

Colloquium HCI

CS & BME

It is a pleasure to invite you to the colloquium for our Professorship in Human Computer Interaction at Graz University of Technology. The public part will be a short educational presentation at Bachelor's level 2nd year in Computer Science on topic Building User Interfaces, a scientific talk (titles below), and a discussion with the audience.

Colloquium Human Computer Interaction – 5th to 9th February 24

Data House – Showroom (DHEG136E) – Sandgasse 36 EG

Strohmeier Paul: " Shaping Experience and Expression by Designing Sensorimotor Contingencies "

5th February 2024 | 09:00 h

Abstract:

"Our experience of the world is mediated by a continuous feedback loop between motor activity and sensory stimuli. Manipulating these sensorimotor loops offers a powerful means to influence user experience. Such loops, updating in milliseconds, demand devices with higher temporal resolution than those typically used in conventional human-computer interaction (HCI). In this talk, I will show how tapping into sensorimotor loops with tactile feedback allows us to alter our experience of the physical world and our own bodily sensations. Additionally, I will discuss how we can go beyond simply augmenting experience to enhancing human expression through sensorimotor augmentation."

Lex Alexander: " Human Factors in Data Visualization "

5th February 2024 | 14:00 h

Abstract:

In this talk, I will look at human factors of visualization design through different lenses. First, I will review the role of human knowledge in data analysis and how visualizations and user interfaces can help to leverage and preserve it. Second, I will discuss approaches to make complex visualizations accessible to low-vision and blind users. Next, I will introduce methods to seamlessly transition between interactive and computational data analysis approaches, allowing analysts to consistently use the best tool for their data analysis job. And finally, I will highlight how we can evaluate whether specific interactive visualizations approaches work at scale. Throughout the talk, I will emphasize how human factors influence the methods and designs.

Echtler Florian: "Decentralized Ubiquitous Interaction “

5th February 2024 | 16:30 h

Abstract

In this talk, I will present my research which centers around the intersection of ubiquitous computing, peer-to-peer networking, and security/privacy. Our current mobile and cloud ecosystem is heavily dependent on a few large corporations, thereby limiting our digital self-determination. I am looking for new ways to enable seamless mobile interaction with people and services without being dependent on any central infrastructure.

Veas Eduardo: "Designing Tomorrow: Navigating the Interface of Human and AI Interaction “

6th February 2024 | 09:00 h

Abstract

My research focuses on advancing human-centered computing methods to amplify, augment and empower human capabilities. In the first part of my talk, I will introduce early works demonstrating the design of information presentation techniques that align with human perceptual abilities.

As complexity of information grows, analytics increasingly shifts towards machine learnt models. These models need regular updates to remain relevant and the strategies thereto are not straightforward. Conversely, when learning or imitating complex human tasks, our modelling approach calls for a closer observation of human performance. The second part of my talk will illustrate these points, showcasing examples of human-centered computing in action. Finally, we engage in a vision, where AI serves as a supportive and empowering partner, enhancing human capabilities, fostering collaboration, and ensuring a positive impact on society. We focus on three fundamental elements. i) Developing human-centered systems that perceive and interpret the world environment, human emotions, cognitive and health status. ii) Promoting AI systems that are not only powerful but also transparent and interpretable and iii) Offering interfaces that enable interaction with AI in context. Throughout the presentation, I will highlight our contributions to the Human-Centered Computing Lab and our educational concept for the next generation of HCC researchers.

Kosch Thomas: "Physiological and Behavioral User Interaction “

6th February 2024 | 14:00 h

Abstract

In today's world, interactive technologies are a regular part of our daily lives. For example, extended reality and artificial intelligence have played a significant role in moving interfaces closer to the user while making them more personalized, resulting in user interfaces that adapt toward users. However, despite these advancements, current interfaces need to assess user perception and expectations, leading to mismatches between users and technologies in the long term. This presentation explores ways to measure user understanding and intention, assisting with computer interfaces when needed.

1. The presentation showcases how interfaces can leverage physiological and behavioral data to assess user perception using artificial intelligence, enabling computer systems to gain insights into user perception.
2. The implementation and integration of these approaches into users' daily lives are presented to illustrate the practicality of predictive sensing-based user interfaces.
3. Finally, the presentation concludes by highlighting the seamless integration of these concepts into our daily interaction paradigms. This integration fosters a symbiotic relationship between humans and machines, combining the computational efficiency of computers with human flexibility to facilitate efficient interaction.

