UNIVERSITY OF AMSTERDAM

Minimal Mobile Human Computer Interaction

A. El Ali

The constant change of the physical and social context in a user's situation made possible by the portability of mobile devices means that the user's attention becomes limited. This can negatively impact the user experience. To deal with this problem, this thesis draws from two developments in Human Computer Interaction (HCI), context-awareness and 3D gestural input. From these developments, we introduce the concept of minimal mobile HCI, a subset of eyes-free mobile interaction that allows minimal combination of the visual modality with other sensory modalities to improve the user experience of interacting with smartphones.

In the first part, we look closely at the design and evaluation of location-aware multimedia messaging systems, and how they can lead to playfulness in a minimal interaction setting. We then look at the design and evaluation of an exploration-based route planner that makes use of large amounts of geotagged data. In the second part, we look closely at the usability and user experience issues associated with 3D mobile gestural interaction when recognition errors occur. We then look at how 3D gestural interaction can be used for gesture-based music composition and gaming, and lastly how to support mobile user authentication using 3D gestural input.

Our user studies show that interaction designers need not abandon screen-based interaction, nor stop designing for users' visual modality, only complementing it with context-awareness or 3D gestural input solutions. This can expand the design space for designing and developing mobile systems/applications that keep user interaction costs at a minimum.