

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Zeyun Yu**

( *Department of Computer Science,*

*University of Wisconsin – Milwaukee, USA* )

报告题目:

**Adaptive Mesh Representation and  
Processing of Biomedical Images**

邀请人: 徐国良研究员, 陈冲博士

报告时间: **2014 年 9 月 10 日 (周三)**

**上午 10:00-11:00**

报告地点: **数学院南楼七层 702**

**会议室**

## **Abstract:**

**Biomedical imaging technologies are now widely used in many aspects of science and engineering. Images acquired or computed are commonly digitized into two- or three-dimensional (2D or 3D) regular arrays composed of pixels or voxels respectively. Despite its ease of use and processing on computers, this type of image representation often contains a lot of information redundancy, which poses great challenges to data storage and transmission especially with rapidly increasing resolutions of digital images and growing availabilities of volumetric images. In addition, many pixel-based image processing and analysis algorithms require at least linear time complexity with respect to the number of pixels in an image. Increasing image sizes can become a bottleneck in many real-time applications such as patient diagnosis and remote healthcare systems. For these reasons, finding other image representations that allow less storage space and faster processing speed would be important.**

**In this talk, I shall present an approach to representing images with irregular meshes. Compared to the traditional pixel-based method, the new representation provides a significantly more compact way to describe an image, which is well suited to storing and transferring large imaging data. The mesh structure of an image is adaptively defined with finer elements near image features. A method will also be presented to restore the pixel-based image with an arbitrary resolution from the mesh representation.**

## **Short Biography:**

Dr. Zeyun Yu received his B.S. in mathematics from Beijing University and Ph.D. in computer science from University of Texas at Austin. He is currently an associate professor in the Department of Computer Science at the University of Wisconsin – Milwaukee (UWM). He established and currently direct the Biomedical Modeling and Visualization lab at UWM. His research, primarily supported by National Institute of Health, involves generating high quality computer simulations and models of biological structures using advanced image processing, computer graphics, and scientific computing methods. Since 2012, Dr. Yu has been serving as an associate editor of the *Journal of Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization*, and on the editorial boards of three other journals. He has co-organized several sessions in international and domestic workshops on image and geometric processing, and has been on the program committees of over ten conferences. Dr. Yu has been an invited reviewer of nearly 30 journals, for his internationally recognized research work published in ~65 journals, conferences or book chapters.

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