KEYNOTE TALK

Wednesday, December 16, 2015
1:30 PM– 2:30 PM / Ballroom 5

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Back to the Drawing Board: Extracting 3D Drawings from Multiview Imagery

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Abstract

The three-dimensional reconstruction of scenes from multiple view geometry has made impressive strides in recent years, chiefly by methods correlating isolated feature point and intensities across views. In the general setting, i.e., without requiring controlled acquisition, limiting the number of objects, or requiring patterns on objects, the vast majority of these methods produce unorganized point clouds, meshes, or voxel representations of the reconstructed scene. Many applications, e.g., robotics, urban planning, and industrial design, however, require structured representations, which make explicit 3D curves, 3D surfaces, and their spatial relationships. We present an approach to produce a **3D drawing** of a scene, i.e., a set of 3D curve fragments together with their spatial relations captured in the form of a graph, from a large set of multiview data. The 3D drawing is complementary to extracting surface representations which can now be constrained by the 3D drawing acting like a scaffold to hang on the computed representations, leading to increased robustness and quality of reconstruction. The integration of curve geometry is a promising direction for multiview reconstruction.

Speaker Bio-Sketch: Benjamin Kimia is a Professor in the Department of Electrical Sciences and Computer Engineering at **Brown University** School of Engineering. He is also the associate director of the Laboratory for Engineering Man/Machine Systems (LEMS), an interdisciplinary group focused on signal and image processing, control, multimedia, and computer engineering. Dr. Kimia received the B.Eng. Honors degree from McGill University, Montreal, Canada in 1982, followed by M. Eng. (1986) and Ph.D. (1991) degrees in the areas of Computer Vision and Image Processing. Prof. Kimia's current research interests are focused on mathematical, psychophysical, and computational models for visual processing with applications to assistive devices for the visually impaired, medical imaging, animal behavior analysis, digital archaeology. His research program is based on skeletal representations of shapes and images, multiview reconstructions based on differential geometry, etc.