

UNIVERSITY OF TWENTE.



IHCI 2024

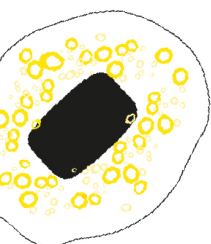
Meaningful Computer Interaction

Conference Report

16th International Conference on Intelligent Human Computer Interaction

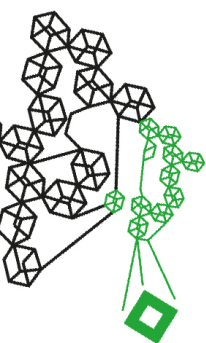
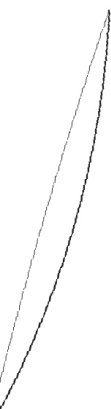
12 – 15 November 2024

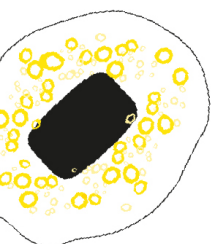
THE BMS LAB
Faculty of Behavioural, Management and Social Sciences
University of Twente, The Netherlands
<https://www.utwente.nl/en/bms/ihci2024>



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Welcome Message

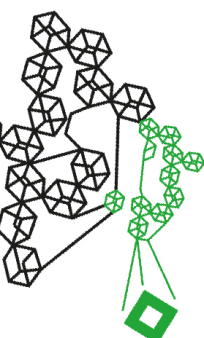
The 16th edition of the international intelligent human computer interaction conference (IHCI) takes place from 13-16 November, 2024, at the University of Twente in The Netherlands. It is organized by its Behavioural, Management and Social Sciences (BMS) faculty' innovation lab -- BMS Lab -- in partnership with the IHCI Society.

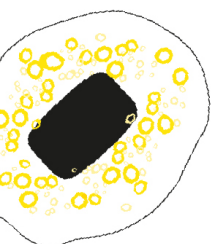
This edition's theme emphasizes a crucial aspect of intelligent HCI: *meaningful interaction*. This theme resonates with societal challenges and therefore an important research focus in Twente. At the same time, this theme also conveys the message that for HCI to succeed, impact and meaning in society are crucial. As such, studying, developing, implementing and evaluating intelligent HCI is a multidisciplinary undertaking with anchor points and contributions from many disciplines. We are happy to bring these disciplines together.

The 2024 conference underlines meaningful interaction through its keynote topics and its topic structure. Keynote presentations have been selected on reliable and valid Data Science; Physiological synchrony; Digital health and the importance of regulation for implementation; and motivated Trust in AI. Invited talks introduce topics sessions, and include Human Factors, VR simulation in Clinical Setting, Privacy, and Neuromarketing. Also an industrial perspective on human factors is programmed, thanks to UT strategic partner Thales. On the last social event day, a different light is shed on the IHCI community, through a visit to the Amsterdam Light Festival.

BMS Lab takes pride in being the 2024 venue to discuss and inspire our IHCI community, having established a cutting edge, multifaceted and high quality programme. We thank all contributors for being a part of it.

*Jan-Willem van 't Klooster
Teodora Spirova
IHCI 2024 conference organisers*





Preface

Dear Esteemed Participants,

Welcome to IHCI 2024, the annual International Conference on Intelligent Human-Computer Interaction!

With great pleasure, we invite you to join us in this exceptional gathering of researchers, educators, and young professionals from around the world.

Since its establishment in 2008, the Intelligent Human-Computer Interaction (IHCI) society has been dedicated to advancing human-centered technology, cognitive computing, and humanities studies. Our mission is to foster innovation and collaboration through research and experimental development initiatives. And this year, our conference is powered by the theme of "**Meaningful HCI**," exploring the exciting intersection of artificial intelligence and human-computer interaction.

IHCI 2024 serves as a vibrant platform for the presentation of cutting-edge research results and technological advancements. Engineers and scientists from various disciplines, including artificial intelligence, signal processing, computer vision, and human-computer interaction, will converge to share their insights, collaborate, and push the boundaries of knowledge. This unique blend of expertise creates an environment where theoretical, practical, and applicational aspects of the field can be explored, leading to groundbreaking discoveries and innovations.

As the foremost worldwide gathering in the field, IHCI has attracted top researchers, graduate students, research think tanks, and industry technology developers. Together, we aim to tackle the emerging research challenges arising from the intricate interaction between machine intelligence and human intelligence. We believe that by participating in IHCI, you will be able to actualize your goals in HCI, leading to greater success in business and contributing to the betterment of society as a whole.

The field of Human-Computer Interaction has experienced significant progress in recent years, resulting in diverging trends. While some conferences focus on specific topics like Interaction Design and User-Centered Design, others embrace new areas such as Computing with Words, Prosocial Agents Development, and Attention-based Applications. IHCI stands apart by addressing the intelligence and human-computer interaction issues at the intersection of these trends. This holistic approach allows us to explore the forefront of research and bridge the gap between academia and industry.

By becoming a member of the IHCI society, you will gain access to the latest conferences and events conducted by our community. We aspire to be a leading community of researchers, educators, and young professionals, setting new benchmarks in research and advancing the understanding of Intelligent Human Computer Interaction and Cognitive Computing.

We look forward to your participation in IHCI 2024 and the valuable contributions you will bring to our vibrant community. Together, let's shape the future of AI-powered IHCI and create technology that enhances the human experience.

Warmest regards,

dr. ir. J.W.J.R. Van T Klooster (Jan-Willem), General Chair, IHCI 2024
prof. dr. Dhananjay Singh, Technical Program Chair, IHCI 2024



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Organisation

General chairs

dr.ir. J.W.J.R. van t Klooster (Jan-Willem)

Scientific Director BMS LAB, University of Twente

T.S. Spirova, MSc (Teodora)

Project Lead BMS LAB, University of Twente

prof. dr. Dhananjay Singh Prof.

Penn State University, USA

Steering Committee

prof.dr. T. Bondarouk (Tanya)

Dean Faculty BMS, University of Twente

dr.ir. J.W.J.R. van t Klooster (Jan-Willem)

Scientific Director BMS LAB, University of Twente

Jan Treur Prof. dr.

Dept. of Artificial Intelligence, Vrije Universiteit Amsterdam, NL

Uma Shanker Tiwary Prof. dr.

Center of Cognitive Computing IIIT-Allahabad, India

Advisory chairs

prof.dr.ir. B.P. Veldkamp (Bernard)

Full Professor, Vice-Dean Research, University of Twente

Benno Pals, PC

Operation Manager, BMS Lab

Venkatasubramanian Ganesan Prof.

Department of Psychiatry, National Institute of Mental Health & Neurosciences, Bangalore, India

Jan Treur Prof. dr.

Dept. of Artificial Intelligence, Vrije Universiteit Amsterdam, NL

Wan Young Chung Prof.

