Stanford University
Department of Statistics

Departmental Seminar

*** Day and Venue Change ***

4:30pm, Thursday, July 12, 2018
Lane History Corner Bldg 200 Room 034

Refreshments served at 4pm in Sequoia Lounge.

Speaker: Bibhas Chakraborty, *National University of Singapore*

Title: Estimating Optimal Dynamic Treatment Regimes with Shared Parameters

Abstract:

Effective treatment of chronic diseases and disorders typically requires ongoing interventions where clinicians sequentially make therapeutic decisions, adapting the type, dosage and timing of treatment according to evolving patient characteristics. The framework of dynamic treatment regimes (DTRs) formalizes this sequential decision-making process prevalent in clinical practice. A DTR consists of decision rules that recommend how to individualize treatment to patients based on available treatment and covariate history. In many scientific domains, these decision rules are shared across stages of intervention. As an illustrative example, we discuss STAR*D, a multistage randomized clinical trial for treating major depression. Estimating these shared decision rules often amounts to estimating parameters indexing the decision rules that are shared across stages. In this paper, we propose a novel simultaneous estimation procedure for the shared parameters based on Q-learning. We provide an extensive simulation study to illustrate the merit of the proposed method over some competitors, in terms of the treatment allocation matching of the procedure with an oracle procedure, defined as the one that makes treatment recommendations based on the true parameter values as opposed to their estimates. Finally, we analyze the STAR*D data using the proposed method.

About this Speaker: Bibhas Chakraborty is an Associate Professor at the Duke-NUS Medical School, and in the Department of Statistics & Applied Probability at the National University of Singapore (NUS). He is also an Adjunct Associate Professor at the Department of Biostatistics and Bioinformatics at Duke University. Previously he was an Assistant Professor of Biostatistics at Columbia University from 2009 to 2013. He received his Ph.D. in Statistics from the University of Michigan in Ann Arbor under the supervision of Professor Susan A. Murphy in 2009. He was awarded the 2011 Calderone Research Prize for Junior Faculty from Columbia's Mailman School of Public Health, and also the 2017 Young Researcher Award from the International Indian Statistical Association (IISA). His main areas of research are dynamic treatment regimes, adaptive clinical trial designs and bootstrap inference, along with a variety of applications in health and behavioral sciences. Professor Chakraborty wrote the first textbook on dynamic treatment regimes.