
Smart Environments and Universal Access

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Abstract

Future smart-environment scenarios predict a fundamental change in human-computer interaction. The development of new classes of interaction techniques is not limited to business applications but rather affects all areas of our lives (e.g., at home, in the car, etc.). My main interest is to enable just about any user to interact with smart environments, i.e., without regard to his or her age, skills, or experience (thus, "universal access"). This especially includes the consideration of so-called fringe groups which are often neglected.

Keywords

Living and interacting in a smart, augmented environment; HCI; ubiquitous computing

Research Interests

I am interested in how human beings might live in future smart environments and how they can benefit from it.

This is not necessarily limited to already well researched scenarios in the fields of business (applications) but rather concentrates on areas of everyday living. Another important aspect is the

inclusion of often neglected fringe groups such as children, the elderly and challenged people.

A main objective is to develop and evaluate interfaces for HCI in smart and augmented environments for all possible target groups ("universal access").

In this context, I intend to cover the following (admittedly large) research areas with focus on specific topics to be determined yet: learning, living, and playing in Ubicomp environments. Learning and playing are already covered by the terms "pervasive learning" and "pervasive games", respectively. 'Living', however, covers several topics, for example "ubiquitous health" or "augmented living rooms".

Besides a technological perspective, I also plan to take social issues into account.

Approach and Methodology

Above all, my approach is rather broad than deep, looking at issues from several angles and point of interests. The goal is to look at possible short- and medium-term future scenarios.

I see two different approaches to this end: the development of new scenarios and, thus, new interactions techniques on the one hand; and, on the other hand, the improvement of already existing ideas and solutions in order to better support a wider variety of users. Both approaches require me to get an overview of existing approaches and technologies and to further identify and find current problems and weak solutions.

Conclusions and Future Steps

My first step is to accumulate information about current ideas, approaches and technologies that have a direct impact on human beings. This especially includes HCI ("how do we interact with a smart environment based on ubiquitous computing?").

Second, I would like to select several topics for a closer examination. Currently, I intend to further research on ubiquitous learning, pervasive games, u-health, RFID end-user applications, smart environments / ambient intelligence, internet of beings. Potential technologies are RFID/NFC, UWB, orientation systems, and others.

Third, I plan to develop some prototypes and applications in selected areas. Consequently, I would like evaluate and assess these solutions in terms of acceptance and usability (mainly based on user studies).