Department of Artificial Intelligence Pukyong National University, S Korea

Ajay Gupta Prof.

Department of Computer Science, Western Michigan University, Kalamazoo, USA

Programme Chair

T. Spirova MSc (Teodora)

Project Lead at The BMS Lab

TPC Coordination

Prof. dr. Dhananjay Singh (technical program chair)

Dr. ir. Jan-Willem van 't Klooster

Dr. Madhusan Singh

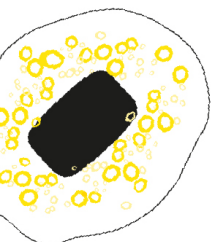
Dr. Rajeev Singh

Dr. Kim Jong-Hoon

TPC

<https://www.utwente.nl/en/bms/ihci2024/organising-committee/committee/>

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Workshop Chairs

Dr Anna Machens (Data science)
Luca Frösler BSc (Unity)
Kars Otten, MSc (Virtual Nature)
Jaap Stout, MSc (Information working&studying @UT)

Young researcher & PhD Forum

Prof. em. dr. Lisette van Gemert

Social event Chair

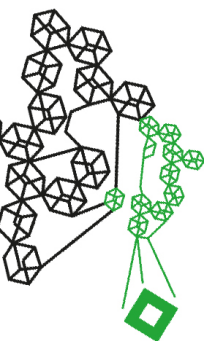
Dr. Kim Jong-Hoon
Department Computer Science, Kent State University, Kent, USA

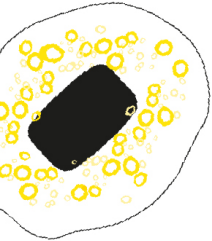
Local Organisation

Teodora Spirova
Benno Pals
Lorette Bosch
Lisa DuPlessis
Gita Ni Made Anadita Dewi
Shaunie Schutten
BMS Lab, University of Twente
Iris ten Klooster
Simone Borsci

With special thanks to

prof. Uma Shanker Tiwary, IHCI Fellow
DesignLab: DreamTeam, Nicole Wright, Kris Pals, Sabine Wildevuur
UT Video Team
DJ Luca
all session chairs





Keynotes

Wednesday 13 November 2024

Prof. dr. A.M. Brouwer (Anne-Marie)

Bijzonder hoogleraar - Artificiële intelligentie Hoogleraar - Donders Centre for Cognition
Hoogleraar - Donders Institute for Brain, Cognition and Behaviour

Are you attending? - Monitoring attentional engagement through synchrony in physiological signals

Continuous and implicit measures of individuals' attention would be useful for human computer interaction. Brain responses can tell us about individuals' level and focus of attention, but it is not straightforward to retrieve this information in real life scenarios. In this talk, I will discuss research showing that the degree to which EEG signals vary in a similar way over time between individuals is associated with attentional engagement. Our findings that this also holds for other physiological signals (heart rate and skin conductance), under various real-life or life-like circumstances, and that it predicts subsequent behavior, make interpersonal physiological synchrony a promising marker of attention for applied settings as well as ecologically valid research.

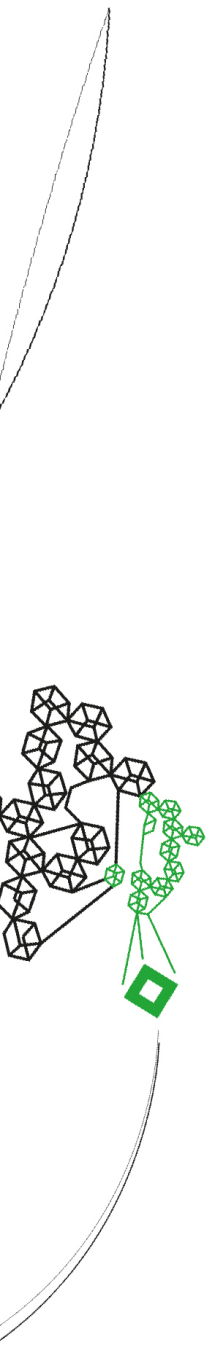
Anne-Marie Brouwer is senior scientist at TNO (Netherlands Organization for Applied Scientific Research, Soesterberg) and part-time full professor 'Mental State Monitoring' at Radboud University/Donders Centre in Nijmegen. Anne-Marie studied experimental psychology in Nijmegen and obtained her PhD on eye-hand coordination research in 2002 at the Erasmus MC in Rotterdam. Following post-docs at the Max Planck Institute in Tübingen and the University of Rochester (NY) she started working at TNO in 2007. Since 2007 her main topic of research is BCI and using brain and other physiological signals as potential sources of information about an individual's cognitive and emotional state. Anne-Marie works on basic research projects for and in collaboration with different parties, such as basic science funds, defense, and food industry. She is dedicated to explore the added value of physiological measures, connecting lab and real life studies, discuss the challenges that still exist and finding ways to cope with these.

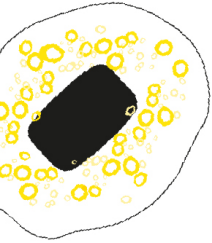
Prof.dr.ir. B.P. Veldkamp (Bernard)

Prof. Dr. Bernard Veldkamp is Vice Dean of Research at the Faculty of Behavioral, Management and Social Sciences, University of Twente, the Netherlands.

About the reliability and validity of using AI to analyze intensive longitudinal data

The availability of sensors, eye-trackers, wearables, smartwatches, or other digital devices facilitates the collection of new types of data that can be used for measurement. The question is how to analyze them. Several statistical/psychometric models are available, but even though they have been applied successfully in many testing programs, they do have their limits with respect to the kind of data they can be applied to. Artificial intelligence (AI) offers many methods for dealing with these new and more complex data sets. They do have some limitations when it comes to reliable and valid measurement thought. The question arises how to apply them in a valid way when dealing with intensive longitudinal data. To answer this question, the benefits and disadvantages of artificial intelligence are illustrated first. Then the argument-based approach to validity (Kane,) is introduced. It is illustrated how this approach can be applied in the field of AI methods for intensive longitudinal data analysis. Finally, some recommendations for designing a blueprint for a wearables validation pipeline are provided.





Prof. Dr. Bernard Veldkamp is Vice Dean of Research at the Faculty of Behavioral, Management and Social Sciences, University of Twente, the Netherlands. Dr. Veldkamp specializes in research methodology and data analytics. His interests focus on optimization, text mining, and computer-based assessment. His work spans a range of issues in educational, psychological, and health sciences, from the development of new methods/models for the design and construction of (adaptive) psychological and educational tests, to the development of data mining models for analyzing verbal data, intensive longitudinal data, or large datasets in, for example, dialy-life stress or fraud detection.

