

IEEE CEC 2009
Special Session on “Techniques for Online and Distributed Evolutionary Computation”

Aims and Scope:

Within the context of computing and communication the “complexity ceiling” limits the ability to introduce innovation and to cope with changing user needs and demand. In order to overcome such limitations, it is desirable for many software and hardware systems to embed adaptation and evolution capabilities in the system fabric itself. By doing so, they would be able to work and perform well under an extreme variety of operating conditions, while at the same time easing system management tasks.

Online evolution is difficult to achieve due to a variety of problems and challenges. These include the need to envisage extremely resilient evolutionary mechanisms (able to evolve without disrupting the system operations), the ability to devise new strategies (in response to external stimuli), and to operate in noisy environments. In other words, an effective on-line system needs to continuously provide evolvability to cope with an open-ended changing environment.

Extra challenges are also faced due to the interconnected and distributed nature of many systems. Such systems cope with only partial information (as single nodes/clusters may not be aware of the global system status), and in many cases with delayed information on the (estimated) fitness level of the current solution. In addition, distributed systems are often composed of heterogeneous devices, perhaps operating over different timescales and with different constraints, further increasing the challenges of achieving evolution in the global system.

While no clear path is currently available to devise an ultimate solution to such issues, there is great potential for knowledge and tools that can be developed in the EC community to contribute to building solutions to such extremely challenging problems.

This special session will bring together scientists coming from EC and other fields in computing (e.g., chemical computing and other bio-inspired paradigms) as well as from “applied” research fields (networking, services). The intention is to provide a forum for cross-fertilization, where both problems arising in current computing and communication systems, potential solutions and theoretical EC-based approaches can be presented and discussed.

Topics of interest include, but are not limited to:

- resilient online and distributed EC mechanisms
- robustness vs. evolvability in online environments
- online evolution in artificial chemistries and chemical computing
- online/distributed evolutionary optimization in uncertain environments
- decentralized online evolutionary techniques
- online/distributed evolution in robotics and embryonic circuits
- online evolution in networked, distributed and pervasive systems

Paper submission and review process:

Papers submitted for this session will be peer-reviewed with the same criteria used for other CEC papers. The paper format of the conference is available on the website: <http://www.cec2009.org>. After a final decision is made, authors will receive a notification letter accompanied with the reports of the reviewers. All accepted papers will be published along with all accepted papers at IEEE CEC 2009 and at least one of the authors must register and attend to present his/her paper at IEEE CEC 2009.

Important Dates

Paper Submission: November 1st, 2008

Notification of acceptance/rejection: January 16th, 2009

Camera-ready submission: February 16th, 2009

Organizers

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