$S_t \circ c(h)(a_s)_{ti}c(s) + \mathfrak{S}_e m^i n(a_r)$

Department of Mathematics, University of Utah

Asymptotic behavior of optimal reward on a tree with Gaussian random weights

Shang-Yuan Shiu

University of Utah

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We assign independent and identically distributed Gaussian random variables X_e's to each edge of a tree T. Then we define $S_n^\rho = \sum_{e\in\rho,|e|\le n} X_e$ where $\rho \in \partial T$ and ∂T is a collection of infinite paths from the root and going through no vertex more than once. For convenience we write $M_n := \sup_{\rho\in\partial T} S_n^\rho$ through out. We want to find an appropriate positive sequence $\{a_n\}$ such that $0 < \limsup M_n/a_n < \infty$. Suppose that a tree does not branch slowly ($\liminf_{n\to\infty} \log A_n/\log n > 0$, where A_n is denoted by the number of vertices in the n-th level), then we can choose a_n to be EM_n. If a tree branches slowly, then we should put more weights on a_n. Moreover if $\liminf_{n\to\infty} \log A_n/\log n > 0$ fails, then there exists a tree T for which $\limsup_{n\to\infty} M_n/EM_n = \infty$.