Thursday 14 November 2024

Prof. dr. Sandra Fisher

Professor of Organizational and Business Psychology, Münster University of Applied Sciences

Motivated trust in AI: Looking at technology from different perspectives

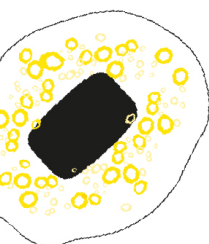
Artificial intelligence (AI) applications are currently explored in multiple fields of organizational work, seeking to exploit efficiency potentials but also bringing considerable changes in work processes and roles. For instance, AI systems can be increasingly found in typical Human Resource Management fields, such as leadership or recruiting. However, a core precondition for successful application of AI-based technologies is that involved persons place sufficient trust in these technologies, for example, by following recommendations of the AI-system, by allowing AI-technologies to access personal data, or by deciding to implement an AI system in the first place. Extant models of trust in technology fall short of considering the black box nature of AI systems. Moreover, extant models focus on rational assessments and neglect the fact that different users approach technologies with different needs and expectations. A motivational perspective is important for a conclusive understanding of trust in AI, and can explain trust differences between stakeholder groups, such as managers, employees, or HR professionals. This presentation, based on a recent publication (Hertel, Fisher & Van Fossen, 2024), introduces a new integrative model of trust in AI that considers both cognitive and motivational processes. The model enables specific predictions for different stakeholder groups across different levels of analysis (organization, team, individual). Instead of direct linkages between system features and trust, we argue that the impact of system features depends on gains and losses different stakeholders expect as a consequence of AI usage. For example, managers and HR professionals will receive and seek different information about the reliability of an AI-based recruiting system than will job applicants, leading to different assessments of the AI system. In addition to suggesting avenues for future research, the integrative model provides practical implications for building and maintaining trust in AI systems for different stakeholder groups.

Dr. Sandra Fisher is a professor of International Management focusing on digital and intercultural competencies at the Münster University of Applied Sciences in Münster, Germany. She has a PhD in Industrial-Organizational Psychology from Michigan State University. Her research focuses in three main areas: the use of contingent work, the implementation and strategic use of digital technologies in human resource management, and effective design of technology-based training. Her publications appear in top international journals such as Personnel Psychology, Journal of Applied Psychology, Human Resource Management Review and Academy of Management Discoveries. She has presented her work at a variety of international conferences. Sandy serves as Special Issue editor for the International Journal of Human Resource Management and a guest editor at Journal of Business and Psychology.

Prof. dr. Enrico Gianluca Caiani

Associate Prof. at the Electronic, Information and Bioengineering Department of Politecnico di Milano





Digital Health solutions: an intricate path to implementation through regulations and clinical acceptance

In this talk, the potentials of digital solutions for health in the current European scenario will be explored, together with the barriers to implementation perceived both from the healthcare professionals and other stakeholders involved.

In this view, the regulatory aspects relevant to software as medical device, as defined by the EU Medical Device Regulation (2017/745), and its post-market surveillance will be described, also including a view on ongoing parallel legislative initiatives, such as the AI Act and the European Health Data Space, and on path for reimbursement. Finally, an example of how ICT solutions for regulatory science could help involved stakeholders in improving transparency of medical device performances, and improve patient safety, will be presented.

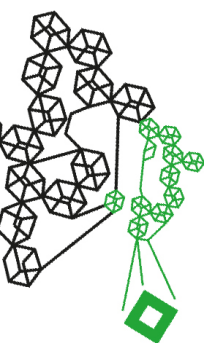
Enrico G. Caiani (MS in Electronic Eng. 1996, PhD in Biomedical Eng. 2000) is Associate professor at the Electronics, Information and Bioengineering Dpt., Politecnico di Milano, Italy. He is author of 7 book chapters, >150 papers (H-index=36, total citations>12000) and >150 conference proceeding papers. Since 2022, he is officially affiliated with IRCCS Istituto Auxologico Italiano, Ospedale San Luca, with whom he collaborates in the context of several projects.

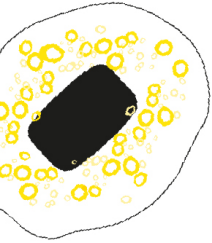
Since 2020 he is Fellow of the European Society of Cardiology (ESC), where he served as Chair of the e-Cardiology Working Group (16-18), vice-Chair of the Digital Health Committee (18-20) and is now serving as Advisor for the Regulatory Affairs Committee on Medical Devices, and as ESC representative in the EU eHealth Stakeholders Group and in the EU Medical Device Coordination Group-New technologies.

In Oct 2020 he was nominated by the Italian Space Agency (ASI) as National Expert in the Thematic Table on Integrated Physiology, and since 2023 he is member of the steering committee of the ESA_Lab@Polimi. In May 2023, he has been nominated as expert in the Technical Scientific Committee serving the Italian Inter-Parliamentary Group on "Digital Health and Digital Therapies".

Since 2019, he is member of the Board of the PhD in Data Analytics and Decision Science at Politecnico di Milano, and actually he is acting as advisor of 8 PhD students. Also, he is the responsible of the D-Hygea Lab @ Politecnico (Digital solutions for prevention).

His main research interests include digital health solutions in the field of cardiology, health geomatics, cardiac signal and image processing, space physiology, and regulatory science.





Special Sessions

Human Factors in Cybersecurity

dr. Peter Roelofsma lector and Jan Treur dr.

Risk Management & Cyber Security Group
The Hague University of Applied Sciences

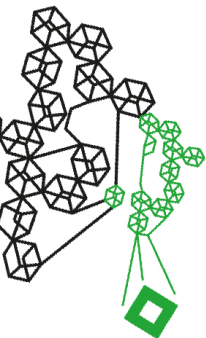
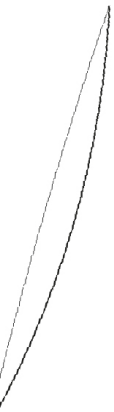
Human errors, such as biases in cyber risk judgement and decision making, falling for phishing emails, using weak passwords, or accidentally leaking data, can make a secure network vulnerable. These mistakes are not just made by junior staff; even executives and organizational decision makers can be victims. It's clear that no one is immune, making human factors a critical concern for every organization. Attackers use tactics like phishing emails, pretexting, or baiting to psychologically manipulate people into revealing confidential information or taking actions that compromise security. Burnout, fatigue, misalignment, lack of communication and cognitive overload can impair decision-making and weaken the effect of security measures. Cybersecurity protecting regulations or techniques must balance between providing an efficient and motivating work environment and security protection, ensuring that measures to enhance security do not infringe upon individual working environment in an annoying manner. Finding out how such a balance can be found is an important and interesting challenge for the area of human-computer interaction.

