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Presents

Xiaodong Wu, University of Iowa

Enabling Graph Techniques for Medical Imaging Segmentation

Following a revolution in medicine that was caused by widespread availability of volumetric imaging scanners, there is a continuing need to efficiently and fully analyze the large amounts of medical image data generated by the acquisition devices when used for routine clinical care. The increasing sizes of image data, especially in 3-D and higher dimensions, present a significant challenge to conventional approaches for automated biomedical image analysis, which has often been a difficult or even unrealistic process due to its time-consuming and labor intensive characteristics.

Image segmentation, the problem of identifying objects of interest in volumetric image data, is a fundamental problem in biomedical image analysis and computer-aided diagnosis. Robust, efficient, and accurate automated segmentation methods are highly desirable for numerous biomedical studies and applications. In this talk, we present effective image segmentation techniques based on enabling graph algorithms for detecting biomedical objects in 3-D and higher dimensional images. In comparison with most known segmentation methods that suffer from their inability to attain globally optimal segmentation or lengthy computation time, our techniques produce, in an efficient manner, segmentation of optimal quality with respect to general cost functions on a wide range of biomedical objects with complex topological structures. Examples and segmentation results on various medical image datasets are shown.

Bio: Xiaodong Wu received the BS and MS degrees both in computer science from Peking University, China, in 1992 and 1995, respectively, and the PhD degree in computer science and engineering from the University of Notre Dame in 2002. He is currently an Associate Professor in the Departments of Electrical and Computer Engineering and Radiation Oncology at the University of Iowa. His research interests are primarily in the areas of computational biomedicine, biomedical imaging, computational geometry, and algorithms. He has published many papers in these areas, and holds several US patents on technical inventions for radiation cancer treatment and biomedical imaging. Dr. Wu is a recipient of the NSF CAREER Award (2009) and the NIH K25 Career Development Award (2007).

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