Data Science Seminar

Hosted by the Department of Mathematical Sciences

- Date: Tuesday, April 26, 2022
- Time: 12:00pm – 1:00pm
- Room: Via Zoom
- Speaker: Dr. Krishnakumar Balasubramanian (UC Davis)
- Title: Fractal Gaussian Networks: A sparse random graph model based on Gaussian Multiplicative Chaos

Abstract

In this talk, I will introduce a novel stochastic network model, called Fractal Gaussian Network (FGN), that embodies well-defined and analytically tractable fractal structures. FGNs are driven by the latent spatial geometry of Gaussian Multiplicative Chaos (GMC), a canonical model of fractality in its own right from probability. FGNs interpolate continuously between the popular purely random geometric graphs (aka the Poisson Boolean network), and random graphs with increasingly fractal behavior. After introducing and motivating the model, I will discuss some statistical questions (e.g., expected motif counts, spectral properties, detecting the presence of fractality and parameter estimation based on observed network data) related to FGNs, and present some preliminary real-world network data analysis.

Biography of the speaker: Dr. Balasubramanian is an Assistant Professor in the Department of Statistics, University of California, Davis. His recent research interests include stochastic optimization and sampling, network analysis and kernel methods. His research was/is supported by a Facebook PhD fellowship, and CeDAR and NSF grants.