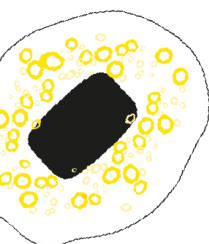
dr. Peter Roelofsma

*Head of Risk Management & Cyber Security group of The Hague University of Applied Sciences
Peter Roelofsma is head of the Risk Management & Cyber Security group of The Hague University of Applied Sciences since 2023, coming from the Safety and Security Science section of Delft University of Technology, where he worked at the Center for Safety in Healthcare. His experience in safety and security involves the domains of SME's, health care, smart cities, military command & control, aeronautical control and risk and management in traffic tunnels. His recent work involves issues regarding: organizational learning, shared mental models, safe and secure by design and the use of AI-coaching and sensors for safety and security. The focus of his research is on the naturalistic decision processes in security operations echelons like operation centers, crises teams, organizations, and governance.*

dr. Jan Treur

*Professor Emeritus, Faculty of Science, Artificial intelligence, Vrije Universiteit Amsterdam
Jan Treur has been a full professor of AI since 1990 and is a well-recognized expert on the area of human-centered AI and multidisciplinary human-like AI-modeling. He has published over 800 well-cited papers about cognitive, affective, and social modeling and AI systems making use of such models. He has also supervised more than 40 Ph.D. students in these areas and from 2016 on written and edited five books on (adaptive) network-oriented AI-modeling and its application in various other disciplines. Current research addresses modeling of higher-order adaptive processes by self-modeling network models with a specific focus on human processes related to cybersecurity and the role of epigenetics in mental disorders.*





Human-Centric Approaches to Solving Societal Problems

dr. Guoray Cai, and prof. Dhananjay Singh

Information Sciences and Technology (IST), The Penn State University, USA

Summary: In this special session, we will look at how artificial intelligence (AI) and human-centered design may work together to address some of society's most serious issues. This panel is intended for professionals, researchers, and practitioners who want to develop AI solutions that are not just technically innovative but also responsive to human needs and societal implications. The session's goal is to educate participants with the information and skills they need to design AI systems that not only push technological frontiers but also bring tangible advantages to persons and communities.

Participants will learn about real-world case studies in which AI has been successfully incorporated to tackle social concerns, and panelists will lead debates about the future of human-centric AI. The focus will be on new trends, technologies, and collaborative activities that can generate inclusive and long-term societal transformation. This session provides an opportunity to engage with thought leaders at the forefront of AI development and help shape a future in which technology serves the greater good.

Dr. Guoray Cai is an Associate Professor of Information Sciences and Technology (IST) at the Penn State University. He directs the Spatial Information and Intelligence Laboratory within the College of Information Sciences and Technology and conducts research in the areas of visual analytics, conversational speech/gesture interfaces, geographical information sciences, and 3D smart sensing. His work on geocollaborative crisis management technologies and online public deliberations are direct response to the challenge of risk society and declining democracy. Dr. Cai received his Ph.D. degree in Information Science from University of Pittsburgh in 1999, a Master of Art degree in geography from West Virginia University in 1993, and M.S. and B.S. degrees in electrical engineering from Tianjin University, China, in 1986 and 1983, respectively. He is a member of ACM, IEEE, and Association of American Geographers (AAG).

Prof. Dhananjay Singh is a Teaching Professor in the College of IST at Penn State University. He previously served as a Professor at Saint Louis University, USA and has over 15 years of experience in both industry and academia in South Korea. Prof. Singh received his B.Tech. in CSE from VBS Purvanchal University, M.Tech. in IT from IIIT Allahabad, India, and Ph.D. in Ubiquitous IT from Dongseo University, South Korea. He directs the ReSENSE Lab, focusing on human-computer interaction, AI, data sciences, and intelligent IoT. He is a Senior Member of IEEE, ACM, and IHCI.

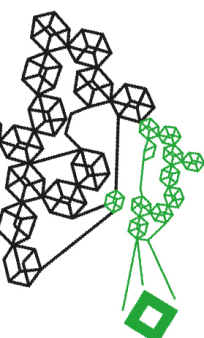
Special Session | Online Only | Exploring Ethical Policies for Integrating Generative AI in Higher Education

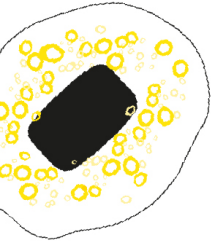
dr. Maria Weber, dr. AnnaMaria Szakonyi, dr. Tatiana Cardona

School of Professional Studies, Saint Louis University, USA

Summary: The session will examine the ethical dilemmas and policy necessities for the responsible integration of AI in academic environments. With the increasing prevalence of AI technologies like automated content generation, virtual tutors, and personalized learning systems in universities, concerns regarding academic integrity, data privacy, algorithmic bias, and equal access emerge. The session seeks to establish a forum for educators, administrators, technologists, and policy-makers to collectively examine optimal techniques for formulating ethical AI legislation. Principal subjects encompass academic integrity in the era of AI, privacy issues, equity in AI-facilitated assessments, and addressing the digital divide. The event will showcase case studies of organizations that have effectively implemented AI policy, providing insights and practical guidance for participants.

The program will include expert speakers, a panel discussion, and an interactive workshop in which participants can design outlines of AI policies for their institutions. At the conclusion of the

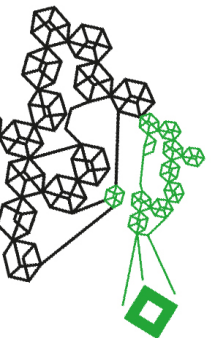




workshop, participants will get an enhanced comprehension of the ethical implications associated with AI and obtain practical frameworks for developing responsible, transparent policies that guarantee ethical and equitable AI utilization in higher education.

Maria Weber, is a distinguished cybersecurity expert with a solid industrial background, holding an M.S. in Applied Analytics from Saint Louis University and a B.S. in Computer Science and Engineering from Universidad Fermin Toro, Venezuela. Maria's career spans expertise in Networking, Wireless, Security, Software-Defined Networking, Applied Analytics, and Automation. She is known for revolutionizing wide area network management through Software-Defined Networking. Maria's research interests encompass Information Systems, Cloud Computing, and Virtualization. Actively involved in professional organizations, she is a member of the ACM's Council on Women in Computing and the IEEE Computer Society Women in Engineering. Her commitment to innovation and inclusivity defines her contributions to the cybersecurity landscape.

Dr. Annamaria Szakonyi is a professor, technology leader & consultant, anti-trafficking researcher, published author and speaker, working at the intersection of technology, policy and society. Her passion is in the application of technology, data and policy to combat human trafficking and the exploitation of women and children. She's received various distinguished awards and scholarships, such as Saint Louis University's inaugural Geospatial Research and Innovation Award for her research using geospatial methods and machine learning to study human trafficking, the Presidential Scholarship of the Republic of Hungary, Erasmus Scholarship from the European Union, and scholarships from the French Republic and the Hungary-Missouri Educational Partnership. She's published multiple peer-reviewed articles and a book chapter with prestigious publishers such as IEEE and Springer related to human trafficking, data science, cybersecurity, online identity theft, and diversity and inclusion in technology. She's an educator and lecturer, technology mentor, and women in tech advocate on a mission to increase the presence of women and underrepresented groups in technology. She has over 15 years' experience in the IT and innovation sector, spanning from Fortune 500 corporations to non-profits and higher education institutions in various technical and leadership positions.

