The FCRH Interdisciplinary Faculty Seminar in Bioinformatics and Big Data
and
The Department of Computer and Information Science
Present

Dr. Asohan Amarasingham
Department of Mathematics
The City College of New York, CUNY

Title: Trial-to-trial variability, nonstationarity, and the interpretation of firing rate in neurophysiology
Date: April 28, 2014
Time: 1:00pm-2:00pm
Location: John Mulcahy Hall Room 302

ABSTRACT: Many experimental studies of neural coding rely on a statistical interpretation of the theoretical notion of a neuron's firing rate. For example, neuroscientists often ask: "Do a population of neurons exhibit more synchronous firing than one would expect from the co-variability of their instantaneous firing rates?" For another example, "How much of a neuron's observed spiking variability is due to the variability of its instantaneous firing rate, and how much to spike timing variability?" But a neuron's theoretical firing rate is not necessarily well-defined. Consequently, neuroscientific questions involving the theoretical firing rate require additional statistical modeling choices; ignoring this ambiguity can lead to inconsistent reasoning. This observation is related to common concerns about the appropriateness of (even mild) stationarity assumptions in neurophysiological data analysis. I will illustrate these issues with examples drawn from the neural coding literature, focusing on 'doubly stochastic' spike train models, and describe some tools and applications that are designed with these concerns in mind.

Speaker Bio: Professor Amarasingham received his Ph.D. in Applied Mathematics from Brown and completed his postdoctoral training in Neuroscience at Rutgers. His current research interests span topics in statistics as well as neural coding and computation, with an emphasis on questions raised by large-scale neurophysiological data sets, and their implications for our understanding of the dynamics and functional properties of neuronal circuits.

***For directions and information, please contact Ms. Palma Hutter at hutter@fordham.edu or 718-817-4480. Parking is available on the Rose Hill Campus.**