MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

Gustavo Didier

Mathematics Department
Tulane University

Probabilistic and inferential aspects of self-similarity in the multivariate and multiparameter settings

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10:20am – 11:10am
Refreshments 10:00am
C405 Wells Hall

Abstract

Scaling phenomena are pervasive in nature and in data. A stochastic process is said to be self-similar (s.s.) when its law scales according to a power $0 < H < 1$, the so-called the Hurst parameter. An example of a self-similar process is the classical Brownian motion. Self-similarity is presently used to model biological diffusion, Internet data traces, water levels of rivers, and many other phenomena of interest.

Self-similarity in higher dimension presents new challenges. These include the theoretical consequences of matrix-scaling, non-identifiability, and their impact on inferential pursuits. In this talk, we will give a broad view of related probabilistic and inferential issues in multidimensional settings. We will describe recent developments for multivariate Gaussian self-similar processes and their extension to the multiparameter (random fields) case, the so-named operator fractional Brownian fields (OFBFs). The analysis will draw upon harmonizable integral representations; the latter will allow us to characterize the symmetry groups and (an) isotropy of OFBFs. We will also discuss a wavelet-based inferential method for multivariate self-similarity.

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