



Automatic icons organize files

By Kimberly Patch, Technology Research News

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Everyone knows it is more difficult to memorize a set of facts or words than a set of pictures. Everyone also knows it is way too easy to misplace files on a computer.

Researchers from the University of Southern California, the Massachusetts Institute of Technology, and ESC Entertainment are aiming to improve the lost-in-cyberspace problem with a tool designed to tap people's facility with pictures.

The system, dubbed VisualID, automatically generates detailed icons for specific files. It assigns similar icons to related files by mutating the original icon in a series. The degree of mutation depends on the degree of similarity of the file names, which gives the user an approximate visual sense of saliency, according to J.P. Lewis, a researcher at the University of Southern California.

A sticker-dispensing version of the system allows icons to be put on real-world objects as well.

The idea is to allow people to use the visual sense to identify files and objects in order to improve computer navigation and real-world organization, said Lewis. The icons are not meant to replace textual information like file and objects names, but augment them, he said.

The software version of the system could eventually be used as a view-by-appearance mode in a file browser similar to the view-by-icon and view-by-date modes that exist now, said Lewis.

Beyond file management, the icons system could be used for systems like air-traffic control, said Lewis. "Where a person has to repeatedly scan the same data and make quick decisions, adding a VisualID to the other textual information might reduce fatigue and increase reliability," he said.

The sticker versions of the icons could be applied to real-world objects like nearly identical tools on a submarine or the space shuttle, said Lewis. "In doing an emergency repair someone might need to repeatedly switch between several wrench sizes," he said. "Putting VisualIDs on every wrench should allow this to be done more quickly."

In a practical system, a VisualID would be created automatically whenever a new file is created, said Lewis. If a person is working on a quarterly report, for instance, the folder containing the project would have several document files, some spreadsheets, some figures, and some notes. And as a person is working she would need to locate and open various files.

When the person looks for a particular file he will notice almost unconsciously its VisualID, or appearance, and after opening a file a couple of times he will likely find himself looking first for the VisualID, and then confirming that it is the correct name, said Lewis.

The system "exploits the fact that appearance is efficiently learned, searched and remembered, probably more so than file names," said Lewis. "Psychological research has shown that searching for a picture among other pictures is faster than searching for a word among other words."

The bottom line is that interfaces need scenery, said Lewis. This is readily apparent. "When we look for a book on the bookshelf, we look for it by appearance first, rather than scanning every title one-by-one," he said. "As... memory fades, the appearance of a book often stays with us longer than the exact title; people frequently say things like 'that red calculus book'."

Research on enhancing navigation and spatial data display shows that

they require distinctive appearance, or scenery, in order to be effective, said Lewis. The appearance of individual files in current graphical user interfaces is akin to a parking lot or garage where everything looks the same, causing people to get lost easily, he said.

The researchers experiments show that given detailed icons, people will identify a file visually first. "One surprising thing was how easily people learn these abstract icons, and how long they remember them," said Lewis "I surprised some people who took one of the studies and gave them an unexpected recognition quiz six weeks later." People still recognized the VisualIDs he said.

The biggest technical challenge the researchers had was to make the icons as distinguishable as possible, said Lewis. There's not a lot of research that shows what is visually distinctive and there's no theory of how to algorithmically explore the full space of distinctive patterns, he said. Because of the lack of precedent, the researchers' designs "involved just following my instinct of what was distinguishable," Lewis said.

The researchers' next step is to figure out a way impart in a visual ID both a file type and a distinct identity for a given file, said Lewis. "One wants to be able to see at the same time that a file is a Word .doc file and see distinctive appearance."

The researchers are also exploring the usefulness of the system for people with certain cognitive impairments, said Lewis.

It would take three to five years to develop the system fully, said Lewis.

Lewis's research colleagues were Ruth Rosenholtz from the Massachusetts Institute of Technology, Nickson Fong from ESC Entertainment, and Ulrich Neumann from the University of Southern California. The researchers presented the work at Association of Computing Machinery (ACM) Siggraph 2004 conference in Los Angeles, August 8 to 12.

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