI studies. In this talk we present the COSAR study concerning Sci-Fi references and attitudes towards social robots. COSAR is a manually annotated corpus that includes people's attitudes toward real social robots, as well as references to science fiction media, and fictional robot characters. Data for COSAR was retrieved from YouTube comments on videos presenting 16 different, really existing social robots. The tagset of COSAR reflects: the cognitive component of attitudes (people's thoughts, beliefs about a robot and cognitive evaluations of a robot), the affective component (feelings or emotions toward/about a robot) and the behavioral one (behavioral intentions or actual behavior toward a robot). The tagset also covers references to fictional robot characters and science fiction media. The study addresses the following questions. Do people compare really existing robots to those presented in Sci-Fi? What are the most popular references? Is there a relation with the valence of these references and the attitudes observed for really existing social robots?

3. Exploring the Influence of Dominant and Submissive Postures on Robot Perception

DAWID RATAJCZYK
(ADAM MICKIEWICZ UNIVERSITY, POZNAŃ)

The uncanny valley hypothesis (UVH) suggests that artificial characters resembling humans to a certain extent, but not entirely, tend to evoke feelings of eeriness or discomfort among observers. This effect is often associated with artificial agents, and it also encompasses concerns about the fear of revolt among robotic servants, considering that the term 'robot' is rooted in the concepts of work and service.

Previous research has revealed that, akin to primates, humans tend to avert their gaze from individuals displaying dominance as opposed to those displaying submissiveness (Holland et al., 2017). Moreover, studies have shown that dominant robots are often perceived more negatively than dominant humans (Hou et al., 2023; Li et al., 2015). This is partly because people generally expect robots to exhibit submissive behaviors. When dominant robots defy these expectations in their interactions, they may be perceived as more threatening. It remains uncertain how the spectrum of human likeness, in conjunction with displayed dominance, influences feelings of threat, likability, and eeriness.

To address this question, the study aims to investigate whether dominant robots are perceived more negatively than more human-like dominant robots. The study was conducted using movie clips featuring both dominant and submissive realistic 3D characters with varying degrees of human likeness. These characters were morphed along a continuum between robot-like and human-like appearances. Dominant characters were characterized by open postures and direct eye contact with the camera, while submissive characters assumed closed postures and mostly averted their gaze below the camera. A manipulation check was performed to confirm that our conditions effectively differed in perceived dominance. The results to be presented will be based on the responses of 332 participants who took part in an online survey.

4. Graphene-Based Electronic Skin Integration with Robotic Manipulator: Calibration Using Neural Network Models for Enhanced Human-Machine Interaction

JAN KLIMASZEWSKI, JAKUB MOŻARYN, KRZYSZTOF WILDNER (WARSAW UNIVERSITY OF TECHNOLOGY)

In the context of Industry 4.0, collaborative robots play a crucial role in safely working alongside humans within a shared workspace, thanks to advancements in sensors. Enhancing the safety of these robots, this research presents a comprehensive framework encompassing both hardware and software aspects for newly developed electronic skin based on graphene. This electronic skin integrates seamlessly with the robot's control system, as confirmed by functional laboratory tests. The research further delves into the calibration of this graphene-based electronic skin, specifically designed for robotic applications involving screen-printed graphene-based sensors. A precise mathematical model is required to estimate touch pressure accurately due to non-homogeneous parameters and observable hysteresis in touch force characteristics. The research introduces a novel approach using a recurrent neural network model for calibration, offering a simpler alternative to existing models in the literature.

5. Human-AI Interaction: How to Design Intuitive and Useful AI-Based Products?

AGATA ANTONIAK (SWPS UNIVERSITY)

User Experience (UX) is a critical element in the design and development of digital products. For years, the application of established usability heuristics and design standards has been a sufficient foundation for creating useful, intuitive, and user-friendly products. However, in the face of the dynamic growth of artificial intelligence (AI) and its role in digital products, we are encountering new challenges. As products rely increasingly on AI, the way people interact with technology is changing.

Research conducted by the Norman Nielsen Group has shown that new user behaviors are emerging, behaviors that did not exist before. Importantly, people have diverse perceptions and expectations regarding how AI functions. This is well illustrated by the following quote: "Artificial intelligence (AI) is a mystery and a wonder. It can help us solve humanity's most difficult problems. AI is also vastly misunderstood by most people. For some, AI is a magical black box with the intelligence of a PhD. It knows all about everything, you just bring your problems and, voilà, your problems are solved. For others, fears of AI uprisings, loss of human control, and Terminator-like scenarios cloud their capability to understand the present utility of cognitive computing."

