Branching Processes and Stochastic Population Dynamics

Peter Jagers
Chalmers University of Technology
and
University of Gothenburg

Abstract:
After discussion of the concept of a population and its dynamics, we introduce general branching processes as the stochastic theory of population, and shortly mention its ramifications into measure-valued processes. Then we discuss classical single-type Galton-Watson processes and the extinction-or-explosion dichotomy. The question of stabilization of the composition of populations, like the age-distributin is treated in terms of general processes in abstract type space. From this we move on to the time and path to extinction, and to processes in habitats with a carrying capacity, connecting the latter with the adaptive dynamics of biological evolution.