

Joint Event

APPLIED MATHEMATICS COLLOQUIUM
and
**NUMERICAL METHODS FOR PARTIAL
DIFFERENTIAL EQUATIONS SEMINAR**

Swarming by Nature and by Design

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ABSTRACT:

The cohesive movement of a biological population is a commonly observed natural phenomenon. With the advent of platforms of unmanned vehicles, this occurrence is attracting renewed interest from the engineering community. This talk will review recent research results on both modeling and analysis of biological swarms and also design ideas for efficient algorithms to control groups of autonomous agents.

For biological models we consider two kinds of systems: driven particle systems based on force laws and continuum models based on kinematic rules. Both models involve long-range social attraction and short range dispersal and yield patterns involving clumping, mill vortices, and surface-tension-like effects. For artificial platforms we consider the problem of boundary tracking of an environmental material and consider both computer models and demonstrations on real platforms of robotic vehicles. We also consider the motion of vehicles using artificial potentials.

MONDAY, SEPTEMBER 29, 2008

4:30 PM

Building 4, Room 231

*Reception at 4:00 PM in Building 2, Room 349
(Applied Math Common Room)*

Applied Math Colloquium: <http://www-math.mit.edu/amc/fall08>
Math Department: <http://www-math.mit.edu>



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