

# Electrical Engineering and Computer Science

## SOLID STATE & PHOTONICS DIVISION(SSP)

### Title: Dynamic 3D Mosaics for Urban Scene Modeling and Target Detection

Thursday,

11/12/09

Time: 10:30am

Room: TECH A230

Speaker:

Prof. Zhigang Zhu,

City College, City

University of New York

*The SSP division contains faculty whose main research interests include the design, analysis, and proof-of-concept development of solid-state and photonic devices and systems.*

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#### Abstract:

We propose a content-based 3D mosaic (CB3M) representation for an urban 3D and dynamic scene recorded by a camera on a ground or aerial mobile platform. The content-based 3D mosaic (CB3M) representation is a highly compressed visual representation for a very long video sequence of a dynamic 3D scene. For a real image sequence of a campus scene, with 1000 frames of 640\*480 color images, a compression ratio of a few thousands to more than ten thousand can be achieved, depending on what levels of details are preserved. More importantly, the CB3M representation has object contents of both 3D and motion information, allowing further automated target recognition, indexing and retrieval. In this talk, I will describe the two important steps in generating the CB3M representations: 3D registration/ mosaicing under motion parallax, and segmentation-based stereo matching of multiple pushbroom mosaics. Experimental results and video demos will be shown for the CB3M representation construction of both simulated and real-world scenes.

#### Biography:

Dr. Zhigang Zhu is currently a Professor in the Computer Science Department, the City College of New York. He directs the City College Visual Computing Laboratory (CcvCL), and co-directs the Center for Perceptual Robotics, Intelligent Sensors and Machines (PRISM) in Grove School of Engineering at CCNY. Previously he has been an Associate Professor at Tsinghua University, and a Senior Research Fellow at the University of Massachusetts, Amherst. His research interests include 3D computer vision, multimodal sensing, Human-Computer Interaction (HCI), video representation, and various applications in education, environment, robotics, surveillance and transportation. Dr Zhu is a senior member of the IEEE, a senior member of the ACM and an Associate Editor of the Machine Vision and Applications Journal. He was Co-General Chair (with Prof. Thomas S. Huang) of the 2007 IEEE Workshop on Multimodal Sentient Computing, in conjunction with CVPR 2007 in Minneapolis, Minnesota, and Co-Guest Editor (with Prof. Takeo Kanade) of the Special Issue on Modeling and Representations of Large Scale 3D Scenes, International Journal of Computer Vision, 2008.



