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# Update

### *The Research Office Newsletter*
*Featuring OSU research and scholarship in all disciplines, and the services of the Research Office*

# De-bugging for Computer Users

Margaret Burnett of the School of Electrical Engineering and Computer Science, with a six-campus team of computer scientists, is getting national attention for research that will help the common computer user.

Even if you don't think of yourself as a technically-able person, much less a programmer, you are actually "building software" when you interact with a junk-mail filter or a web-authoring program, create a spreadsheet on Excel or a presentation on Power Point. And you probably make some mistakes that result in "bugs" that will plague your project.

That's where EUSES (End Users Shaping Effective Software) can help. The researchers, directed by Burnett and with OSU as the lead institution, includes Martin Erwig and Curtis Cook of computer science and Ellen Ford, Nancy Wortmann, and Maggie Niess of Math and Science Education. Their work is resulting in effective ways software can assist, motivate, and teach people to painlessly recognize, find, and "exterminate" their own computer bugs.

## Funding, Media Attention, and Patenting

The research, funded by a $2.65 million grant from the National Science Foundation, has been covered in this article on CNN http://www.cnn.com/2004/TECH/ptech/07/27/debugging.ap/index.html, by National Science Foundation, and in PC magazine, among other publications. (See media list at eecs.oregonstate.edu/EUSES/#inTheNews ).

The results are not only being heralded, but will also be available. Laurel Halfpap, Assistant Director of OSU's Office of Technology Transfer, says that one patent so far has been issued by the U.S. Patent and Trademark Office, and another has been applied for and should be issued soon. "The media attention shows there's a great commercial promise for this technology," she says.

## Education

Burnett is excited about all of the branches and applications of the research. One of the unique tracks is the "educational piece" being pursued in partnership with OSU colleagues Niess, Ford and Wortmann. Burnett says, "The education team, led by Maggie [Niess], promotes the idea that when technology is taught to lay people, the curriculum must include teaching that users have a responsibility for quality control. We ran a pilot program for teachers to address this new approach."

## Effective Alerts

Burnett is perhaps not a stereotypical 'computer-type.' She says, "Some technical people think 'If we build it, they will come.' We're thinking instead of the end user. We realize that their time is costly, and they don't necessarily want to study and understand the software. In fact, our findings show that it is not very helpful for software to interrupt their concentration in its attempts to help them solve a problem.

"So one thing we have researched is how best to attract their curiosity but not demand their attention, to alert them to a problem. It turns out that people are more likely to pay attention, and also to understand how to solve a problem, with a subtle approach. The successful intervention is similar to wiggly underlining to indicate a spelling error. The aggressive 'Mr. Clippy' type of interruption can interfere with a person's problem-solving strategies, and further does not help as much with a person's understanding."
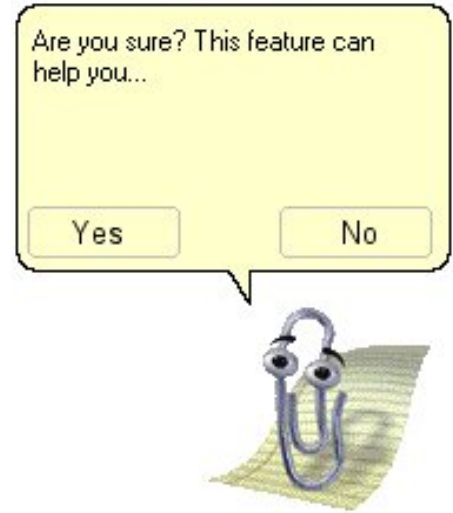
She adds, "We've also had encouraging results with, borrowing from the field of psychology, giving what we call 'emotional rewards' - simple ways to show the user how well they're progressing in their de-bugging." A paper on that part of the work will be presented at the Institute of Electronic and Electrical Engineers symposium on Visual Languages in Rome this September.

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