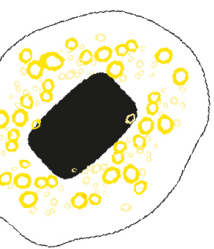


Dr. Tatiana Cardona currently serves as an Assistant Professor at Saint Louis University. With prior roles as an Assistant Teaching Professor at Ball State University and a Visiting Professor at Tech. Institute of Monterrey, she's experienced in instructing undergraduates and graduates in Information Systems, Project Management, and Optimization Models. Her academic journey includes a PhD in Systems Engineering from Missouri University of Science and Technology, complemented by a Master's in Engineering Management and Lean Six Sigma certification.

Special Session | Online | The Role of Blockchain and Data in Addressing Global Challenges

Dr. Graziela Fusaro, and Dr. Madhusudan Singh
Long Island University, USA

Summary: This session, intended for industry experts, researchers, politicians, and practitioners, will examine how decentralized systems and data-driven insights might improve trust, efficiency, and accessibility in many industries. Participants will be exposed to practical examples where Blockchain and Data have been effectively utilized to foster beneficial social transformation, including enhancing supply chain transparency, safeguarding healthcare information, facilitating financial inclusion, and promoting sustainable development objectives. The session will include expert panelists presenting case studies and participating in discussions on emerging trends, policy implications, and collaborative prospects. It will also examine essential inquiries concerning scalability, security, privacy, and governance, emphasizing the possibilities and

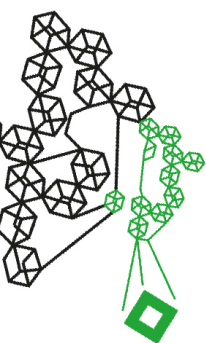


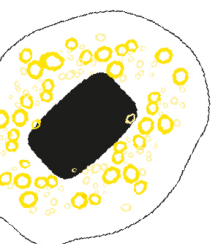
constraints of Blockchain and Data in addressing global challenges.

Dr. Graziela Fusaro has extensive work experience in various leadership roles. From 2022 onwards, they serve as the Dean at Long Island University. Prior to that, they worked as the Founder and Managing Partner at International Consulting Network - ICON since 2015. Graziela also held positions at Adelphi University, where they were the Assistant Provost for Innovation from 2021 to 2022 and the Director of the Innovation Center from 2020 to 2021. Additionally, they served as the Assistant Dean - College of Management at LIU Post from 2015 to 2020. Earlier in their career, Graziela was a Partner at Araujo Fontes from 2005 to 2015.

Graziela Fusaro obtained a Master of Business Administration (MBA) degree in Finance from the University of Illinois at Urbana-Champaign from 1998 to 2000. Currently, they have certifications in Enterprise Design Thinking - Team Essentials for AI, IBM Artificial Intelligence Practitioner - Instructor Certificate, and Enterprise Design Thinking Practitioner, all obtained from IBM.

Dr. Madhusudan Singh is an Associate Professor at Long Island University, Brokland NY, USA. Previsioly he was Assistant Professor at Oregon Institute of Technology (OregonTech), USA. He is IEEE Senior Member and ACM Distinguished Speaker; Dr. Singh has delivered over 30 invited talks and serves as an IEEE Subject Matter Expert. His research spans AI, blockchain, cybersecurity, and quantum computing. He has published over 80 works and is the Series Editor for Blockchain Technologies at Springer Nature.





Invited talks

dr. S. Borsci (Simone)

Associate Professor of Human Factors and Cognitive Ergonomics

Conversational agents for the mimicry of bad human behaviour

Conversational agents are increasingly permeating various aspects of our life, ranging from customer service to personal assistants. These AI-driven entities are designed to facilitate smoother interactions, offering helpful and polite responses. However, programming conversational agents to replicate negative behaviors, such as rudeness, prejudice, or even aggression, can serve specific purposes such as training modules in conflict resolution, psychological studies, and the refinement of AI behavior moderation systems. For instance, these agents can be used in controlled environments to train customer service staff on how to handle difficult interactions, or aid in psychological research by simulating stress-inducing situations. However, this approach carries significant risks. If not properly managed, these AI models could reinforce undesirable behavior or normalize hostility in communications. Thus, the development and deployment of such agents must be handled with caution, ensuring they are used ethically and within contexts that clearly benefit societal or scientific advancements. This talk will present potential usage of such approach for research.

Dr Simone Borsci is Associate Professor of Human Factors and Cognitive Ergonomics at the CODE Section of the Department of Learning, Data Analytics and Technology at the University of Twente. Simone is the research coordinator for the HF-CODE team, the local representative for the Dutch Social Sciences and Humanities Sector Plan Theme Human Factor in New Technology, and Honorary Senior Research Fellow in HF and Medical Device at Imperial College London. Simone specialises in user experience research methods and his interdisciplinary approach bridges the gap between technological development and human-centred design. His research focuses on the intersection of technology, process, service design, user experience and human performance, with the aim of improving the usability and accessibility of (complex) interactive systems. Dr. Borsci is particularly known for his work on standardising UX evaluation methods, contributing significantly to guidelines that help designers and developers create more intuitive and usable products, and for his work on conversational agents.

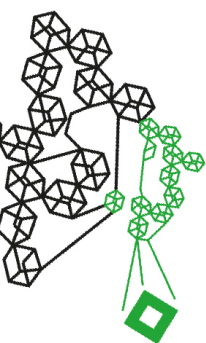
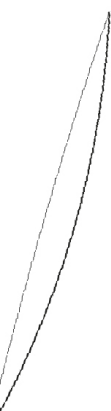
Carolina Herrando

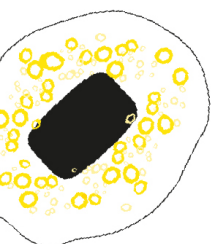
Associate Professor of Marketing, University of Zaragoza

Neuroscience in B2B Marketing: Bridging Emotion, Negotiation, and Strategy.

When customers process information, they also process emotions. Therefore, identifying emotions during information processing is crucial for marketers and businesses to generate an effective customer experience, in both B2C and B2B settings. However, many individual internal neurophysiological processes remain unexplored or difficult to access using traditional marketing methods. Neuroscience allows researchers to study emotions by monitoring neural activity and physiological responses through the various stages of the customer experience. In B2B marketing, neuroscience offers valuable insights into decision-making, price setting, and negotiation processes, among other areas. This talk will present the current state of neuroscience in B2B marketing, along with a fresh methodological perspective on how different communication styles impact negotiation process.

