

Vorträge im Rahmen des Besetzungsverfahrens der Tenure-Track-Stelle für Informatik mit Schwerpunkt Human-Computer-Interaction

Montag 09. Mai 2022, 09:00 Uhr
Raum 3W03, Institut für Informatik, ICT Gebäude

Philipp Wintersberger (TU Wien)

Attentive User Interfaces for Continuous Interaction with Digital Technology

Abstract:

The number of touchpoints between humans and technology is permanently increasing. More and more digital services are present in our workplaces, and we also expose ourselves to a great variety of media content. We frequently multitask and alternate between messengers, email, social media, and other apps. Often, these services interrupt us during our daily activities. However, the adverse effects of multitasking are increasingly damaging. It is well documented that interruptions can reduce performance and error rates while increasing stress. In workplaces, this can strongly reduce productivity. In safety-critical settings such as driving, it can lead to property damage and even death. Still, cooperating with machines or algorithms while being engaged in other tasks will become standard in many domains such as mobility, manufacturing, and health. Consequently, there is a need to better deal with the limited resource of human attention. Attentive User Interfaces are human-machine interfaces that manage user attention and adapt appropriately, for example, by precise timing of interruptions and information delivery. In this talk, I will present results from user studies in automated driving, where we could demonstrate that Attentive User Interface principles can significantly affect traffic safety and driver stress. We will bridge the gap from this specific use case to the general challenge of developing domain- and task-independent attentive user interfaces and discuss our ongoing work toward reaching this goal. Systems managing user attention need to be developed urgently, and they may have enormous potential for supporting humans who are continuously confronted with technology.

Montag 09. Mai 2022, 13:00 Uhr
Raum 3W03, Institut für Informatik, ICT Gebäude

Miroslav Bachinski (Universität Bayreuth)

Improving User Experience of Post-Desktop User Interfaces with Biomechanical Models

Abstract:

Post-desktop user interfaces give users more freedom to broaden interaction space and use their whole body besides their hands and fingers for computer input. At the same time, these interfaces pose significant challenges to interface designers due to the large non-uniform design space of possible movements, difficulties in assessing physical ergonomics, and the lack of relationship between the objective ergonomics characteristics of an interface and the subjective user experience. This presentation introduces movement dynamics models, musculoskeletal models and inverse biomechanical simulations as universal methods applicable to research and design tasks within the field of Human-Computer Interaction. The practical value of these data-driven methods is demonstrated in the tasks of evaluation, modelling and optimisation of post-desktop user interfaces. Further, generative biomechanical modelling and simulation are proposed as future research directions to improve our understanding of human high- and low-level motor control and decision making besides biomechanics in interactive tasks.

Montag 09. Mai 2022, 16:00 Uhr

online unter: <https://webconference.uibk.ac.at/b/bor-zhe-j0c-cns>

Andrii Matviienko (TU Darmstadt)

Intelligent Assistance Systems in Urban Environments

Abstract:

Urban drift is unavoidable, and by 2050 two-thirds of the world's population will be living in cities. This will pose a need to create a safe and user-friendly interaction in urban environments. In particular, vulnerable road users, who are less protected than car drivers, would require systems and interaction concepts to facilitate safe and effortless mobility. In this talk, I will present research about the design and construction of technical prototypes, methodology, and self-driving micro-mobility in the context of HCI:

1. I will talk about the assistance presentation via multimodal and mixed reality interfaces and recognition of their physiological state.
2. Afterward, I will present the gradual shift towards real-world conditions by adding mixed reality interfaces.
3. Finally, I will outline the possibilities to facilitate interaction between users and self-driving micro-mobility.

Donnerstag 12. Mai 2022, 13:00 Uhr
online unter: <https://webconference.uibk.ac.at/b/bor-zhe-j0c-cns>

Anil Batmaz (Kadir Has University Istanbul)

Towards Better VR/AR Training Applications for m-health

Abstract:

Virtual Reality (VR) and Augmented Reality (AR) Head-mounted displays (HMDs) are quickly becoming more affordable and accessible for mobile health (m-health) applications. Based on this trend, software developers, engineers, and practitioners from various fields are increasingly using HMDs in m-health VR/AR applications, with target areas including training and continuing professional development for health care workers, telemedicine and remote patient monitoring. However, the current technology and methods used in VR/AR systems still restrict user performance and user experience, making the resulting applications potentially unattractive to patients, trainees, or medical professionals. In this talk, I introduce my research that aims to widen the application of VR and AR technologies in m-health training systems. I first present how the user's experience during mid-air interaction in VR/AR head-mounted displays can be improved through Human-Computer Interaction methods and then how insights from cognitive science can provide better feedback to users. Finally, I discuss how machine learning and AI can be integrated into m-health VR\AR training systems.

