

Project Year

Spring 2009

Project Title

Medical Imaging Science Course Resources - SMILE

Project Team

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Audience

Students in *Medical Imaging Science* (spring, 2009), a new course proposed by faculty member

Pedagogical Issue

The top-ranked Biomedical Engineering department at Johns Hopkins offers a number of excellent theoretical courses in medical imaging and signal processing. However, the department lacks a practical/applied course in image analysis. Students previously gained practical experience through one-on-one internships with research faculty. These are wonderful opportunities, but they tend to be rather narrowly focused.

Solution

This technology fellowship project proposes to improve and develop resources for a new, capstone course in medical imaging science. This course will offer students a unique opportunity to unite their experiences in statistics, programming and medical imaging in a project-oriented setting. To succeed, students in the class will need the tools and framework of an industrial-class software development environment, however, configuration of these resources is a daunting task and support of these tools for beginning students on varied computer systems would be all but impossible in a classroom environment. Dr. Landman developed a unique solution to this problem with a modular virtualized development environment named SMILE (Statistical Medical Image Laboratory Environment). The project team tested, modified, and documented this tool to make it accessible to students in the class.

Technologies Used

MatLab, Adobe Acrobat, PowerPoint, Virtual Computing, Medical Image Analysis Software

Project Abstract

Johns Hopkins is world renowned for medical imaging both in the context of applied research (clinical medicine and neuroscience) and physics and engineering sciences. The undergraduate biomedical engineering (BME) curriculum reflects this expertise through courses in signal processing, medical imaging systems, magnetic resonance imaging, and numerous upper level seminars. The existing

signal/image processing courses, however, are strongly theoretical and do not provide students with many opportunities for hands-on exploration of imaging science concepts. The faculty developed a new course in medical imaging uniting statistics, programming and medical imaging in a project-oriented setting. The technology fellowship team developed and improved computational resources for the course. Specifically, the fellows improved a virtual development environment created by the professor to provide students access to pre-configured state of the art development tools. All material will be released in open source through the Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC), an NIH funded repository.