University of Illinois at Urbana-Champaign NEWS

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CHAMPAIGN. Ill. - Interactive, real-time magnetic resonance imaging (MRI) can now be done on the World Wide Web by using "NWebScop"-state-of-the-art instrumentation developed at the University of Illinois. With universally available browser software, researchers anywhere can conduct experiments from their desktop or laptop computer.

The interactive MRI system-know as NmrScope-is available on the Web through NWebScope, a server at the U.of I. The innovation could lead to the creation of similar interactive networks at other institutions, extending the technology to link-ups with microscopes, telescopes and other analytical instruments, developers said.

NmrScope provides simple on-screen instructions that allow remote users to review and modify experimental conditions for observations of objects in an MRI system. The resulting images are displayed on screen as soon as they are produced.

"This new MRI technology could lead to collaborative research involving plant and animal biology, including microscopy, histology and function," said Paul C. Lauterbur, director of the U.of I. Biomedical Magnetic Resonance Laboratory. "It also could be used in opposite materials research and clinical examinations. We hope our example will stimulate similar work in other MRI laboratories and in other fields."

Scientists Carl Gregory and Clint Potter of the U.of I. College of Medicine at Urbana-Champaign and the National Center for Supercomputing Applications (NCSA), working at the U. of I. Beckman Institute for Advanced Science and Technology with funding from the Division of Research Resources of the National Institutes of Health, have linked standard commercial MRI system components (manufactured by Surrey Medical Imaging Systems and Magnex Scientific) with an IBM RS-6000 workstation and software produced at the U.of I. to create NwebScope.
(MORE-MRI On Line)

The U.of.1.researchers who developed the interactive MRI system also foresee adapted application of the technology to observations in space, undersea and in other distant or dangerous environments. Education at all levels also could benefit by safe and easy student access to specialized laboratory facilitates, Lauterbur said.

"This system demonstrates that the World Wide Web can be used for interactive experiments-and in real time," Lauterbur said. "By collaborating with a center having the proper equipment, a researcher can easily carry out appropriate projects without having to invest in the latest hardware or travel to a distant site. This will permit smaller companies and academic labs to take advantage of new technology."

An authorized researcher, who must first arrange for a sample to be delivered to the U.of L or provided to the university by a nearby collaborator for analysis, can connect to the server by entering its universal resource locator (URL) in a web browser. The experimenter then sees of form showing the instrument settings and a menu of possible functions, such as "move slice forward,""zoom in,""zoom out,""pan," etc. After choosing the desired conditions, the researcher clicks a screen button and the experiments is carried out. A resulting image is returned to the researcher's computer screen, allowing immediate decisions on next steps to be taken, including downloading the image for later analysis.

Instead of having to purchase expensive state-of-the-art MRI systems-especially complex ones capable of imaging composite materials, microscopic samples, or moving objects-researchers can do their research using inexpensive web-browsing software, such as NCSA Mosaic™ or Netscape™, and pay only the usual usage fee on the MRI system.

More information can be obtained from the World Wide Web URL (http://bmrl.med.uiuc.edu:8080) and from Lauterbur, who can be reached at the U.of 1 Biomedical Magnetic Resonance Laboratory, 1307 W. Park St., Urbana, IL 61801; fax: (217) 244-1330;e-mail: bmrl@bmrl.med.uiuc.edu.