Analysis Seminar

Empirical measures, geodesic lengths, and a variational formula in first-passage percolation

By

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Abstract: We consider the standard first-passage percolation model on Z^d, in which each edge is assigned an i.i.d. non-negative weight, and the passage time between any two points is the smallest total weight of a nearest-neighbor path between them. Our primary interest is in the empirical measures of edge-weights observed along geodesics from 0 to ne_1. For various dense families of edge-weight distributions, we prove that these measures converge weakly to a deterministic limit as n tends to infinity. These families include arbitrarily small L^infty-perturbations of any given distribution, as well as almost every finitely supported distribution. Analogous results hold for e_1-directed infinite geodesics. Our methodology is driven by a new variational formula for the time constant, which requires no assumptions on the edge-weight distribution. Incidentally, this variational approach allows us to recover and extend a recent result of Krishnan, Rassoul-Agha, and Seppäläinen regarding the convergence of geodesic lengths.

Date: Tuesday, April 21, 2020
Time: 16:00-17:00
Place: ZOOM. To request the event link, please send a message to
goncha@fen.bilkent.edu.tr