

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 Electrical Engineering and Computer Science, University of*

Wisconsin - Milwaukee, USA)

报告题目:

**3D Computer Vision: Modeling and
Analysis in Biomedicine**

邀请人: 陈冲 博士

报告时间: **2019 年 1 月 16 日 (周三)**

上午 10:00-11:00

报告地点: 科技综合楼三层

311 报告厅

Abstract:

Knowing 3D anatomical structures and surface geometries is clinically critical for patient treatment and equally important for scientific research. While imaging has been widely used in clinical and research labs, imaging devices are often equipped with cameras capturing only 2D views of the underlying objects. In this talk, I shall begin with an overview of computer vision and then introduce a couple of techniques that reconstruct 3D models from a series of 2D images. In particular, I will elaborate on two types of 3D reconstruction: surface geometries with reflective rays and volumetric structures with transmissive rays. I will then discuss about 3D image and shape analysis with both traditional (model-based) and machine learning (data-driven) approaches. Several applications will be demonstrated to show the efficiency and effectiveness of 3D modeling and analysis in biomedicine: 3D microscopic models through 2D scanning electron microscopy (SEM) images, high-resolution 3D modeling of teeth by active projector/camera systems, and 3D reconstruction of macromolecular structures through cryo-electron microscopy.

报告人简介:

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 Electrical Engineering and 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 3D computational 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 several 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 numerous conferences. He has published research work in more than 100 journals, conferences or book chapters, and has been an invited reviewer for over 40 journals.

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