



University
of Manitoba

STATISTICS SEMINAR

Thursday, January 23, 2020
111 Armes Bldg
3:45 p.m.

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“First Passage Time Distributions for Some Jump-Diffusion Processes and Flexible Boundaries”

The first passage time (FPT) plays an important role in many scientific fields, including biology and genetics, epidemiology, economics, finance and insurance, engineering, environmental science, physics, and statistics. However, the computation of the FPT distributions for diffusion processes and general boundaries is a challenging problem because explicit analytic solutions do not exist except for a few special instances. We propose a new approach to calculating the FPT distributions and densities for certain jump-diffusion processes crossing piecewise linear boundaries which can be discontinuous. Using this approach, we obtain explicit expressions for the FPT probabilities and densities, which can be used to approximate the first passage time distributions for general nonlinear boundaries. The numerical computation can be easily done by using the Monte Carlo integration which is straightforward to implement. Some numerical examples are presented for illustration. This is a joint work with Z. Jin and J. Shao.

Light refreshments will be served between 3:15-3:45 p.m. in 318D Machray Hall