

Large deviations and slowdown asymptotics for excited random walks.

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Excited random walks (also called cookie random walks) are self-interacting random walks where the transition probabilities depend on the number of previous visits to the current location. Using the corresponding "branching process with migration" I will prove a large deviation principle for one-dimensional excited random walks. While most large deviation probabilities decay exponentially fast, when the limiting speed of the random walk is non-zero the "slowdown probabilities" decay subexponentially. The second main result of this talk is the identification of the correct polynomial rate of decay for these slowdown probabilities.

Many previous results for one-dimensional excited random walks have been very similar to the corresponding results for one-dimensional random walks in random environments, and one of the focuses of the talk will be to compare and contrast the main results with the corresponding large deviations and slowdown asymptotics results for random walks in random environments.