Dr. Carolina Herrando is Associate Professor of Marketing at the University of Zaragoza. Previously she was researcher at the University of Twente. She has been visiting researcher in Hosei University (Japan), in the Marketing Center Münster (Germany), in the BMS LAB (The





Netherlands) and in the Center for Empirical Research of the DHBW (Germany). Her research interests are in the fields of customer experience and artificial intelligence, with particular focus on neuroscience and emotions during the customer journey. Her work has been published in *Journal of Business Research*, *Journal of Retailing and Consumer Services*, *International Journal of Information Management* or *Internet Research*, among other journals.

Krista Hoek

PhD Candidate | Anaesthesiologist | Intensivist Department of Anaesthesiology & Department of Intensive Care Leids Universitair Medisch Centrum

From Theory to Practice: Simulation in Anaesthesiology through Active Learning Experiences

Simulation training has emerged as a cornerstone of medical education in anaesthesiology, providing an immersive and experiential learning environment for learning healthcare professionals. In recent years, virtual reality (VR) has introduced a groundbreaking paradigm to simulation-based training, uncovering many benefits for both educators and learners. By enabling high-fidelity practice in situational awareness, decision-making, and multitiered response systems, VR offers a unique platform for honing clinical skills within a safe yet challenging environment. This article offers an overview of the current landscape of simulation education in medical settings, addressing challenges faced by educators and proposing solutions to enhance the efficacy of simulation-based learning. Additionally, it provides a comparative analysis of traditional manikin-based simulation and VR simulation, highlighting their respective strengths and limitations in medical training.

Krista Hoek earned her medical degree at the Université Sorbonne in Paris, France in 2016. She pursued her medical specialization as an anesthesiologist-intensivist in Leiden, the Netherlands, specializing in education and communication within anesthesiology and intensive care. Hoek's research focuses on the use of Virtual Reality as an educational tool to enhance communication skills. Her main research interests include the learning and implementation of therapeutic communication and team communication in crisis resource management.

Her academic interests are interdisciplinary, and she has presented at various international conferences such as the International Conference on Computer Supported Education, the European Society of Intensive Care Medicine, and the International Conference on Communication in Healthcare, among others. Additionally, she has been involved in various projects funded at both the national and regional levels.

In 2021, she received a grant from Tech for Future (TFF) to collaborate with Saxion University on the development of a VR training platform for anaesthesiologist-intensivists. Furthermore, she is a member of Euro XR, the European Network for Virtual Reality, Augmented Reality, and Mixed Reality, and serves on the Scientific Committee.

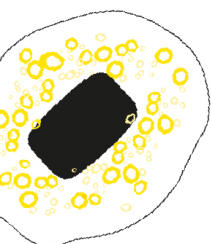
Prof. dr. ir. Wolter Pieters

Professor of Work, Organisations and Digital Technology Work and Organisational Psychology - Behavioural Science Institute Faculty of Social Sciences - Interdisciplinary Research Hub on Digitalization and Society (iHub), Radboud University

Responsible digitalization or the digitalization of responsibility? Work, technology and responsibility practices

Around new technologies with large potential impact, such as artificial intelligence, there is often a call for responsible innovation. This requires early involvement of stakeholders to identify relevant values, in order to make sure that those values can be taken into account in the design. However, it is not always clear to what extent such adaptations in the design are meaningful in the practices surrounding the use of the new technology in work environments.





For example, if artificial intelligence is made explainable to improve transparency, why and how would users want to make use of such a feature? Social sciences can play a key role in addressing the practical aspects of responsible digitalization, which is why “the human factor in new technologies” is one of the interdisciplinary themes in the Dutch investment in social sciences via the so-called “sector plans”. In this talk, I will outline how social sciences can provide an essential contribution to responsible digitalization through studying “responsibility practices”, including for example seeking, receiving and challenging advice, searching for information, or communicating decisions, and the impact of technological developments on those practices. In particular, I will look at the challenges of studying those practices in situations where interaction with digital technologies goes beyond 1-on-1 situations, as in human-AI teams.

Wolter Pieters is professor of Work, Organizations and Digital Technology at the faculty of Social Sciences at Radboud University. Previously he was associate professor of Cyber Risk at Delft University of Technology, faculty of Technology, Policy and Management. He has an interdisciplinary background in computer science and philosophy of technology, and published widely on cyber risk management, information ethics, and human factors in cybersecurity. In recent years he has specialized in practices around digitalization, with a focus on responsible behaviour, including safety, (cyber)security and privacy in work environments as well as responsible use of artificial intelligence. At Radboud University, he is the contact person between the faculty and the university-wide iHub initiative on digitalization and society. On a national level, he is coordinator of the theme "The human factor in new technologies" in the sector plans of the social sciences.

prof.dr. J.E.W.C. van Gemert - Pijnen PhD (Lisette)

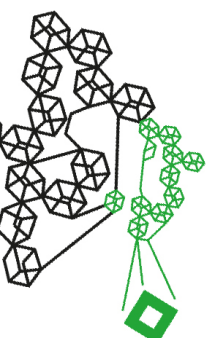
Full Professor Persuasive Health Technology

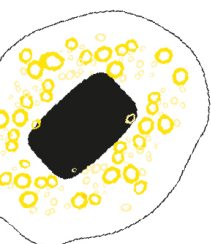
KEEP IT WORK

Keep IT work! Remember Covid and digitalisation, privacy by design was the driving force to develop contact tracing apps. Overruling Human centred design and holistic development of eHealth technologies.

In this presentation I will focus on case studies about data driven eHealth technologies that struggle in finding a balance between privacy by design and human centred design, this in the context of how we can enhance multi-site and cross nations data sharing. Keep IT work, referring to holistic development and privacy enhancing technologies to achieve personalized HealthCare. The case studies are Telemonitoring of heart failure, Hybrid care in mental care and Decision Support systems for ICU. The studies were conducted in the Netherlands, in order from Dutch Secretary of Health and Sports. This to understand the barriers and facilitators for Keep IT work and to accelerate digitalisation In healthcare. The balance between privacy by design and Human centred design is of utmost precarious in the context of data sharing across institutes and nations, to enable personalization of treatments in healthcare (Fit between people, tech, context and data). Current Privacy Enhancing Techniques can be applied (like multiparty computation and synthetic data) to keep IT work, overcoming the limitations in data sharing and finding a balance between privacy by design and holistic, user centred design. My presentation will be based on the aforementioned 4 cases and recent work for World Economic Forum and Frontiers about Global Scale Data sharing.