This poster will provide an overview of selected academic studies on the relationship between humans and AI. It will also include a compilation of design recommendations developed by teams from companies such as Google, IBM, and Microsoft. The guidelines cover topics like the significance of users' mental models and building trust in AI systems. The conducted analysis will serve as the foundation for my further research at the intersection of human-computer interaction (HCI), AI, and psychology.

6. The use of eye-tracking in measuring the visual attention distribution of tram drivers during training on tram simulators as an application of modern technology in improving tram driver training

ANNA WARCHOŁ - JAKUBOWSKA
(SWPS UNIVERSITY)

This poster presents the use of eye-tracking in measuring the visual attention distribution of tram drivers during training on tram simulators as an application of modern technology in improving tram driver training.

Fifty-seven participants in two groups (30 experts and 27 novices) were invited to take part in an experiment of driving tram driving simulations. Visual attention was collected using the Pupil invisible mobile eye tracker. To explore differences in visual attention of tram drivers of different expertise various methods of eye-tracking data aggregation were implemented. Ten Areas-of-Interests (AOI) were defined for the tram driver view: the windshields (left-side vs. middle vs. right-side), control panel (left-side vs. middle vs. right-side), and four rear-view mirrors. Total fixation duration on specific AOIs throughout the study was calculated for both groups. The results show between-group differences in attention dynamics. Additionally more advanced methods of eye tracking data analysis, such as ambient/focal attention K coefficient, defined as the relation between the current fixation duration and the subsequent saccade amplitude were considered.

The studies are the first step in designing gaze-based training for novice tram drivers using eye-tracking measurement of the trainee's visual attention in real time during training sessions in a tram driving simulator. Combining the possibilities offered by the simulator with the experience of eye-tracking research creates a completely innovative approach to training tram driver candidates.

7. Full-body illusion in virtual reality: study replication using modern VR equipment

MILENA CELEBUDZKA, KRZYSZTOF WESOŁEK,
REMIGIUSZ DEPTA
(NICOLAUS COPERNICUS UNIVERSITY, TORUŃ)

In the study we are conducting, we focus on the phenomenon of the full-body illusion, which is related to the multisensory integration of external and internal body senses. We base our approach on the Video Ergo Sum research paradigm (Lenggenhager, Metzinger, Blanke, 2007) and the Multidimensional Assessment of Interoceptive Awareness (MAIA) scale (Mechling et al., 2018). The study aims to determine whether a high level of interoceptive awareness can influence the strength of the illusion. We also want to check if there is a difference between conditions using a virtual avatar and a mannequin in the real world. The study involves inducing an illusory out-of-body sensation through multisensory conflict. This conflict is induced by observing one's own back (or the back of a mannequin or avatar) in VR goggles while simultaneously feeling a touch on the back. This process is repeated in four different conditions. In the study, we use more modern equipment than in the original study, which may translate into increased immersion and have an impact on a stronger illusion. The results of the study may be important for the development of knowledge about bodily awareness, interoception, and neuropsychological disorders of the body.

8. Use of Virtual Reality (VR) in the Rehabilitation of Post-Stroke Patients

KATARZYNA MATYS-POPIELSKA, KRZYSZTOF POPIELSKI,
ANNA SIBILSKA-MROZIEWICZ
(WARSAW UNIVERSITY OF TECHNOLOGY)

Stroke, occurring in Poland on average every 3 minutes, is a sudden interruption of blood flow to a part of the brain leading to the damage or death of nerve cells, which can result in persistent motor, speech, or memory impairments in the patient. The use of Virtual Reality (VR) applications in the rehabilitation of post-stroke patients can bring significant benefits in terms of improving motor functions, balance, and cognitive functions. Personalized scenarios and exercises tailored to the patient's needs can increase motivation for exercises, reduce the therapist's workload, and accelerate the recovery process.

The purpose of this presentation is to showcase VR applications developed within the "Virtual Reality Game for Rehabilitation of People with Paresis and Neglect Syndrome" project. As part of the project, 4 game prototypes were created targeting patents with various neurological complications, including neglect syndrome, arm paresis, and aphasia.

