THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics#

Probability Theory Seminar

Random walk on dynamical percolation: separating critical and supercritical regimes

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Abstract

In Dynamical Percolation, each edge is open with probability p, refreshing its status at rate $\mu > 0$. This process was introduced in the 1990s by Haggstrom, Steif and the speaker, motivated by a question of Malliavin. Remarkable results on exceptional times in two dimensions were obtained by Schramm, Steif, Garban and Pete. We study random walk on dynamical percolation in the lattice Z^d, where the walk moves along open edges at rate 1. Let $p_c = p_c(d)$ denote the critical value for static percolation. In the critical regime $p = p_c$, we prove that if $d = 2$ or $d > 10$, then the mean squared displacement is $O(t, \mu^a)$ where $a = a(d) > 0$. For $p > p_c$, we prove that the mean squared displacement is of order t, uniformly in $0 < \mu < 1$, refining earlier results obtained with Sousi and Steif. (For $p < p_c$ and $\mu < 1$, it is known that the mean squared displacement is of order $t\mu$.) We will show simulations to illustrate the process. (Joint work with Chenlin Gu, Jianping Jiang, Zhan Shi, Hao Wu and Fan Yang.)

Date:	December 2, 2024 (Monday)
Time:	4:30 – 5:30 pm
Venue:	Room 210, Run Run Shaw Building, HKU

All are welcome