Arthur Imperatore School of Sciences and Arts

Department of Mathematical Sciences

Seminar in Stochastic Systems

Dr. Spiridon Penev

Department of Statistics, School of Mathematics
The University of New South Wales, Sydney, Australia

Wavelet Estimation with Multiple Sampling Rates

Tuesday, November 11, 2003
4:00 pm
Pierce 218

Abstract: We present an adaptive algorithm for obtaining information from noisy signals using wavelet methods. The method can be used for online signal recovery, when the signal is sampled at discrete times and the estimator is transmitted after a relatively short time delay. The algorithm involves increasing the sampling rate when higher-frequency terms are incorporated into the wavelet estimator, and decreasing it when, using the size of the empirical wavelet coefficients as a guide, signal complexity is judged to have decreased. This allows to accurately recover relatively complex signals without increasing the long-run average sampling cost. We illustrate the advantages of the algorithm numerically and formulate statements related to the ability of the dual-rate sampler to consistently estimate high-frequency parts of the signal that would not be accessible when using a constant-rate estimator with the same long-run average sampling cost.
The results have been obtained in collaboration with Professor Peter Hall (Australian National University, Canberra).

Dr. Spiridon Penev obtained his M.Sc. and Ph.D. degrees in Mathematics from Humboldt-University Berlin, Germany. His research interests are in the area of Wavelets for nonparametric curve estimation, Saddlepoint Approximation Methods, Structural Equation Models, and Inference in semiparametric models. He is the author of more than 50 publications in the area of mathematical statistics. Dr. Penev is a coordinator of the Master of Statistics program at The University of New South Wales, Sydney, Australia.

Refreshments will be served at 3:50 pm.
For more information contact Prof. Darinka Dentcheva at ddentche@stevens-tech.edu or call 201-216-5449.