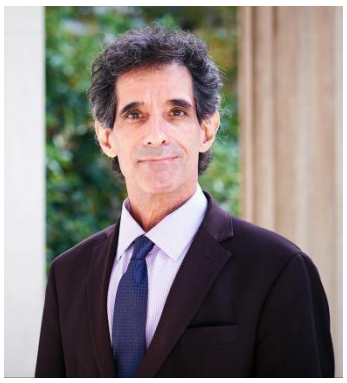
Workshop in Celebrating of Prof. Dr. Soeparna Darmawijaya 86th Birthday: Mathematical Analysis for Statistics

July 10, 2024, 08.00 - 12.30 WIB (Indonesia time), hybrid
Venue: Department of Mathematics, Universitas Gadjah Mada, Yogyakarta, Indonesia



Speaker 1: Prof. Karl Sigman : Columbia University, New York, USA
Title: Introduction to Stochastic Simulation with Applications in Queueing Theory.
https://www.columbia.edu/~ks20/

Abstract
Basic random variable generation; the inverse transform method, acceptance-rejection method. Markov chains & processes. Basic queueing models, simulating exactly from their stationary/limiting distributions: "Coupling from the Past" methods.

Speaker 2: Jayrold P. Arcede, Ph.D., Caraga State University, The Philippines
Title: From Random Walks to Ornstein-Uhlenbeck Process: Exploring Stochastic Processes for Financial and Ecological Modeling
http://linkedin.com/in/jayroldparcede

Abstract
In this workshop, we will explore a range of stochastic processes crucial for modeling real-world phenomena. We'll begin with random walks, fundamental discrete processes whose continuous-time limit is Brownian motion. This transition from discrete to continuous is pivotal in understanding how randomness unfolds in nature.

Using Brownian motion as our foundation, we'll dive into its variations that cater to specific modeling needs:

Brownian Bridge: A constrained form of Brownian motion, traditionally reverting to a terminal value (often zero). We'll apply this to simulate the movement of herds, tracing their paths during daylight and returning to their overnight lodgings.

Brownian Motion with Drift and Volatility: This extension incorporates drift and volatility, better reflecting real-world dynamics. We'll utilize this process to simulate and understand the intricacies of stock price movements.

Geometric Brownian Motion: A process where the logarithm of values follows Brownian motion, making it fundamental in financial modeling, especially for stock prices and option pricing.

Ornstein-Uhlenbeck Process: A mean-reverting process, essential for modeling systems that stabilize over time. We'll use it to simulate population dynamics around carrying capacity, demonstrating both deterministic and stochastic influences.

Join us to uncover how these stochastic processes underpin a wide variety of applications, from finance to ecology, offering insights into the complex interplay of randomness in our world.

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