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Experimental Evaluation of User Interfaces for Visual Indoor Navigation

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Mobile location recognition by capturing images of the environment (visual localization) is a promising technique for indoor navigation in arbitrary surroundings. However, it has barely been investigated so far how the user interface (UI) can cope with the challenges of the vision-based localization technique, such as varying quality of the query images. We implemented a novel UI for visual localization, consisting of Virtual Reality (VR) and Augmented Reality (AR) views that actively communicate and ensure localization accuracy. If necessary, the system encourages the user to point the smartphone at distinctive regions to improve localization quality. We evaluated the UI in an experimental navigation task with a prototype, informed by initial evaluation results using design mockups. We found that VR can contribute to efficient and effective indoor navigation even at unreliable location and orientation accuracy. In this talk I will talk about identified challenges and share lessons learned as recommendations for future work.

Matthias Kranz
Professor Matthias Kranz is a full chaired professor and heads the "Lehrstuhl für Informatik mit Schwerpunkt Eingebettete Systeme" (Institute for Embedded Systems") at Universität Passau, Germany. He studied computer science at Technische Universität München and completed his Ph.D. research at Ludwig-Maximilians-Universität, München. After some years in industry at German Aerospace Center, he returned to academia. After several prior appointments, he accepted the position in Passau in March 2013. He researches at the intersection of Embedded Systems and Human-Computer Interaction. The main goal of embedded interaction is to look at new opportunities that arise from embedded systems for interactive systems and the immediate value users gain. He researches on methods, tools and applications of networked embedded systems and novel forms of human-computer interaction with these systems. Application areas of his research are user interfaces in general, novel forms of human-computer interaction, mobile and embedded systems, automotive user interfaces, and applications for the Internet of Things.