9. Development of a Method for Designing and Manufacturing Forearm Orthoses Using 3D Printing Technology

ANDRZEJ ZAKRĘCKI
(AGH UNIVERSITY, KRAKÓW)

The process of designing a forearm orthosis requires the designer to have knowledge in the field of forearm injuries, CAD design techniques, and manufacturing technologies, including 3D printing. In this paper, a method for designing forearm orthoses using HP MultiJet Fusion (HP MJF) and Selective Laser Sintering (SLS) technologies was developed. The paper presents the application of 3D scanning technology based on the 3D Structure Sensor Pro scanner to prepare a virtual model of the forearm for orthosis design. A comprehensive analysis of the polyamide PA12 material, from which the orthosis was designed, was conducted. Tensile and bending tests were performed, and measurements of roughness and hardness were taken. Data related to the orthosis design process were prepared based on the anatomy of forearm injuries and the positioning of the forearm hand, including the adjustment system. A design scheme for the orthosis was developed based on size groupings. A strength analysis of the orthosis was carried out.

Orthoses were produced using HP MJF and SLS technologies, and finishing was done using DyeMansion finishing methods. The final solution is a forearm orthosis with an adjustment system. This paper describes the process of designing a forearm orthosis using 3D printing from conceptual work to the production of the final product by developing a series of forearm orthoses in four size groups for the treatment of forearm injuries. Additionally, a Technology Readiness Level (TRL) VII was achieved for all developed medical products, and they were introduced to the medical market along with testing among early technology users.

10. Compare the collected results of managerial competence assessments using 180-degree methods and VRDC

KONRAD URBAŃSKI

The aim of the research was to compare the collected results of managerial competence assessments using 180-degree methods and VRDC (Virtual Reality Development Center) among Polish micro, small and medium-sized enterprises.

VRDC is a new methodology for developing competences using VR (Virtual Reality) technology. The author (Prof. KU dr hab. Anna K. Baczyńska) proposes the use of simulations in the VR space as an alternative place to collect research material, five universal managerial competencies: Work and team management, decision-making, result orientation, cooperation and social skills, change management. It assumes that graphic stimuli result in the creation of a significant level of immersion among respondents, which translates into a higher level of involvement and disclosure of their behavior.

The work delves into contemporary problems of AC/DC (assessment center/development center) methods and the benefits of supporting tools used in the process. The author traces the relationship between the two methodologies by examining the correlation of the obtained results on behavioral levels. The considerations lead to the conclusion that the VRDC methodology is a promising tool that allows you to overcome previously unbreakable barriers to the analysis of human behavior, providing an alternative and more user-friendly experience. The study was conducted in cooperation with GuideMe Sp. z o. o.

11. Application of Artificial Intelligence (AI) in Acoustics: Enhancing Sound Environments in Buildings and Performance Spaces

ADAM STAROWICZ, MARCIN ZIELIŃSKI
(UNIVERSITY OF WARMIA AND MAZURY, OLSZTYN)

The convergence of artificial intelligence (AI) and acoustics represents a transformative leap in pursuing optimized sound environments within buildings and performance spaces. This article comprehensively explores AI's multifaceted role in reshaping the world of acoustics. By harnessing AI-driven techniques, the endeavor to create acoustically superior spaces is evolving from a traditional art form into a precision-driven science.

This review delves into several vital domains where AI is profoundly impacting. First, the utilization of AI in room acoustics design is examined, elucidating how AI algorithms analyze architectural parameters and materials to achieve ideal sound properties. Furthermore, AI's role in noise reduction and control is scrutinized, shedding light on its capacity to mitigate unwanted sounds and enhance auditory clarity.

The article extends its focus to the application of AI in improving speech intelligibility in noisy settings, with particular emphasis on its relevance in modern workplace environments. Additionally, it explores how AI facilitates environmental noise monitoring, offering invaluable insights into urban planning and noise pollution mitigation. AI's predictive modeling capabilities for acoustic simulations and its potential for creating personalized sound experiences are also elucidated.

Through an array of case studies and examples, this article underscores AI's transformative influence on the acoustic landscape, benefiting not only architectural design but also the quality of human experiences within these spaces.

It concludes with a forward looking perspective on the continued evolution of AI in acoustics, providing insights into future innovations and the potential for AI to reshape our sonic surroundings. This work serves as a comprehensive resource for researchers, engineers, architects, and acousticians seeking to harness the power of AI to create enhanced soundscapes and elevate the auditory experience in diverse settings.

