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**Random inheritance in a stochastic Lotka-Volterra model** ULRICH DOBRAMYSL, Department of Physics, Virginia Tech, GABRIEL MARTINEZ, Department of Computer Science, Virginia Tech, UWE C. TÄUBER, Department of Physics, Virginia Tech — We introduce a stochastic two-species Lotka-Volterra predator-prey model that includes random inheritance features. Specifically, each individual particle takes on a predation rate value which is determined when the particle is created and is dependent on the particle's parent. Thus we arrive at a simple model for evolution due to selection pressure. We employ Monte Carlo simulations to study the time evolution of the predation rate distribution as a function of the prescribed variability. We find that this model yields a steady state with optimized rates for both predator and prey species. Contrary to, e.g., gene expression models, the rates do not experience fixation at extreme values. An approximate description of the resulting data is achieved by means of an effective master equation approach for the predation rate distribution.

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