Stanford University
Department of Statistics

DEPARTMENTAL SEMINAR
4:15pm, Tuesday, March 17, 2015
*** Note Special Location ***
McCullough Building 04-490 Room 115
Cookies served at 3:45pm, 1st floor Lounge.

Speaker: Michael Sørensen
Department of Mathematical Sciences,
University of Copenhagen

Title: Bridge Simulation and Estimation for Multivariate Stochastic
Differential Equations

Abstract:
New simple methods of simulating multivariate diffusion bridges, approximately and exactly, are presented. Diffusion bridge simulation plays a fundamental role in simulation-based likelihood inference for stochastic differential equations. By a novel application of classical coupling methods, the new approach generalizes the one-dimensional bridge-simulation method proposed by Bladt and Sørensen (2014) to the multivariate setting. A method of simulating approximate, but often very accurate, diffusion bridges is proposed. These approximate bridges are used as proposal for easily implementable MCMC algorithms that produce exact diffusion bridges. The new method is more generally applicable than previous methods because it does not require the existence of a Lamperti transformation, which rarely exists for multivariate diffusions. Another advantage is that the new method works well for diffusion bridges in long intervals because the computational complexity of the method is linear in the length of the interval. The usefulness of the new method is illustrated by an application to Bayesian estimation for the multivariate hyperbolic diffusion model.

The lecture is based on joint work in Bladt, Finch and Sørensen (2014).

References: