On the identification of network topologies using Locality properties of Wiener Filters
Dr. Donatello Matersassi
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2:00-3:00 pm
4-178, EECS Bldg
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ABSTRACT: The talk addresses the problem of reconstructing/identifying the topology of a network of interconnected systems from time series data. A variety of techniques based on Wiener Filtering for the reconstruction of different classes of networks (trees, polytrees, self-kin) are introduced. In the assumed model class it will be shown that the Wiener filter is local and sparse. Sufficient and necessary conditions for the correct detection of links will be presented. The problem of identifying an optimal network model with a reduced complexity is also considered showing interesting links with the area of Compressive Sensing.

BIOGRAPHY: Donatello Materassi holds a Laurea in “Ingegneria Informatica” from Universita’ degli Studi di Firenze, Italy, and a Dottorato di Ricerca in Electrical Engineering/Nonlinear Dynamics and Complex Systems from the same institution. During his doctorate he was a visiting scientist at Iowa State University, while in the period 2006-2007 he was awarded post-doctoral fellowships from Universita’ degli Studi di Bologna and Consiglio Nazionale delle Ricerche. He is currently a research fellow in the Department of Electrical Engineering and Computer Engineering at University of Minnesota (Twin Cities). His research interests include nonlinear dynamics, system identification and classical control theory with applications to atomic force microscopy, single molecule force spectroscopy, biophysics, statistical mechanics and quantitative finance.