

**Title**

Enabling the Computer for the 21<sup>st</sup> Century to Cope with Real-World Conditions: Towards Fault-Tolerant Ubiquitous Computing

**Abstract**

Ubiquitous computing research is driven by the vision of invisible computing woven into every day life. The digital world is embedded into the physical world – and vice versa – by means of sensor and actuator technology, everywhere, facilitating connectivity even when being on the move. In order to support continuous user interaction with a potentially large number of computers nearby, human computer interaction patterns are about to evolve into implicit and indirect interaction patterns that require minimal user attention. Successful laboratory prototypes have already demonstrated the feasibility of various smart applications and frameworks, but one important question remains: will these complex ubiquitous computing systems operate dependably, invisibly, calmly, and ongoing under real-world conditions that are faulty by nature?

In this talk, an overview of recent ubiquitous computing approaches for fault modeling, error detection, and fault tolerance is presented. Additionally, potential concepts from the related domains distributed and mobile computing, embedded real-time systems, and human computer interaction will be discussed in terms of applicability to ubiquitous computing environments. Examples will be used to illustrate the concepts, for example, for sensor networks and smart home environments. The talk will conclude with a description of our own proactive movement-aware approach and a presentation of recent projects and initiatives.

**Biography**

Karin A. Hummel is a research and faculty member at the Department of Distributed and Multimedia Systems, Faculty of Computer Science, University of Vienna. Before joining the University of Vienna, she was working with Siemens Austria AG on distributed computing, system software, and the Intelligent Network. Dr. Hummel received her diploma degree in Computer Science in 1996 and her PhD in 2005 from the Vienna University of Technology. Currently, she is participating in international and national projects, like the EuroNGI project and the Austrian Grid project. Her research interests and publications include topics like mobility modeling, mobile distributed and ubiquitous computing, context-aware computing, mobility-aware computing, fault-tolerant systems, and mobile learning.