Designing optimal menus with no effort

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Researchers at the Max Planck Institute for Informatics and Saarland University have constructed a menu optimizer for a GUI builder. Based on a model of user performance, MenuOptimizer evaluates the efficiency of the current menu and suggests improvements, hence enabling the design of better menu systems with significantly less effort.

The last time you searched for a menu entry in your word processor, you probably thought "Why is this not there, where I expect it to be?" And then you mused, "Why did the designers not put a bit more emphasis into the logic structure." But given that a mere 6 menu entries can offer more than 479,000,000 different menu systems, you might want to reconsider that complexity. A hierarchy with only 50 commands, less than most word processors, creates a large search space of $100! ? 10^{158}$ possible menu systems – which is beyond any manageable limit.

Designing user interfaces is a complex, expensive, and time-consuming process. To support the software developers, computer scientists from Saarbrücken, Germany, have built an integrated interactive optimization tool. The proof-of-concept has been integrated in Qt Designer, a widely used design tool, to design complex menu systems. For designers, the system aims at accelerating the design process and facilitates decision-making in the team. For users, the system aims at producing more efficient graphical user interfaces. The designer can edit the menu normally while the optimization method explores a large number of designs in the background in order to find ones superior to those used now.

The lead researcher, Gilles Bailly, states: "The challenge was to combine the designers' abilities to design interfaces with the power of the computer to explore large search space to guide the design process."

This novel approach can radically change how designers work. First, the system will inform the designer about the impact of their choices on performance. Designers can thus decide to revisit the current design. Second, the system will provide suggestions of menu design in order to accelerate the design process. To let designers interact with the optimizer, researchers have integrated a large number of interactions to define the optimization problem, the objectives, and the constraints. The result is that designers, even novice designers, can design good menus with 38% less effort.

The work is being presented at the UIST 2013 conference in St Andrew on October 10. UIST is the premier forum on User Interface Software and Technology. MenuOptimizer will be made available on the project page: www.gillesbailly.fr/menuoptimizer/

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