

Defective Galton-Watson processes

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Abstract

This talk is about a special class of Galton-Watson processes, the so-called *defective Galton-Watson processes* and it is based on joint work with Serik Sagitov (Chalmers University of Technology and University of Gothenburg).

The Galton-Watson process is a Markov chain modeling the population size of independently reproducing particles giving birth to k offspring with probability p_k , $k \geq 0$. In [1], we consider *defective* Galton-Watson processes having defective reproduction laws, so that $\sum_{k \geq 0} p_k = 1 - \varepsilon$ for some $\varepsilon \in (0, 1)$. In this setting, each particle may send the process to a graveyard state Δ with probability ε . Such a Markov chain, having an enhanced state space $\{0, 1, \dots\} \cup \{\Delta\}$, becomes eventually absorbed either at 0 or at Δ . Assuming that the process has avoided absorption until the observation time t , we study its trajectories as $t \rightarrow \infty$ and $\varepsilon \rightarrow 0$.

Keywords: branching process; defective distribution; Galton-Watson process with killing; conditional limit theorems.

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References

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