

Signal Processing Seminar

Title: Locally Adaptive Kernel Regression: A non-Parametric Framework for Visual Signal Processing and Recognition

Speaker: Professor Peyman Milanfar
University of California, Santa Cruz

Date: Wednesday, September 16, 2009

Time: 4:00 - 5:00 pm

Where: 4269 Beckman Institute

Abstract: I will present a non-parametric framework based on the notion of Kernel Regression which we generalize to adapt to local characteristics of the given data, resulting in descriptors which take into account both the spatial density of the samples ("the geometry"), and the actual values of those samples ("the radiometry"). These descriptors are exceedingly robust in capturing the underlying structure of the visual signals even in the presence of significant noise, missing data, and other disturbances. As the framework does not rely upon strong assumptions about noise or signal models, it is applicable to a wide variety of problems. On the processing side, I will illustrate examples in two and three dimensions including state of the art denoising and upscaling. On the vision side, I will describe the novel application of the framework to object and action detection/recognition in images, and in video, respectively, from a single example.

Speaker Bio: Peyman Milanfar received the B.S. degree in electrical engineering/mathematics from the University of California, Berkeley, in 1988, and the S.M., and Ph.D. degrees in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1990, and 1993, respectively. Until 1999, he was a Senior Research Engineer at SRI International, Menlo Park, CA. He is currently Professor of electrical engineering at the University of California, Santa Cruz. He was a Consulting Assistant Professor of computer science at Stanford University, from 1998–2000, and a visiting Associate Professor there in 2002. His technical interests are in statistical signal and image processing, and inverse problems. Prof. Milanfar won a National Science Foundation CAREER award in 2000. He is an Associate Editor of the IEEE TRANSACTIONS ON IMAGE PROCESSING and was an Associate Editor for the IEEE SIGNAL PROCESSING LETTERS from 1998 to 2001. He is a member of the Signal Processing Society's Image, Video and Multidimensional Signal Processing (IVMSP) Technical Committee.

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