Poster paper

Beyond the listbox: the use of very rapid physical prototyping in software engineering

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This paper describes the use of very rapid physical prototyping in teaching software engineering.

Within the software engineering course we introduce concepts of logical design and human computer interaction. What the students expect is for us to tell them guidelines for the look of software – minimum font size etc. Over the last few years we have not taken this approach but tried to get the students to think at a higher level - what the software is doing for the user, what else are they doing at the same time and so on. Following the user focus ideals of Nielsen (1993) a goal of "help but get out of the way" is presented before coming back down through the abstraction levels of task analysis, sequence diagrams and so on to return, unfortunately, to looking for rules for minimum font size etc and to the standard (and extremely limited) toolkit of buttons, listboxes and combo-boxes. The students see the time spent at the abstract levels as a waste of time.

This year we are introducing the use of very rapid physical prototyping using Phidgets (Greenberg and Fitchett 2001). Phidgets are described as physical widgets, are building blocks that help a developer easily construct physical user interfaces: "Graphical widgets are interface components.buttons, listboxes, etc.that are 'glued' together to make complex graphical interface. Similarly, physical widgets.sensors, motors, RFID readers are combined to make complex physical interfaces". Phidgets are simple to program, they are controlled through a simple API, or by dropping a graphical counterpart of the device onto a standard interface builder such as Visual Basic

Such very rapid physical prototyping makes it possible to work 'outside the box'. This means we can come back down from the abstract levels of logical design to an area that is both novel and exciting.

Students and graduates from Otago Polytechnic's BIT have an advantage in their ability to develop computer systems on both a standard computer and microprocessors. With increasing importance of 'ubiquitous computing', this ability will become more significant. A difficulty of working in this area, however, is a long development time, even to proof of concept prototypes which usually requires considerable coding at a low level. By taking a very rapid physical prototyping approach, we hope to further enhance our ability to deliver innovative and exciting projects.

Greenberg, S., and Fitchett, C. (2001) Phidgets: Easy Development of Physical Interfaces through Physical Widgets, Proceedings of the ACM UIST 2001 Symposium on User Interface Software and Technology, November 11-14, Orlando, Florida. ACM Press. www.cpsc.ucalgary.ca/grouplab/papers/

Nielsen, J. (1993). "Noncommand user interfaces." Communications of the ACM **36**(4): 83-99.