

KEYNOTE TALK
Monday, November 30, 2009
8:30AM – 9:30AM / Ballroom 4-5

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An engineer's exploration of human visual recognition

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Abstract

Engineers attempting to understand visual recognition may learn useful lessons by probing the human visual system. I will describe experiments designed to investigate the computational constraints, speed and versatility of human visual recognition. The main findings are that (a) complex categorization tasks are likely to be accomplished using a fast feed-forward architecture, (b) many categorization tasks appear to be carried out in parallel, (c) not all categorization tasks are the same, some requiring more computational resources than others, (d) humans viewing a scene attach different levels of 'importance' to different objects; object importance may be in part, but not entirely, predicted using bottom-up image cues. [In collaboration with FeiFei Li and Merrielle Spain]



Speaker Bio-Sketch: Dr. Pietro Perona is the Allen E. Puckett Professor of Electrical Engineering at Caltech. He directs Computation and Neural Systems (www.cns.caltech.edu), a PhD program centered on the study of biological brains and intelligent machines. Professor Perona's research centers on vision. He has contributed to the theory of partial differential equations for image processing and boundary formation (anisotropic diffusion), and to modeling the early visual system's function. He is currently interested in visual categorization and visual recognition. Dr. Perona received a 'Laurea in Ingegneria Elettronica' from the Università di Padova, Italy in 1985 and a PhD in Electrical Engineering and Computer Science from the University of California at Berkeley in 1990. He was a post-doctoral fellow at the LIDS laboratory of MIT in 1990-91 and joined Caltech as an Assistant Professor in 1991.