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Room 220, Lady Shaw Building, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong

Seminar

Random Concave Functions

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Abstract

Spaces of convex and concave functions appear naturally in applications. For example, convex regression and log-concave density are important in statistics. In stochastic portfolio theory concave functions measure the concentration of capital, and their gradient maps define novel investment strategies. The gradient map may also be regarded as an optimal transport map.

In this work we construct and study probability measures supported on spaces of concave functions. These measures may serve as prior distributions in Bayesian statistics and Cover's universal portfolio, and as distributions over distributions. The random concave functions are constructed on the unit simplex by taking a suitably scaled (mollified, or soft) minimum of random hyperplanes. Depending on the regime of the parameters, we show that as the number of hyperplanes tends to infinity there are several possible limiting behaviors. In particular, there is a transition from a deterministic almost sure limit to a non-trivial limiting distribution that can be characterized using convex duality and Poisson point processes.
Joint work with Peter Baxendale (USC)

Date: 5 December 2019 (Thursday)
Time: 2:30pm – 3:30pm
Venue: Room 219, Lady Shaw Building,
The Chinese University of Hong Kong, Shatin

All are Welcome