



What is Computational Swarm Intelligence?

A Special Session of the 2009 IEEE Congress on Evolutionary Computation, Trondheim, Norway, May 18-21, 2009

Swarm Intelligence (SI) algorithms, often inspired by communication and interaction between social agents such as ants or bees share much in common with EA's. However the precise relationship remains vague and ill-defined.

Are there any principles underlying and distinguishing the behaviour of swarm algorithms?

The session will gather experts in adjacent and seemingly related fields of

- Swarm Intelligence,
- Artificial Immune Systems
- Multi-agent systems

in order to discuss issues such as overlaps between algorithms, their compatibility, and their essential differences as problem solvers.

Previous research directions have looked towards Physics and, in particular, Biology for new ideas. This session proposes that Computational Swarm intelligence is an autonomous aggregate of techniques that so far have not been unified. We are looking for a mathematical, algorithmic framework which will enable us to understand and analyse these algorithms.

The aim of this workshop is NOT to make comparisons between techniques, but rather to make comparisons at a conceptual level.

The session will seek to define the metaheuristics of Swarm Intelligence algorithms. A common framework is desirable for a number of reasons, including the following:

- Better understanding of the limits of application of SI techniques.
- Hope to further the analysis of all algorithms by finding overarching principles.
- Suggestions for novel and hybrid algorithms may result from the clash and the synthesis of ideas.

The workshop aims at addressing such issues from an explicitly theoretical rather than a heuristic perspective. The following contributions are welcomed:

- Position papers and reports of work in progress
- Papers proposing and advancing the metaheuristics of popular SI techniques such as PSO, ACO and SDS
- Contributions from adjacent fields e.g AIS, Multi-Agent Systems

Important Dates

Paper Submission: 1st November 2008
Decision Notification: 16th January 2009
Camera-ready Submission 16th February 2009

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