12. Both human and tech – DAOs as a new approach to financial services

TOMASZ WIĄCEK (DOCTORAL SCHOOL OF SOCIAL SCIENCES, ŁÓDŹ UNIVERSITY)

The impact of information technology on social life in the last decades has been exponential. One of the emerging technologies in this field is blockchain.

From a technical perspective, blockchain is distributed ledger, operating as a network of devices instead of one central server. The state of data recorded in the ledger is agreed using protocol of consensus, that requires approval of the majority. Once agreed, records are virtually immutable. Blockchains are secured by cryptography and asymmetric hashing. From a philosophical perspective, blockchain technology proponents view it as an answer to the crisis of trust in traditional intermediaries, e.g. state authorities and financial institutions. Blockchain is praised for enabling "trustless" interactions, where computer code replaces trusted third parties.

A prominent use of blockchain is decentralized autonomous organization (DAO). This phenomenon can be described as a new way of organizing social life. A group of people, notably anonymous to one another, may agree to transfer their assets to a special kind of software called "smart contracts", run on a blockchain. The algorithms of software, which may qualify as artificial intelligence, automatically use the assets transferred by the members in a way prescribed by the rules of their underlying computer code. In all matters provided for in the code, the members of DAO may decide in voting, using dedicated cryptographic tokens.

From the legal point of view, DAOs are a revolutionary concept. They allow the end-users of many traditional financial services to collaborate in a way that excludes the intermediary, like a bank granting loans or an exchange provider. Those consumers organize thanks to the blockchain-ran software, benefitting from cutting out transaction costs of the middle man. Thus, DAOs are a cutting-edge use of information technology.

The hypothesis that this paper argues for is that DAOs can provide regulated financial services to their members outside of regulatory control, due to the lack of an entity-provider. Such a revolutionary way of providing financial services brings about benefits and threats alike, which are both described and analyzed in the paper

13. A novel approach to explaining visual predictive models using diffusion models

BARTŁOMIEJ SOBIESKI

Diffusion models are the latest revolution in the domain of generative modelling in computer vision with their unprecedented image quality, training stability and solid theoretical properties. Thanks to their flexibility, many new applications have been found that were not previously possible with the use of generative approaches. Recently, they have proven useful as a tool for explaining visual predictive models in the field of explainable artificial intelligence - a growing research domain with a goal of developing tools for understanding and explaining the decisions of machine learning methods. As visual models continue to evolve and grow in complexity, providing new methods that improve the explanation of their inner workings is critical to ensuring their safe and responsible use.

Our work proposes a novel approach to explaining visual predictive models using diffusion models. We utilize the Diffusion Autoencoders framework and show that the semantic part of its latent space can be optimized to fulfill specific constraints. Concretely, we propose a combination of visual classifier's logit and perceptual similarity to optimize for the generation of counterfactual explanations (CEs) – for visual models, this type of explanation aims to modify the image in a minimally semantic way so that the model's prediction is flipped (e.g., from male to female). Therefore, CEs provide an intuitive way to explain the decision-making process of the model.

We propose multiple strategies for performing such optimization using proxy lightweight approximators. The unique property of our approach is that optimizing for CEs can also benefit the task of synthetic image generation – solving this optimization problem provides a strong supervisory signal which allows for the discovery of new meaningful semantic directions in the latent space. We perform extensive experiments on two popular CEs benchmarks (FFHQ, CelebA) to verify the performance of our approach.

14. Exploring Futures of Infinite Memory through Speculative Design

AGNIESZKA DUTKOWSKA-ŻUK
(LANCASTER UNIVERSITY, UK)

"The Future is Now" is a message lurking on every corner. Rightly so, as we live in a world where new technological developments spring up like mushrooms. The future happens quickly, and we rarely have a chance to grasp what different visions of the technological future bring before they are materialized. One may be under the impression that the future happens to us.

Speculative Design is a research practice that helps us explore different future scenarios, understand them and, therefore, shape them. I will give an example of this from my research on future scenarios in which we will be able to store everything. The mental model of memory that has been projected into the digital space design is that one remembers by acquiring data and forgets by deleting it. This linear memory model suggests a one-way dynamic from remembering to forgetting. I will discuss a possible paradigm shift: how forgetting a memory can help remembering in longer terms by presenting a speculative design artefact, the Horcrux Ear. It was created using a Research through Design approach that develops a new understanding of these processes' temporality and spatial dimension of memory.

My poster aims to contribute to the debate over the relationship between forgetting and remembering, its role in the infinite data scenario, and the future relationship between human and computer memory.

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