ON THE RATE OF CONVERGENCE OF THE BIGGINS MARTINGALE IN SUPERCRITICAL BRANCHING RANDOM WALKS

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Let $(W_n)_{n\in\mathbb{N}_0}$ denote the Biggins martingale in a supercritical branching random walk which is built on a general point process on $\mathbb{R}$ with, possibly, infinitely many points. Assuming that $(W_n)_{n\in\mathbb{N}_0}$ is uniformly integrable one concludes that

$$\lim_{n\to\infty} W_n = W \quad \text{a.s. and in } L_1 \tag{1}$$

for a nonnegative random variable W which is positive with positive probability.

In my talk which is based on [1, 2, 3, 4] I shall discuss the rate of convergence in (1). Specifically, I am interested in conditions which ensure that the series $\sum_{n\geq 0} e^{an}(W-W_n)$ with $a>0$ converges a.s. or in L_p for $p>1$. A more delicate problem concerns weak convergence of $(W-W_{n+r})_{r\in\mathbb{N}_0}$, properly normalized, in $\mathbb{R}^\infty$ to a Gaussian sequence as well as a corresponding law of the iterated logarithm.

References

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