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

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Abstract
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 PASCAL 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 could benefit 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 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.

Biography
Jitendra Malik received the B.Tech degree in EE from Indian Institute of Technology, Kanpur in 1980 and the PhD degree in CS from Stanford University in 1985. In January 1986, he joined UC Berkeley, where he is currently the Arthur J. Chick Professor in the Department of EECS. 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. Prof. Malik's research group has worked on computer vision, computational modeling of human vision, computer graphics and the analysis of biological images.

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