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A LOOK INTO THE MAINTENANCE OF WINDOWS: EXPERT SYSTEM HONED FOR HISTORIC PRESERVATION MAY MEET NATIONAL NEED

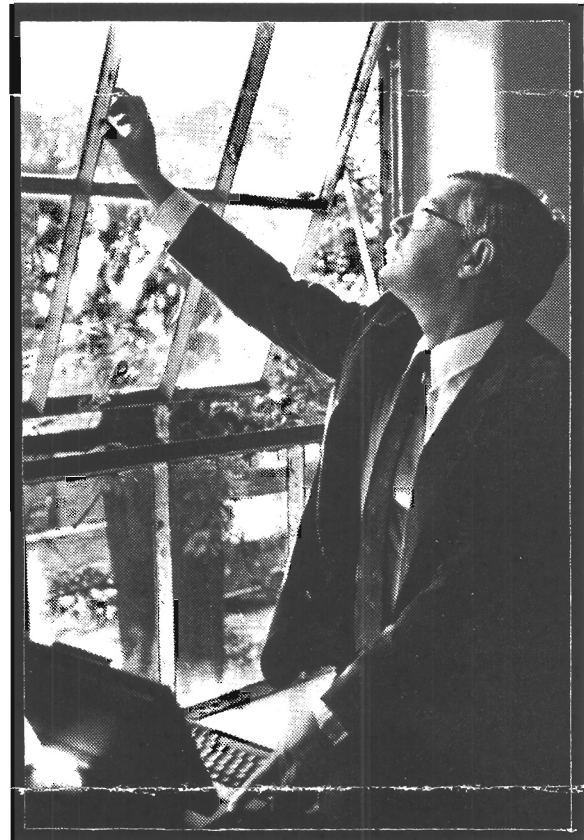
The latest in expert systems may provide a key to preserving the oldest and rarest of windows in historic buildings, while alleviating dilemmas caused by a nationwide shortage of historic preservation experts, a Georgia Tech researcher says.

Director John Myers and his staff at Tech's Center for Architectural Conservation are testing the use of expert systems and artificial intelligence in assessing the importance of windows in historic structures.

"The system is designed to assist people in evaluating windows -- what condition they are in and what one should do with them from a philosophical point of view," Myers explained. "There are not enough historic preservation experts to meet existing needs. People need technical assistance. If we can provide it effectively with small expert systems, perhaps we can avoid the loss of historic buildings."

The program potentially could make it easier for its chief sponsors, the U.S. Army Construction Engineering Research Laboratory (CERL) and the U.S. Army Engineering and Housing Support Center (EHSC) -- and other owners of older structures -- to preserve buildings' character and value while adapting them to new uses, Myers noted.

The system, which links two different



John Myers examines a window, gathering data to enter into an expert system that will evaluate the window's condition. (Color Slides/B&W Available)

FOR MORE INFORMATION:

ASSISTANCE/PHOTO: Lea McLees or John Toon, (404) 894-3444

RESEARCHER: John Myers, (404) 894-3390

WRITER: Lea McLees

computer programs and can be used with any IBM-compatible machine, is easy to operate. The user simply answers a series of questions posed one after another on the computer screen: What is the building's architectural style? What are the measurements of the window in question? How many panes of glass are in each window sash? Are any parts broken or missing?

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The computer uses the answers to these and other questions to determine how important the window is to the building. Among the 10 factors considered are whether the window is original, the quality of its craftsmanship and its appropriateness to the structure.

The expert system relies on information gathered by the center's staff, recognized nationally for its expertise on windows; THE WINDOW HANDBOOK, a guide the staff compiled with the National Park Service; and directives from the U.S. Department of the Interior.

If the user indicates that the window in question is completely missing, he gets an immediate computer response telling him whether to replace it with an exact replica or a cheaper, but similar, window. Otherwise, the computer continues asking questions in finer and finer detail to gather data on the window's condition.

The window evaluation program is the first expert system set up for use in historic preservation, Myers said. The system could be used by anyone who owns or manages primarily historic buildings, including a number of government agencies and city and state governments and universities.

One of the system's main values is helping personnel identify important design issues early in the planning process. This streamlines projects and avoids delays that could result if problems were identified in later phases, Myers said.

The project is part of ongoing efforts by CERL and EHSC to help military bases comply with federal regulations on preserving cultural resources, said Michael Golish, CERL principal investigator for the project.

"It's not only our policy to maintain the building's architecture -- it just makes good sense to optimize the use of these buildings within the Army inventory," Golish explained. "We believe tools like the expert system will make it easier for military bases to do this."

Developing software that can help solve historic preservation problems to some degree is an alternative to simply allowing remodeling or demolition to take place with no assistance, possibly damaging historic buildings around the

country, Myers noted.

"There are close to 100 million buildings in the United States. Many are older and historic and many have problems," he explained. "If you do the wrong thing, it may cause serious problems later. But if you do the right thing, it saves time and money, as well as producing better results."

The researchers working with the program have demonstrated that it can work faster graphically, allowing the user to build a picture of the window and its condition in the computer and print out copies of the drawing.

"The advantage is that most people who work with buildings are used to working with drawings or elevations," he said. "A drawing can also be understood quicker and is more useful in the planning and design process."

Myers would like to link the current window evaluation program to a list of experts, skilled craftsmen and others who can build windows of certain types and sizes, for example.

The center was set up in 1982 to address the critical difficulties of disseminating historic preservation information and guidelines. Its personnel help government agencies assess and plan for the upkeep of older and historic buildings and develop databases of information on each structure. Much of the center's work has been done for the National Park Service, the General Services Administration, the U.S. Courts and the U.S. Army.

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