



IEEE* e-Science 2010 Conference
7-10 DECEMBER 2010

CALL for PAPERS

PARALLEL OPTIMISATION & PARAMETER FITTING

SCOPE

This proposed special session invites papers discussing design and application of optimisation algorithms to real problems in computational science. Emphasis is placed on algorithms and methods that are particularly suited to parallel and distributed computing environments, such as Grids, Peer-to-Peer Networks, Multi-Core systems, GPGPU and Cloud Computing, due to the practical needs of many of the target problems.

In addition, we are interested in optimization problem solving by evolutionary approaches or hybrid evolutionary approaches. We encourage submissions describing practical implementations, including all aspects from user interface design and details of optimisation methods to system architecture and access to resources. We are interested in application papers discussing the power and usefulness of these methods for optimisation and parameter fitting of real-world problems in areas such as the following:

- Arts, Humanities and e-Social Science
- Bioinformatics and Health
- Physical Sciences and Engineering
- Climate & Earth Sciences

You are invited to submit a paper with unpublished, original work of not more than 6 pages of double column text using single spaced 10 point size on 8.5 x 11 inch pages, as per IEEE 8.5 x 11 manuscript guidelines. Templates are available here:

<http://www.ieee.org/web/publications/pubservices/confpub/AuthorTools/conferenceTemplates.html>.

The topics are, but not limited to:

- Application of optimisation or parameter fitting to real-world problems
- Reliability and robustness in optimisation
- Parallel algorithms and meta-heuristics
- Optimisation algorithms on novel parallel architectures
- Practical aspects of parallel approaches
- Research tools, workflow and systems
- Performance measures
- Adaptation, learning, and anticipation
- Hybrid approaches
- Scheduling and its optimisation
- Interactive optimisation
- Preference-based optimisation
- Decision making

KEYNOTE PRESENTATION

Parameter Optimisation in the Nimrod/OK toolkit
Prof. David Abramson, Monash University, Australia

This talk discusses the Nimrod/OK tool and how it can be used to perform automatic parameter optimisation. Nimrod/OK builds on the Kepler scientific workflow engine and the Nimrod/O optimisation tools. A user can define an arbitrary scientific workflow that computes an objective function, and then combine this with predefined optimisation components. Current components support a range of different optimisation methods, including gradient descent, simplex and meta-heuristics such as genetic algorithms. Loops in the workflow make it possible to iterate automatically until a good solution is obtained. In order to achieve good performance, Nimrod/OK supports parallelism within the optimisation methods, as well as running multiple independent searches concurrently. It is possible to use local compute clusters as well as distributed Grid and Cloud resources. We illustrate the tool with a number of real case studies in bio-engineering and electro-chemistry.

ORGANIZING COMMITTEE

Sanaz Mostaghim (Karlsruhe Institute of Technology, Germany)

Andrew Lewis (Griffith University, Australia)

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IMPORTANT DATES

Papers due: 13 September, 2010

Notification of acceptance: 27 September, 2010

Final paper submission: 13 October, 2010

CONTACT

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