Department of Computer Science and Engineering

Distinguished Speakers Series Presents

The Three R's of Computer Vision: Recognition, Reconstruction and Reorganization

Jitendra Malik, UC Berkeley

Over the last two decades, we have seen remarkable progress in computer vision with demonstration of capabilities such as face detection, handwritten digit recognition, reconstructing three-dimensional models of cities, automated monitoring of activities, segmenting out organs or tissues in biological images, and sensing for control of robots and cars. Yet there are many problems where computers still perform significantly below human perception. For example, in the recent PAS. CAL benchmark challenge on visual object detection, the average precision for most 3D object categories was under 50%.

I will argue that further progress on the classic problems of computational vision: recognition, reconstruction and re-organization requires us to study the interaction among these processes. For example recognition of 3d objects
benefits from a preliminary reconstruction of 3d structure, instead of just treating it as a 2d pattern classification problem. Recognition is also reciprocally linked to reorganization, with bottom up grouping processes generating candidates, which combine with top-down activations of object and part detectors. In this talk, I will show some of the progress we have made towards the goal of a unified framework for the 3R's of computer vision. I will also point towards some of the exciting applications we may expect over the next decade as computer vision starts to deliver on even more of its grand promise.

Jitendra Malik was born in Mathura, India in 1960. He received the B.Tech degree in Electrical Engineering from Indian Institute of Technology, Kanpur in 1980 and the PhD degree in Computer Science from Stanford University in 1985. In January 1986, he joined the university of California at Berkeley, where he is currently the Arthur J. Chick Professor in the Computer Science Division, Department of Electrical Engg and Computer Sciences. He is also on the faculty of the department of Bioengineering, and the Cognitive Science and Vision Science groups. During 2002-2004 he served as the Chair of the Computer Science Division and during 2004-2006 as the Department Chair of EECS. He serves on the advisory board of Microsoft Research India, and on the Governing Body of IIIT Bangalore.

Prof. Malik's research group has worked on many different topics in computer vision, computational modeling of human vision, computer graphics and the analysis of biological images, resulting in more than 150 research papers and 30 PhD dissertations. Several well-known concepts and algorithms arose in this research, such as anisotropic diffusion, normalized cuts, high dynamic range imaging, and shape contexts. According to Google Scholar, seven of his papers have received more than a thousand citations each, and he is one of ISI's Highly Cited Researchers in Engineering.

He received the gold medal for the best graduating student in Electrical Engineering from IIT Kanpur in 1980 and a Presidential Young Investigator Award in 1989. At UC Berkeley, he was selected for the Diane S. McEntyre Award for Excellence in Teaching in 2000, a Miller Research Professorship in 2001, and appointed to be the Arthur J. Chick Professor in 2002. He received the Distinguished Alumnus Award from IIT Kanpur in 2008. He was awarded the Longuet-Higgins Prize for a contribution that has stood the test of time twice, in 2007 and in 2008. He is a fellow of the IEEE and the ACM, and a member of the National Academy of Engineering.

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3:30–4:30 PM

University at Buffalo- North Campus – Davis 101

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