

Limit theorems for randomly indexed branching processes

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Abstract

Let us have on the probability space $(\Omega, \mathcal{A}, \mathbf{P})$ two independent stochastic processes:

The Bienaymé-Galton-Watson process

$$Z_0 = 1, \text{ a.s. }, \quad Z_{n+1} = \sum_{i=1}^{Z_n} X_i(n+1);$$

The renewal sequence

$$S_0 = 0, \quad S_n = \sum_{j=1}^n J_j, \quad n = 0, 1, \dots,$$

and the corresponding renewal counting process $N(t) = \max\{n \geq 0 : S_n \leq t\}$.

Then the continuous time process $\{Y(t), t \geq 0\}$ defined by

$$Y(0) = 1, \quad Y(t) = Z_{N(t)}, \quad t > 0$$

is called a randomly indexed BGW branching process.

In the talk we give some limit theorems for the process $Y(t)$.

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References

- [1] Mitov, G.K., Mitov, K.V. (2006). *Randomly indexed branching processes*. Proc. of the 35 Spring Conf. of UBM, Borovets, April 5-8, 275–281.
- [2] Mitov, G.K., Mitov, K.V., Yanev, N.M. (2009). *Critical randomly indexed branching processes* (Submitted).