Lisette van Gemert-Pijnen is professor persuasive health technology, University of Twente, Netherlands. My research & tuition focusses on persuasive designs to increase trust, engagement and adherence to technologies, and to develop methods for implementation in practice. I founded and I coordinate the first Center for eHealth Research and Disease Management (www.ehealthresearchcenter.nl). I am involved in a university wide strategic





research Programma to accelerate the uptake and implementation of health technologies. <https://www.utwente.nl/en/techmed/research/research-programmes/sht/>

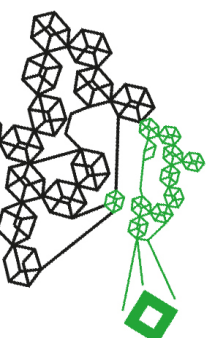
Dr. Manon Tolhuizen

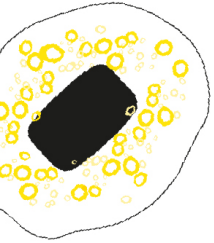
AI scientist at Thales Netherlands

REAL-TIME MENTAL WORKLOAD CLASSIFICATION FOR FUTURE COCKPIT PILOTS AIDING IN OPERATIONAL EFFICIENCY

Fighter pilots have to deal with environments with increasing complexity. Consequently, their mental demand increases because more information needs to be processed during time-critical situations. An imbalance in increasing task demands and limited available cognitive resources can lead to a drop in the pilot's performance and raise the risk of human error. The Enhanced Pilot Interfaces & Interactions for fighter Cockpit (EPIIC) project funded by the European Defense Fund (EDF) aims to design the next-generation fighter cockpit, focussing on speeding up the pilot's Observe, Orient, Decide and Act (OODA) loop. Part of this fighter cockpit design is the integration of a real-time mental workload monitoring system, aiding in pilots' operational efficiency. As a contribution to the EPIIC project, Thales NL will develop a machine learning model for mental workload classification. The model will be integrated within Thales' HumAn peRformance MonitOring and eNhancement sYstem (HARMONY). During our invited talk, we will elaborate on our data acquisition protocol, the challenges in the development of a mental workload machine learning model, and our motivation for using the HARMONY system.

Manon Tolhuizen is an AI scientist working at Thales Netherlands. She has been part of the human behaviour analytics (HBA) lab since 2021. The HBA-lab is focused on the development of human machine teaming applications in Command and Control settings. Manon works on the development of machine learning models for real-time human state classification and the design and execution of several empirical studies for data collection. Her main interest is understanding the human brain and human cognition. Her background is in Technical Medicine and she received her doctorate from the University of Amsterdam in 2021. During her PhD she used AI for image segmentation and image biomarker assessment to predict the treatment effect and clinical outcome of patients with acute ischemic stroke.

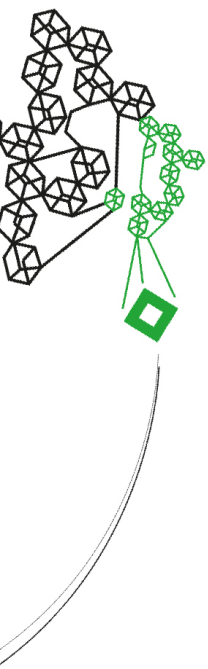
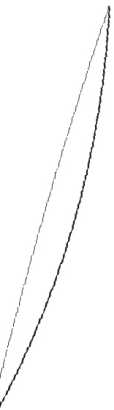




Proceedings

Revised short and full paper publications presented at the conference will be published by Springer Lecture Notes in Computer Science (LNCS) after the conference. The Conference Organisation and Springer guidelines and technical instructions must have been fulfilled in order to publish.

LNCS series are published at <https://www.springer.com/gp/computer-science/lncs>.

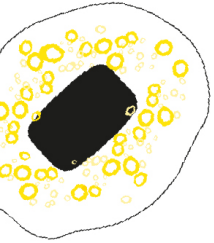


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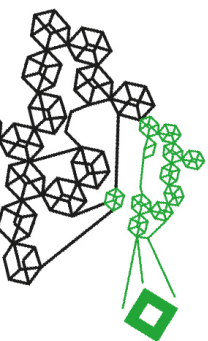
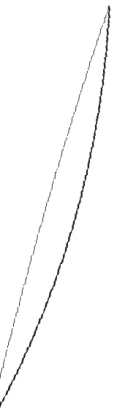




Schedule



<https://www.utwente.nl/en/bms/ihci2024/programme/>



IHCI 2024

MEANINGFUL HUMAN COMPUTER INTERACTION

- 08:45-09:30 | Lounge | Walk in & Registration
- 09:30 – 10:00 | Learn-X | Opening ceremony
- 10:00-10:45 | Learn-X | Keynote by Prof. Dr. Anna-Marie Brower
Are you attending? - Monitoring attentional engagement through synchrony in physiological signals
- 10:45-11:15 | Lounge | Break
- 11:15-12:00 | Learn-X | Keynote by Prof. Dr. Bernard Veldkamp
About the reliability and validity of using AI to analyze intensive longitudinal data
- 12:00-13:00 | Lounge | Lunch break



Full program

<https://www.utwente.nl/en/bms/ihci2024/programme/>

13:00-14:30 | Learn-X | Learning in healthcare and wellbeing

Krista Hoek: From Theory to Practice: Simulation in Anaesthesiology through Active Learning Experiences

Claudio Pighini: LifeCharger Syncare Mobile App: a preliminary usability study

Elise Sarton: A VR experience exposing the hidden curriculum of the operating room: a case study

Ágnes Karolina Bakk: An Exploration of Phantom Touch as a Design Aspect to Enhance Wellbeing and Safety in Social VR

13:00-14:30 | Inspire | Robots & conversation agents (1)

Simone Borsci: Conversational agents for the mimicry of bad human behaviour

Natalia Amat-Lefort; Christiaan van Driel: More Human, Less Bot: How Anthropomorphism Impacts UX in Customer Support Chatbots

Snehal Walunj: Context-aware Robotic Assistance for Workers using Intention Recognition and Semantic Digital Twin

13:00-14:30 | Connect | Physical world & Posters

Islambek Saymanov: Online Monitoring System of Groundwater in the Aral Region Based on the Internet of Things

Jorge Herrera: Application of Machine Learning Techniques for Leak Detection in a Horizontal Pipeline Transporting a Water-Glycerol Mixture

Muhammad Farooq Siddique: Pipeline leak detection: Leveraging Acoustic Emission Signal Processing and Machine Learning

Anees Muhammad Hassan: Connected lives: Revolutionising health and social interaction with wearable technology in India

Anshul Verma: Addressing Graphviz File Generation Issue in CPN Tools: A Java-based Solution

13:00-14:30 | LA2518 | Special Session: Human Factors in Cyber Security by Lector Peter Roelofsma & Jan Treur

Lisa van der Does and Jan Treur et al.: Analysing the Rise of Biohacking in a Tech-Driven City: Assessing Risks through Adaptive Network Modeling

Tanner Blomquist and Samuel Šebok et al.: Organizational Response to APT Attacks: Computational Analysis by Behavioral Network Modelling

Ioana Ivan et al.: Understanding Insider Threats Behaviour: An Adaptive Network Model for the Evolution of an Insider Threat

Wissal Mestour et al.: An Adaptive Network Model to Analyse Cybersecurity: Understanding Cyber Threats in Financial Institutions

Niek Jan van den Hout et al.: Computational Analysis of Human Factors in Spear-Phishing Attacks: An Adaptive Network Model

