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Call for Papers on

Swarm Intelligence and Swarm Robotics

for a special issue of the journal

Neural Computing & Applications

http://www.springer.com/journal/521

Aim and Scope:
Swarm intelligence refers to the phenomenon of a system of spatially distributed individuals coordinating their actions in a decentralized and self-organized manner so as to exhibit complex collective behavior. Such systems tend to have large numbers of individual agents that interact with each other in simple ways. This allows swarm-intelligent systems to be inherently robust and flexible. Moreover, systems with these properties can range in size from the nano to the macro scale.

Swarm-intelligent systems are common throughout nature. Examples are bacteria colonies, social insects, and flocks/herds of vertebrates. In addition, humans have produced a variety of (artificial) swarm systems ranging from swarm-based optimization algorithms to sensor networks, swarms of robots, and smart materials. In each of these natural or artificial systems, populations of agents change their spatiotemporal configuration (in computational space or the real world) solely based on the agents' local interactions with each other and the environment.

This special issue aims to bring together contributions from studies of computational and physical swarm systems which leverage similar swarm-intelligent mechanisms. We thereby intend to help outline a common methodological framework for the design and analysis of swarm-intelligent systems. We are soliciting contributions on (but not limited to) the following topics:

- Applications in swarm robotics (ad-hoc and sensor networks, coverage, actuator arrays, collective construction, etc.)
- Large-scale reconfigurable robot systems, multi-robot systems, self-assembling systems, smart materials
- Modeling natural or artificial swarms and mixed biological / artificial systems
- Swarm-intelligent optimization techniques including Particle Swarm Optimization
- Amorphous Computing, Spatial Computing, Organic Computing, Neural Computing
- Design methodologies for swarm-intelligent systems (global-to-local programming, evolution of swarming algorithms and hardware, etc.)
- Theoretical and empirical analysis and benchmarking (consensus, distributed optimization, flocking, shape changing, task allocation, etc.)

Manuscript Submission:
Authors are encouraged to submit high-quality, original work that has neither appeared in, nor is under consideration by, other journals. Manuscripts should be submitted to: http://nca.edmgr.com/. Please select article type: "Swarm Intelligence and Swarm Robotics".

Important dates:

- **May 1, 2009, Submission deadline**
- August 1, 2009, Notification of acceptance
- October 1, 2009, Revised / Final manuscript

The special issue is expected to be published by Springer early 2010.

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