

MATHEMATICAL MODELS FOR SWARM BEHAVIOR

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Swarm behavior consisting of a large number of individuals often surprises us. They move coherently, matching their velocity without collision and maintaining a constant scale of school, even though they have only moderate ability of information processing and of execution of programming.

Several mathematical models for swarming have been presented on the basis of experimental results concerning interactions between nearby mates which are rather simple. In this talk, I will present our recent work on swarm behavior including

- (i) Mathematical models of stochastic differential equations using local rules of individuals in swarm (e.g., repulsion, attraction, alignment, and reaction to the environment)
- (ii) The effects of noise on swarm behavior
- (iii) Numerical simulations

REFERENCE

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