Answering why and why not questions in ubiquitous computing

Jo Vermeulen, Geert Vanderhulst, Kris Luyten and Karin Coninx
Hasselt University – tUL – IBBT, Expertise Centre for Digital Media, Diepenbeek, Belgium

The Problem
Users often find it hard to understand and control the behavior of a ubiquitous computing environment [1].

Preliminary User Study

• 5 voluntary participants from our lab
• 3 tasks in which behavior occurred that users had to understand and control using our prototype

Method

 all subjects were able to use the why questions to find the cause of events in each of the three tasks.
 in a post-test semi-structured interview, participants generally indicated that they found our technique useful and easy to use.
 the why menu sometimes became cluttered
 it was not always easy to predict the outcome of invoking the control mechanisms (e.g. undo)

Results

Future Work

• improving our prototype based on feedback from the informal user study
• formal evaluation
• investigating the required developer effort to make ReWiRe applications “why-question”-ready

References


Further Information

Please contact jo.vermeulen@uhasselt.be for more details.

More information on this and related projects can be found at:
http://research.edm.uhasselt.be/~jvermeulen/ubicomp09/

Our Solution

1. Allows users to ask two types of questions:
   - why? → arising from unexpected events that occurred
   - why not? → arising from expected events that did not occur

2. Provides basic control mechanisms (undo, redo) and specific control UI’s (e.g. to play media)

How?
We rely on the existing Ubicomp framework ReWiRe [5], which allows us to trace events across distributed components.

To support why questions, ReWiRe’s rule-based behavior model was annotated.

Motivation

• existing studies have demonstrated the potential of why questions in debugging [2], user interfaces [3] and context-aware systems [4].
• to date, there has been no practical reusable implementation of why questions for ubiquitous computing environments.