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## 2010-01-28: Images in a flash

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## Images in a flash



Professor Kaeli, holding a computer graphics processing unit, is leading the research project. Photo by Craig Bailey.

**January 28, 2010**

Northeastern University engineering faculty members are leading the development of novel software solutions to accelerate the processing of biomedical images of human tissues. The new software libraries would allow clinicians to process and display images at rates 10 to 1,000 times faster than current technology, which could lead to quicker diagnoses for cancer and certain other conditions and decrease the need for multiple patient visits.

David Kaeli and Miriam Leeser, professors of electrical and computer engineering, are collaborating with researchers from Massachusetts General Hospital and other research institutions in the United States and Puerto Rico. The project, funded by a \$1.3 million Innovations grant from the National Science Foundation (NSF), is affiliated with Northeastern's NSF engineering research center, the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems.

In one key application, the new software libraries would enable radiologists to assess tissue images more quickly so that clinicians could perform image-guided biopsies. This technology could potentially lead to quicker breast cancer diagnoses, quicker detection of cardiovascular plaque, and more rapid delivery of information necessary for brain surgery and radiation treatment planning.

"This emerging technology could help reduce health-care costs by reducing the number of patient visits," said Kaeli. "This also has the potential to become available in clinics and other health-care centers so that more patients can benefit."

The new software libraries will also allow medical researchers to take full advantage of the most sophisticated imaging technologies. Up to now, those technologies produced much more data than existing software was able to process. The software libraries being developed by Kaeli's team will align with computer graphics processing units that are programmed for supercomputing and lightening-fast processing of 3D, Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) images.

The project also includes the development of a web-sharing software library. The software will be applicable to both cancer-related and other biomedical imaging applications.

"Our goal is to develop the methodology that can be reused across all areas of biomedical imaging," explained Kaeli.

Kaeli's collaborators include Miriam Leeser from Northeastern; Badrinath Roysam from Rensselaer Polytechnic Institute; Nayda Santiago from the University of Puerto Rico, Mayagüez; Homer Pien from Massachusetts General Hospital; James Hale from Spelman College; and Clem Karl from Boston University.

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