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**NUMERICAL SIMULATION OF POPULATION DISTRIBUTIONS  
IN TWO DIMENSIONS**

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Numerical partial differential equation solvers have been used to solve a variety of systems of differential equations, such as those from hydrodynamics and aerodynamics. Here, we apply this technology to population modeling. We begin with the general population model for two species and formulate a system of partial differential equations, where the desirability regions and competition rates vary spatially. We calculate the eigensystem for the convective terms, develop an appropriate method for discretizing the diffusion terms, and implement the governing equations within an existing two-dimensional numerical solver. We consider a two-species competing model and a two species predator-prey model.

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