



## **JOURNAL ON MULTIMODAL USER INTERFACES**

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## **CALL FOR PAPERS**

**Special issue on “multimodal interfaces and communication cues for remote collaboration”**

### **Guest editors:**

Prof Mark Billingham, University of Auckland, New Zealand

Dr. Kangsoo Kim, University of Central Florida, USA

Dr. Seungwon Kim, University of South Australia, Australia.

In many real-world scenarios, people need help from a remote expert to operate. For example, when a broken machine needs to be fixed by an expert who is not present on location, when a doctor needs to conduct an operation on a patient with the essential help of a distant surgeon, or when a crime scene investigator needs help from a forensics expert. To support these scenarios, researchers and professionals have researched on this topic for past two decades. A variety of technologies where multimodal communication cues (verbal and visual cues) can be shared between a local worker and a remote expert helper have also been proposed and developed to meet the demand of technologies to support remote collaboration. Despite the effort and progress, it is only recently when the technical breakthrough has been made due to rapid development and enhancement of Augmented Reality (AR) and mobile/wearable technologies. Typically these technologies add AR visual communication cues, such as pointing, sketching, or hand gestures, on top of a video conferencing system where audio communication was available, in order to improve the collaboration experience and task performance.

This special issue targets on novel design principles, technical advancements and evaluation methodologies that are to address issues surrounding multimodal communication cues, interaction and interfaces for remote collaboration. The primary objective is to compile a collection of high quality contributions from researchers to reflect the latest state of the art of research in this space. It will foster a focused attention in this new development of the field and to serve as forum for researchers all over the world to exchange and discuss the latest advances.

Papers to be submitted to this special issue must focus on multimodal communication cues and multimodal interfaces (e.g. combination of several input and/or output modalities such as gesture, speech, vision, graphics, gaze, haptics, touch, etc.). All submitted papers will be peer-reviewed and papers will be selected based on their quality and relevance to the theme of this special issue. Topics considered for this special issue include, but are not limited to, the following:

- Effects of different combination of multimodal communication cues on collaboration
- Effects of multimodal communication cues on trust, presence, and coordination
- Tools for building augmented reality systems to support remote collaboration
- Effect of social, cultural, language and emotion cues on collaboration
- Interaction models for collaboration in augmented reality
- Case studies, user studies, and application systems of multimodal user interfaces and multimodal gesturing/interaction
- AR based human-machine interfaces, frameworks, reference models, architectures, tools and systems

#### **Schedule:**

Submission due: 1 September 2019

Review due: 1 November 2019,

Final version due: 1 January 2020

Publication: February 2020

#### **Instructions for authors:**

Submissions should be around 8-12 pages and must not have been previously published, with the exception that substantial extensions of conference and workshop papers (at least 30% new content) can be considered.

Authors are requested to follow instructions for manuscript submission to the Journal of Multimodal User Interfaces (<http://www.springer.com/computer/hci/journal/12193>), to submit manuscripts at the following link (<http://www.editorialmanager.com/jmui/>) and to select the article type : SI-REMOTE-COLL

#### **Bio of the guest editors**

Prof Mark Billinghurst

(<http://empathiccomputing.org/team/mark-billinghurst/>)

Prof. Mark Billinghurst has a wealth of knowledge and expertise in human-computer interface technology, particularly in the area of Augmented Reality (the overlay of three-dimensional images on the real world). In 2002, the former HIT Lab US Research Associate completed his

PhD in Electrical Engineering, at the University of Washington, under the supervision of Professor Thomas Furness III and Professor Linda Shapiro. As part of the research for his thesis titled Shared Space: Exploration in Collaborative Augmented Reality, Dr Billinghamurst invented the Magic Book – an animated children’s book that comes to life when viewed through the lightweight head-mounted display (HMD).