Peter Roelofsma et al.: Computational Analysis of User Experience of Password-Based Authentication Systems

Full program

<https://www.utwente.nl/en/bms/ihci2024/programme/>

14:30–15:00 | Lounge | Break

15:00–16:30 | Learn-X | Human factors

Manon Tolhuisen: Real-time mental workload classification for future cockpits aiding in operational efficiency
Laurie A Marsman: Transforming ATC with CODA: Adaptive Automation and HMI Approach
Ysanne Yeo: What Does “Remote Driving” Mean for People: A Futurespective Design Approach
Subi Hahn: Reimagining the Utility of Dash Cam Data in Autonomous Travel Contexts: A Service Design Proposal

15:00–16:30 | Inspire | Robots & conversation agents (2)

Kim Jong-Hoon, Nafiul Alam: Robot-to-Robot Collaborative Knowledge Sharing with Human Operators under Constraint Resources through Connotative 2.5D Mapping
Nese Baz Aktas: Conversational Agent Design: A Comprehensive Analysis of Research from Leading Conferences
Saifuddin Mahmud: Enhancing Firefighting Robot's Capability: A Comprehensive Implementation for Enhancing Firefighting Robot's Operations
Kim Jong-Hoon, Saifuddin Mahmud: A Novel Framework for Collaborative Knowledge Sharing and Learning for Disaster Response Robots
Paulina Zguda: I prefer robot cats!' Reflections on robot animal-like morphology from an in-the-wild Child-Robot Interaction workshop

15:00–16:30 | Connect | Algorithms and computer vision

Pritish Varadwaj: Transfer Learning to Identify Multilingual Machine Generated Text
Hannah Cho, Jong Hoon Kim, Naiful Alam: A Novel Preprocessing Method for Transforming Federal Sentencing Data to Ensure Unbiased AI Adjudication Research Using Large Language Models
Sarvar Makhmudjanov, Dhananjay Singh: Methods of optimization of diagnostic data for patients on a given condition
Phan Duy Duy Hung, Huynh Anh Khoa: Keyframe Extraction based on Large Vision Transformer Model and kNN-DBSCAN Clustering
Phan Duy Duy Hung, Huynh Anh Khoa: Improving Polyps Segmentation in Colonoscopy Images using Modified UNet3+ Network
Phan Duy Duy Hung, Vu Thanh Lam: Scheduling for Lecturers using Genetic Algorithm with Fuzzy Constraints
Phan Duy Duy Hung, Phan Nguyen Duc Hieu: No Code Computer Vision

16:30–18:00 | BMS Lab | Welcome reception



Full program

<https://www.utwente.nl/en/bms/ihci2024/programme/>

IHCI 2024

MEANINGFUL HUMAN COMPUTER INTERACTION

- 08:45-09:15 | Lounge | Walk in
- 09:15 – 10:15 | Learn-X | Keynote by Prof. Dr. Encrico Caiani
Digital health and biomedical engineering innovation
- 10:15-10:45 | Learn-X | Panel discussion: Prof. Dr. Lisette van Gemert-Pijnen, Prof. Dr. Sandra Fischer, Prof. Dr. Enrico Caiani, Prof. Dr. Dhananjay Singh & Dr. Ir. Jan-Willem van't Klooster
Meaningful Human Computer Interaction
- 10:45-11:15 | Lounge | Break
- 11:15-12:15 | Learn-X | Keynote by Prof. Dr. Sandra Fischer
Motivated trust in AI: Looking at technology from different perspectives
- 12:15-13:30 | Lounge | Lunch break
- 12:15-13:30 | Learn-X | Infosession on working and studying at UT by Jaap Stout



Full program

<https://www.utwente.nl/en/bms/ihci2024/programme/>

13:30-15:00 | Learn-X | IHCI across domains

Wolter Pieters: Responsible digitalization or the digitalization of responsibility? Work, technology; and responsibility practices
Varsha Singh: Synergizing Visualization Techniques and Machine Learning for Enhanced Diabetes Prediction and Management Using Tableau
Wladislaw Kostak: Assessing the Impact of Web Accessibility on User Satisfaction
Tom Gross: TeamMeetingArranger: A Less Disruptive Way of “Do you have a minute?”

13:30-15:00 | Inspire | Augmented & virtual reality

Enrico Caiani: A Survey-based Evaluation of Interactive Virtual Reality Scenarios to Assess Emotions
Paolo Boffi: Physics Playground: Insights from a Qualitative-Quantitative Study about VR-Based Learning
David Flaig: Implementing a VR-Enabled Bicycle Simulator: Integrating Physical Sensor and Actuator Data for a Realistic Simulation Experience

13:30-15:00 | Connect | Usability & UX

Elena Polleri: Mobiquity: a personalized accessibility proposal for an inclusive mobility application
Piero Maggi: Discrimination by experience: Survey users with disability about their attitudes, usage, and satisfaction of Italian digital services
Shridhar S. Mehendale; Ankit Walishetti : DexAssist: A Voice-Enabled Dual-LLM Framework for Accessible Web Navigation
Lipsa Routray: Assessing the Usability of Electric Car Interfaces: A Focus group study

13:30-15:00 | LA2518 | Special Session: Human-Centric Approaches to Solving Societal Problems by dr. Guoray Cai, and prof. Dhananjay Singh

15:00–15:30 | Lounge | Break



Full program

<https://www.utwente.nl/en/bms/ihci2024/programme/>

15:30-17:00 | Learn-X | Healthcare & clinical

Lisette van Gemert-Pijnen: Keep it work

Anita Vrins: NeuroWizard: Investigating the Effect of Gamification on BCI Performance among Adult Users with ADHD

Manoj Kumar Singh: Detection of Symptoms of Mental Disorders using Hindi Corpora

Abhishek DR. Shrivastava: Design and Development of a Human-Centered AI-based Speech Therapy Tool for children with Speech Sound Disorder

15:30-17:00 | Inspire | IHCI in society

Carolina Herrando: Neuroscience in B2B Marketing: Bridging Emotion, Negotiation, and Strategy

Hongxin Xu: A Framework for Digital Technology to Foster Intergenerational Bonds at Home

Ankit Kumar Singh: RAMM: A Residual Attention Multimodal Model for Humor Detection

Antonio G C Gonzalez: GSIP: a new system for prosody selection for gibberish speech

15:30-17:00 | Online | Special Session: Exploring Ethical Policies for Integrating Generative AI in Higher Education by
dr. Maria Weber, dr. AnnaMaria Szakonyi, dr. Tatiana Cardona

15:30-17:00 | Online | Special Session: The Role of Blockchain and Data in Addressing Global Challenges by dr. Graziela Fusaro, and dr. Madhusudan Singh

17:00–18:00 | Learn-X | PhD & young researcher forum

17:00–18:00 | Lounge | Break

17:00–18:00 | De Broeierd | Conference dinner



Full program

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