Spinal constructions for continuous space branching processes

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Résumé

We consider branching processes describing structured, interacting populations in continuous time. Dynamics of each individual's characteristics and branching properties can be influenced by the entire population. We propose a spinal construction, and establish a Girsanov-type result. By combining this result with the spinal decomposition, we derive a modified continuous-time version of the Kesten-Stigum theorem that incorporates interactions. Additionally, we propose an alternative simulation approach for stochastic size-dependent populations using appropriate spine constructions.

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