Meschtscherjakov Alexander: "HCI on the Move: Interaction While from Running to Driving“

6th February 2024 | 17:00 h

Faller Lisa-Marie: "User-adapted Medical Assistive Devices Through Individualized Fabrication "
7th February 2024 | 09:00 h

Abstract:

FUNCTIONAL ASPECTS: Currently available medical assistive devices (prostheses, orthoses, splints, rehabilitation equipment, etc.) are neither produced using individualized designs nor individually functionalized. This causes major issues as soon as a desired functionality cannot be properly realized or user comfort is significantly negatively affected. Issues could be: infections and pain due to deficient fit of prosthesis, injury due to insufficient adaptation and wrong actuator placement in rehabilitation devices, as well as wrong and harmful training due to the lack of monitoring. For prosthesis and splints which have to be worn permanently, high weight, lack of thermal management as well as an insufficiently designed human-device-interface are major inhibitors of user well-being. Here, the wrong choice of materials which are in contact with human skin can additionally lead to allergies and skin irritations.

SOCIAL AND INDIVIDUAL ASPECTS: Due to often high costs, in general, such medical aids are not available or equally accessible for people at all levels of income. Costs is also the reason why the production of rehabilitation devices for home usage is not yet well established and available devices exhibit comparably high complexity in usage, application, adjustment and configuration. Another consequence is a low grade of individualization which is further also a social issue with respect to the resulting optically unappealing design possibly leading to social exclusion. In this respect, user-specific design enabled by 3D-printing can help 30 Mio. people around the world.

Wintersberger Philipp: " Escaping the Trap of Distraction: AI-Supported Multitasking in Human-Computer Interaction "

7th February 2024 | 16:30 h

Abstract

In the future, humans will cooperate with a wide range of AI-based systems in both working (i.e., decision and recommender systems, language models, or industry robots) and private (i.e., fully- or semi-automated vehicles, smart home applications, or ubiquitous computing systems) environments. Cooperation with these systems involves shared (i.e., concurrent multitasking) and traded (i.e., task switching) interaction. As it is known that frequently changing attention can yield decreased performance as well as higher error rates and stress, future systems must consider human attention as a limited resource to be perceived as valuable and trustworthy. This talk addresses the emerging problems that occur when users frequently switch their attention between multiple systems or activities and proposes to develop a new class of AI-based interactive systems that integrally manage user attention. Therefore, we designed a software architecture that utilizes reinforcement learning and principles of computational rationality to optimize task switching. While computational rationality allows the system to simulate and adapt to different types of users, reinforcement learning does not require labeled training data so that the concept can be applied to a wide range of tasks. The architecture has demonstrated its potential in laboratory studies and is currently extended to support various multitasking situations. The talk concludes with a critical assessment of the underlying concepts while providing a research agenda to improve cooperation with computer systems.

Kriglstein Simone: " The Different Faces of Player Interaction "

08th February 2024 | 09:00 h

Abstract

The history of human-computer interaction (HCI) shows that there has always been a close connection with game development. Player interaction can be seen as a special form of HCI. A creative and playful approach can offer new ways, approaches, and interaction possibilities which, in turn, can serve other applications such as training solutions in medicine or education. As such, HCI-related games research focused strongly on understanding player behavior, factors that influence player experience, and novel interaction techniques that enable new game experiences. In this talk, I will demonstrate the importance of visualizations to analyze and understand player behavior. Furthermore, I will present examples to showcase how playful interactions can give rise to new experiences and how a playful approach can be applied in other domains.

Pohl Henning : "Using Mixed Reality to Enhance Everyday Activities "

8th February 2024 | 14:00 h

Abstract

Mixed reality has the potential to make good on the promises of mobile interaction: to integrate interaction into our lives and offer support while out and about, engaging in our everyday tasks. Instead of stopping and looking at screens, this kind of interaction would weave into our existing tasks and activities and improve them in subtle or more overt ways. I will present examples from previous work on occluded interaction and spatialized memory, as well as current work on augmentation of calculation, everyday activities, and interpersonal interaction.

Mayer Sven: "The Next Generation of Computing Systems: Artificial Intelligence meets Humans "

9th February 2024 | 09:00 h

Abstract

Traditionally, humans used machines to support them while staying in full control. However, today, intelligent systems support us in the digital and physical world without the user needing to initiate the support, allowing humans to be better. For instance, smartphone text entry uses prediction algorithms to improve human typing performance. Here, the human-in-the-loop approach guarantees that the final result aligns with the human expectation. Yet, with more intelligent systems entering our daily lives, such as self-driving cars, the question becomes how and to what extent users can stay in control. However, direct interface manipulation is most likely too time-consuming with the growing number of systems. Thus, the next generation of computing systems must provide explicit and implicit methods allowing the user to control AI-powered systems. In this talk, I will highlight how my research sits at the intersection between Human-Computer Interaction and Artificial Intelligence, allowing humans and machines to learn and accomplish tasks better together.

Frauenberger Christopher

9th February 2024 | 14:00 h

Computer Science & Biomedical Engineering