UNIVERSITY of WISCONSIN
UWMILWAUKEE
Department of Mathematical Sciences

Dissertation Defense

Khwanchai Kunwai

PhD Graduate Student

Under the Supervision of 'Dr. Chao Zhu'

Friday, April 9th, 2021 @ 10:00am

Online via. Microsoft Teams

Khwanchai Kunwai

UW-Milwaukee Department of Mathematical Sciences

EMS Building, Room E403
3200 North Cramer Street
Milwaukee, Wisconsin 5321
414-229-4836
math-staff@uwm.edu

Regime-Switching Jump Diffusion Processes with Countable Regimes: Feller, Strong Feller, Irruducibility and Exponential Ergodicty

This work is devoted to the study of regime-switching jump diffusion processes in which the switching component has countably infinite regimes. Such processes can be used to model complex hybrid systems in which both structural changes, small fluctuations as well as big spikes coexist and are intertwined. Weak sufficient conditions for Feller and strong Feller properties and irreducibility for such processes are derived; which further lead to Foster-Lyapunov drift conditions for exponential ergodicity. Our results can be applied to stochastic differential equations with non-Lipschitz coefficients. Finally, an application to feedback control problems is presented.

Committee Members:

Prof. Chao Zhu, Prof. Richard Stockbridge, Prof. Suzzane Boyd, Prof. Job Willenbring, and Prof. Wei Wei

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