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Sequential Optimal Designs for Estimating Population Dynamics.

Studying population dynamics can assist environmental managers in making better decisions. Traditionally, the sampling of species has been recorded on a regular time frequency. However, sampling can be an expensive process due to financial and physical constraints. Limiting sample size makes it challenging to accurately estimate the population dynamics. Thus, a new and novel approach is proposed to collecting samples based on the dynamics associated with populations of interest. The Lotka-Volterra differential equations are employed to simulate species composition. The goal of this research is to develop a methodology that learns about dynamical systems in a sequential manner and determines an optimal sampling regime for ecologists. (Received September 14, 2020)