

Recent research in mobile computing: A review and taxonomy of HCI issues

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Abstract

This paper presents an overview of Human Computer Interaction issues in mobile systems based on publications from the past five years (1998-2002). The research is summarized in two taxonomies, one by research topic and one by design lifecycle stage. These taxonomies highlight those areas where most research has been focussed and those areas currently lacking research

1 Introduction

The past five years has seen strong growth in mobile computing devices and applications, through the availability of faster, smaller and more energy efficient central processing units (CPUs), better screen technologies, alternative input devices and micro sized storage formats. The Human Computer Interaction (HCI) issues associated with such devices and applications demonstrate that beyond the functionality and usability issues that play important roles in desktop systems, mobile systems have added HCI issues such as constraints in usable miniaturisation and ubiquity.

2 Methods

A survey was conducted of the most widely investigated research areas dealing with HCI issues in mobile systems undertaken in the past five years (1998-2002) by reviewing the Mobile HCI proceedings (ACM Mobile HCI 1998-2002). A total of 107 papers were analysed and grouped into two taxonomies, one by research topic and the other by systems design life cycle stage (Fig 1,2).

3 Discussion & Conclusions

Novel interfaces and information visualisation were popular research directions in the field, whereas sociological effects and home control systems were the least popular. Systems that exploit location and contextual awareness are becoming prominent areas for mobile user services development. This in turn is facilitating strong development of mobile requirements gathering ideas and new scenario models of computer usage. Expert evaluations and mathematical modelling were not popular areas of research in terms of lifecycle development whereas designing systems were very popular. Empirical user based studies and ethnographical analysis in user needs requirements were strongly promoted research areas in the mobile HCI community. We believe that this research aids in highlighting the developing maturity of the field and those topics within the development of mobile systems that need further work from HCI researchers.

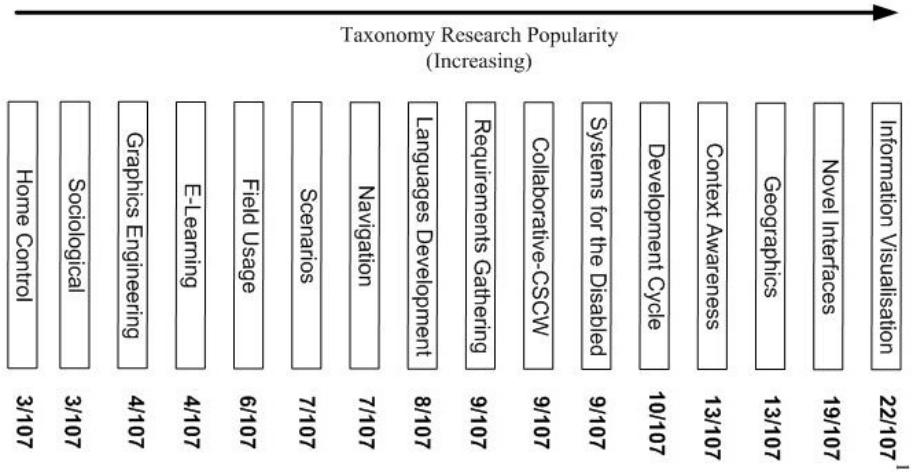


Figure 1: Taxonomies by type

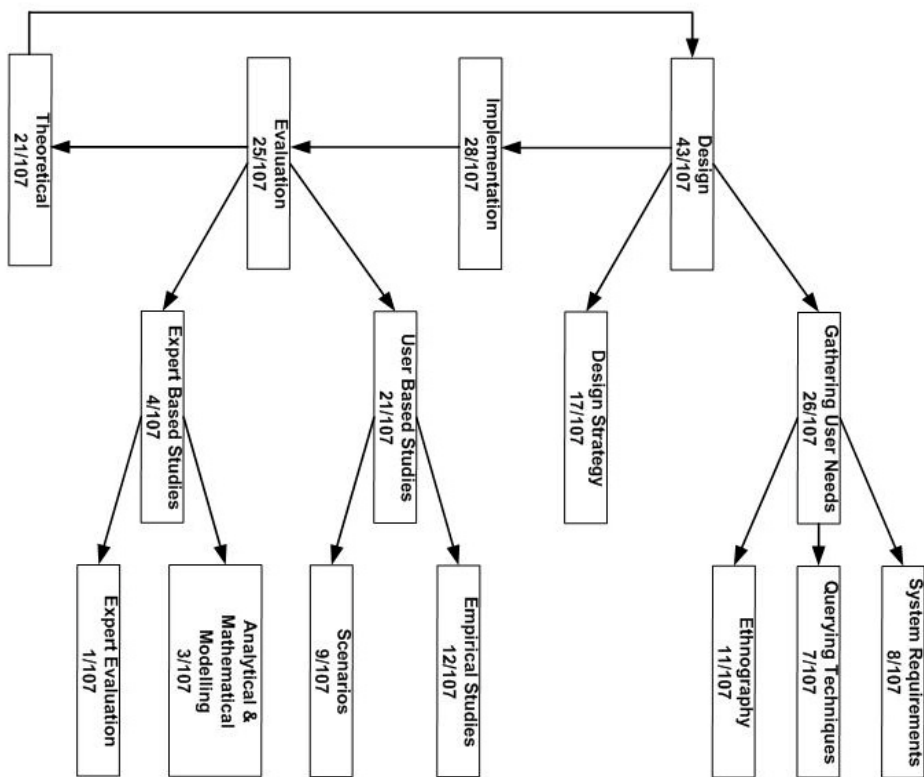


Figure 2: Life Cycle Research Popularity

¹ Number of papers matching this group of 107 papers reviewed in total

References

- ACM Mobile HCI Conferences (1998-2002), Proceedings of the ACM Mobile HCI, ACM Press.
- ACM Interactions (2000 & 2001), ACM Press.