

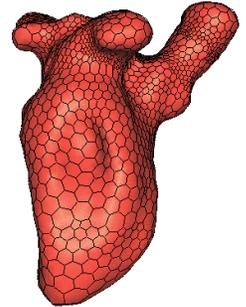
# Visual Modeling and Reconstruction

## Organizers & Chairs: Shree Nayar, Jean Ponce

**Sensors for Robot Vision**  
Shree Nayar  
Columbia University

**Surface Simplex Meshes for 3D Medical Image Segmentation**  
J. Montagnat, H. Delingette, N. Scapellato and N. Ayache  
INRIA, Sophia-Antipolis

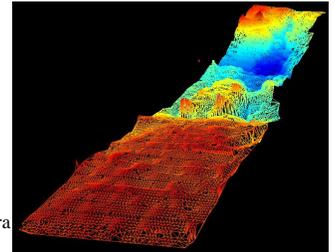
- Deformable surface based modeling and segmentation of 3D medical images
- Shape and global regularizing constraints, adaptable topology, automatic initialization
- CT, MRI and US images segmentation
- Fast and robust 3D images segmentation



**Constructing Geometric Object Models From Images**  
J. Ponce, Y. Genc and S. Sullivan  
University of Illinois

**Terrain Reconstruction for Ground and Underwater Robots**  
R. Mandelbaum, G. Salgiano, H. Sawhney and M. Hansen  
Sarnoff Corporation

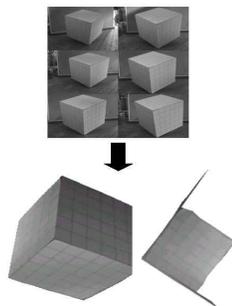
- New image-processing for egomotion and terrain structure recovery
- Correlation-based, iterative, multi-resolution approach
- Suited for outdoor ground-based and underwater scenes
- Can accommodate both single-camera and multiple-camera rigs



**Self-calibration using the linear projective reconstruction**  
J. E. Ha<sup>1</sup>, J. Y. Yang<sup>2</sup> and I. S. Kweon<sup>1</sup>

<sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST) and  
<sup>2</sup>Samsung Electronics Co.

- Self-calibration algorithm that only requires a linear projective reconstruction
- Linear initialization method based on the property of the absolute quadric
- Adding another constraint on the principal point to improve robustness to the image noise



**3-D Map Reconstruction from Range Data**  
Daniel Huber, Owen Carmichael and Martial Hebert  
Carnegie Mellon University

- Building large 3-D maps from sensor data
- Matching 3-D patches using local signatures for registration of partial views of the environment
- The techniques have been applied to 11 different sensors (passive and active) and has been used for building models of individual objects, indoor environments, large terrain maps, and sonar maps

