

Ambient and mobile systems: new challenges for interactive systems analysis*

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Abstract

Ambient and mobile systems bring potential for innovation to the way that information and services are offered to the users of physical environments such as leisure complexes, hospitals, airports and museums. Such systems are always on in the background, and can be used to deploy information to the user according to their context and location. Whether they are successful or not depends on how users experience the space in which they are situated as well as the more usual considerations of device and display usability and accessibility. What experiencing a system in a particular way might mean is difficult to express and implement in a system. For example, in an airport, creators of the environment might intend the ambient and mobile system to create for travellers an experience of place as opposed to a forbidding sterile space, or intend the system to allay the anxiety of travelling in an unfamiliar world. This talk is concerned with how to reason about whether systems will satisfy experience requirements and how this framework for reasoning might be integrated with more traditional analyses of interaction with the devices and displays involved. In particular it is concerned with whether existing techniques for analysing distributed systems might be applicable to these imprecise concepts that are so difficult to articulate. The talk is speculative about the set of tools and techniques required to achieve experience centred design. It explores a combination of formal techniques and prototyping to assess these further qualities of experience in the design of an interactive system. A focus on experience in ambient and mobile systems provides an opportunity for a fresh look at evaluation in interactive systems. Traditional notions of usability need reconsideration. Apart from the importance of experience to users, ambient and mobile systems have other distinctive characteristics that lead to a requirement for special treatment:

- *the impact of the environment as the major contributor in understanding how the system should work - its texture and complexity*
- *the use of location and other features in a software model of context to infer implicit or incidental user action - how natural and transparent this inference is.*

Methods for eliciting experience requirements are first discussed, exploring the limitations of scenarios and personae. Then the ingredients and requirements for a tool for combining the analysis of usability requirements with experience requirements are developed. Two examples are discussed. The first focuses on usability requirements for a mobile device to support process control and the second focuses on experience requirements by considering how information flows within an airport system. Finally a future agenda for completing a toolset to support the objectives is proposed.

Biography

Professor Michael Harrison is the Director of the Informatics Research Institute at the University of Newcastle-upon-Tyne, UK. He has worked both in universities (lectureship at Exeter and lectureship, senior lectureship and chair at York) and industry (software designer with CAP and project manager at Inmos). His research has reflected this combination of backgrounds, being concerned with the application of formal methods to the problem of user interface design. He has recently moved substantially away from the use of formal notations to formal methods that can integrate with industrially relevant processes and approaches. His research is now focussed on ambient mobile intelligence, extending analysis techniques to systems that will dominate our future. In this regard he works within an interdisciplinary framework.

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