Freitag 13. Mai 2022, 13:00 Uhr
Raum 3W04, Institut für Informatik, ICT Gebäude

Pascal Knierim (Universität der Bundeswehr München)

Designing Ubiquitous Mixed Reality

Abstract:

With the newest technological advances, we are now able to experience sophisticated mixed reality (MR) experiences. The transition towards MR as the next immersive platform is an apparent advancement following the ever-lasting evolution of media. Wearable MR technology, however, has not yet replaced our smartphones, nor has MR become a ubiquitous companion in our daily lives.

In this talk, I present how MR experiences can help us during knowledge work, education, and even enhance our perception of reality, eventually becoming an integral part of our daily interactions with digital information. First, I will showcase the great potential and challenges of MR systems in creating future working environments. In particular, how might text input be achieved in MR? Next, I will explain how we can facilitate the unique features of MR technology, namely combining virtual information with the real tangible word, to build innovative and engaging learning environments. Finally, I envision how MR can enhance our perception of reality and outline future research objectives to advance humans' ability to interact seamlessly inside MR environments.

Freitag 13. Mai 2022, 16:00 Uhr
Raum 3W04, Institut für Informatik, ICT Gebäude

Ceenu George (Universität Augsburg)

Seamless Interaction between Virtual and Physical Reality

Abstract:

Virtual reality with head mounted displays disconnects the user from the physical reality. Thus, while their body is in the physical reality, their senses - most prominently their visual sense - is immersed in the virtual reality. I will discuss the various challenges that this unfolds and I will introduce interfaces and concepts from my research that aim to reduce this disconnect.

Montag 16. Mai 2022, 09:00 Uhr
Raum 3W04, Institut für Informatik, ICT Gebäude

Thomas Kosch (TU Darmstadt)

Interfaces Augmenting the Human Mind

Abstract:

Technologies provide physical and cognitive augmentations in our daily life. However, most interfaces cannot sense user states and require manual user interventions for human augmentation, creating a mismatch between user expectations and usability. Moreover, after 40 years of research in human-computer interaction, computer devices still lack awareness about user states that imply cognitive and physical competencies. Subsequently, (a) devices require direct instructions for augmentation that (b) lack in-situ assistance, implying the (c) absence of intelligent interventions. In this talk, I will present research to implicitly sense user states and present intervention strategies that provide cognitive augmentation:

1. I will show how interfaces implement cognitive assessments to make them aware of the user's mental states during interaction.
2. Then, I will discuss the implementation and integration of the presented approaches into the user's daily life, demonstrating the feasibility of ubiquitous user state measures and their impact on the interaction experience.
3. Finally, I envision how the presented research will form a close man-machine symbiosis regarding future research and its ethical implications.

Montag 16. Mai 2022, 13:00 Uhr
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Yomna Abdelrahman (Universität der Bundeswehr München)

Novel Domestic Sensing Technology

Abstract:

Thermal cameras have recently drawn the attention of HCI researchers as a new sensory system enabling novel interactive systems. They are robust to illumination changes and make it easy to separate objects from the scene background. Far-infrared radiation, however, has another characteristic that distinguishes thermal cameras from their RGB or depth counterparts as it operates in the non-visual spectrum. On the other hand, the visual spectrum, i.e., human visual perception, is limited to only 1 percent of the electromagnetic spectrum. Research has shown that extending visual perception can be beneficial, but it is unclear whether this is useful for a broader range of applications in daily setups by novice users. To investigate the potential of domestication and adoption of thermal imaging, we are conducting a set of explorative studies in different forms including user/lab studies, interviews, proof-of-concept prototype technology, and cultural probe. Throughout the conducted research, we collected various thermal data in different formats such as videos, photos, and raw temperature representation. Our findings reflected the potential of thermal imaging domestication and the adoption of such technology by novice users. Additionally, we found that the users were excited about using thermal cameras in their everyday lives and found many practical uses for them. Our studies provide insights into how novice users wish to use thermal imaging technology to augment their vision in daily setups as well as identify and classify common thermal imaging use cases. Our work contributes implications for designing thermal imaging devices targeted towards novice users. Our results are beneficial not only to thermal imaging devices, but rather non-traditional sensing technologies.