Strongly Rayleigh distributions and Applications in Algorithm Design

Shayan Oveis Gharan
University of Washington, USA
shayan@cs.washington.edu

A multivariate polynomial $p(z_1, \ldots, z_n)$ is stable if $p(z_1, \ldots, z_n) \neq 0$ whenever $\Im(z_i) > 0$ for all I. Strongly Rayleigh distributions are probability distributions on Bernoulli random variables whose generating polynomial is stable. They can be seen as a natural generalization of product distributions. It is shown these distributions satisfy the strongest form of negative dependence properties one can consider.

In this talk I will go over basic properties of these distributions, and then I will describe some algorithmic applications.