At the Quality and Usability Lab of Deutsche Telekom Laboratories, which is part of the Technische Universität Berlin, there is an opening for a

Master’s Thesis / Diploma Thesis

on the following topic:

A Surface-Augmented Paper-Prototyping System for Mobile Applications

Introduction
Paper prototyping [1] is used by interface designers for rapid evaluation of interface designs in very early stages of interface development. This usually consists of drawing user interface (UI) screens on pieces of paper or post-it notes and simulating the interface with test users by exchanging the paper sketches according to behavior specified in the design.

The Task
Using an unobtrusive interactive surface [2], consisting of a combination of cameras, a projector and IR finger tracking, you will design a novel paper prototyping environment leveraging the advantages provided by tabletop computing such as a large display space and collaborative interaction. With pre-defined UI elements tagged with visual markers and also real-time scanning of written input, it should be possible to create a system in which basic UI designs can be laid out on a tabletop and where simple application behavior can be defined, i.e. reacting to a button press and switching between application screens. Ultimately, this system will generate skeleton code for read mobile applications.

We chose to target mobile applications because they are usually small in scope, which allows paper prototypes to cover a large area of the application’s final functionality in very early stages of development. Furthermore, a current trend in mobile applications shows the increasing popularity of web-based applications. Web applications are easy to implement in the context of HTML and JavaScript files, and do not need to be compiled. We believe that the generation of skeleton code for mobile web applications can be easily implemented using the prototyping system to be developed in this thesis.

Research Questions
Your research will involve comparing the novel paper prototype system with existing approaches. To evaluate its effectiveness, you will invite a group of expert users to design a simple application with classical prototyping methods and with the surface-augmented system. You will gather qualitative and quantitative data during your user study.
Task Breakdown

- Literature review of current paper-prototyping practices and previous paper-prototyping support systems and also current standards in the design of mobile UI interface widgets. (1/2 month)
- Identify generic behavior (ideally in the form design patterns) of mobile user interfaces and identify a set of standard UI widgets to implement in the paper-prototyping system. A starting point for this could be to look at the UI standards of the Apple iPhone [3], Google Android or Nokia Series 60. (1/2 month)
- Implementation of the paper-prototyping system. (2-3 months)
- Development and planning of a user study. (1/2 month)
- Evaluation of study results. (1/2 month)
- Time permitting: implementation of automatic code generation for mobile web applications. (1 month)

Requirements

- Good programming skills in an object-oriented programming language, Java preferred.
- Prior knowledge in Human Factors or HCI is desirable.

Literature Cited


[3] *iPhone Human Interface Guidelines*,

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