Not surprisingly, Dr Billinghamurst has achieved several accolades in recent years for his contribution to Human Interface Technology research. He was awarded a Discover Magazine Award in 2001, for Entertainment for creating the Magic Book technology. He was selected as one of eight leading New Zealand innovators and entrepreneurs to be showcased at the Carter Holt Harvey New Zealand Innovation Pavilion at the America’s Cup Village from November 2002 until March 2003. In 2004 he was nominated for a prestigious World Technology Network (WTN) World Technology Award in the education category and in 2005 he was appointed to the New Zealand Government’s Growth and Innovation Advisory Board.

Research interests: Dr. Billinghamurst’s research focuses primarily on advanced 3D user interfaces such as: Wearable Computing – Spatial and collaborative interfaces for small wearable computers. These interfaces address the idea of what is possible when you merge ubiquitous computing and communications on the body. Shared Space – An interface that demonstrates how augmented reality, the overlaying of virtual objects on the real world, can radically enhance face-face and remote collaboration. Multimodal Input – Combining natural language and artificial intelligence techniques to allow Human-Computer Interaction with an intuitive mix of voice, gesture, speech, gaze and body motion.

Dr. Kangsoo Kim

(<https://sreal.ucf.edu/people/kangsoo-kim/>)

Dr. Kangsoo Kim is a Postdoctoral Scholar at the Synthetic Reality Lab (SREAL) in the Institute for Simulation and Training (IST) with an appointment in the College of Nursing, University of Central Florida (UCF). He is currently leading multiple Mixed Reality (MR) projects related to perceptual and behavioral influence in real–virtual human interactions, and enhanced human perception in MR.

His research interests broadly cover pervasive context-aware MR systems to improve user experience and perception in MR, while emphasizing social interactions with or through virtual entities. He completed his PhD in Computer Science at UCF, under the supervision of Professor Gregory F. Welch in 2018. His PhD dissertation investigated human perception of virtual humans in real–virtual human interactions, and revealed that coherent and plausible virtual human behavior interacting with the surrounding physical environment can improve the sense of social presence (being together) with, and the trustworthiness of, the virtual human. To achieve such plausible interactions, he introduced various multimodal interfaces for virtual humans to communicate with users.

In line with his research interests in MR and User Experience (UX), he has extended his knowledge through multiple research internships, including as a technical intern at Universal Creative, a UX research intern at Facebook, and a research intern at Army Research

Laboratory-West. He has published papers in major journals and conferences, including IEEE TVCG, Frontiers, CAVW, IEEE ISMAR, IEEE VR, and ACM IVA, achieving a Best Student Paper Award at ACM VRST 2017 and an Honorable Mention Award at ICAT-EGVE 2018. He has been a reviewer or a program committee for a number of academic associations, such as IEEE TVCG, MDPI MTI, PLOS ONE, ACM VRST, IEEE ISMAR, IEEE 3DUI, and ACM IVA.

Dr. Seungwon Kim

(<http://empathiccomputing.org/team/seungwon-kim/>)

Dr. Seungwon Kim is a Postdoctoral Research Fellow investigating the remote collaboration system. With Augmented Reality technology, he adds visual communication cues (such as pointer, sketch, and virtual hands) in the shared live video of a video conferencing system and studies the effect of them for better remote collaboration. He has presented papers at major A/A\* international conferences such as CHI (will present) and ISMAR, and journals such as JVCI, TIIIS, CSCW. He also has reviewed dozens of papers at CHI, ISMAR, VR, ICAT, TVCG, BIT, and IMWUT.

Dr. Seungwon Kim developed one of the early remote collaboration interfaces that anchors virtual sketches in real world without a marker and previous tracking data, and introduced the auto freeze function for a drawing annotation interface.

In 2013, he was selected through the Microsoft Worldwide Internship program by Nexus group at Microsoft Research (MSR) in Redmond. At MSR, he developed interfaces for Skype that includes three additional views (a high quality image view, a map view, and a scene view) together with a live video stream.