JOHNS HOPKINS
BIOMEDICAL ENGINEERING

Monday April 20, 2009, 1:00 PM, Clark 110
Light lunch will be provided at 12:15 in Clark 110

Anatomical Structure Analysis: Computer Vision Techniques for Segmentation, Shape Variation, and Population Analysis

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Hosted by Dr. Rene Vidal

Accurate reconstructions of anatomical structures and measurement of their physiological properties from patient images can greatly aid in many medical scenarios: guiding surgical procedures for tissue resection with minimal collateral damage; identifying significant changes in shape between normal and diseased populations; and tracking temporal changes in structures during development or in response to treatments. Novel computer vision and machine learning techniques are providing robust, automated tools to recover detailed models of a wide range of anatomical structures, especially in the brain. Segmentation tools learn statistical models of structure appearance, spatial layout, and shape, and use them to guide the extraction of subtle anatomical structures from new imagery. Clustering methods model variations in shape and appearance of structures within individual subjects and across populations of subjects, and use these variations to isolate significant differences between populations. The utility of these methods will be demonstrated in applications of image-guided surgery, as well as population studies from schizophrenia, multiple sclerosis and other diseases.

Biographical Sketch:

Eric Grimson is a Professor of Computer Science and Engineering at the Massachusetts Institute of Technology, and holds the Bernard Gordon Chair of Medical Engineering at MIT. He also holds a joint appointment as a Lecturer on Radiology at Harvard Medical School and at Brigham and Women's Hospital. He is currently serving as the Head of the Department of Electrical Engineering and Computer Science at MIT. He received a B.Sc. (High Honors) in Mathematics and Physics from the University of Regina in 1975 and a Ph.D. in Mathematics from MIT in 1980. Prof. Grimson's research interests span computer vision and medical image analysis, including systems for activity and behavior recognition, object and person recognition, image database indexing, image guided surgery, computational anatomy, three-dimensional reconstruction, image registration, and many other areas of computer vision. Prof. Grimson is a Fellow of the American Association for Artificial Intelligence (AAAI), a Fellow of the IEEE, and was awarded the Bose Award for Excellence in Teaching in the School of Engineering at MIT.

For more information call 410-516-3826