Special Session on
Reconfigurable Computing System

This session is organized as a part of

The First International Conference on Advanced Machine Learning Technologies and Applications AMLTA 2012, Cairo, Egypt 8-10th December, 2012.

Conference web page: [http://www.egyptscience.net/AMLTA12/](http://www.egyptscience.net/AMLTA12/)

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Introduction

Reconfigurable computing has emerged a cutting edge leading technology for the vertical application domain where it is necessary to satisfy simultaneously the dual demands of high performance as well as a high degree of flexibility in operation. A plethora of strategies and techniques geared towards dynamically adapting the architecture, the operating system processes and other hardware-software artefacts to synergize the computations and communication involved in sophisticated applications has demonstrated significant performance and power-consumption benefits compared to general purpose architectures. There are however, interesting challenges posed by reconfigurable platforms including effective run-time placement and scheduling of tasks on multiple FPGAs, tackling online fragmentation, ensuring optimum reuse of tasks, minimizing power consumption at every level and forging an optimum combination of fault tolerance techniques to mitigate the impact of failure. The goals of reconfigurable computing should not be restricted within the confines of hardware reconfiguration alone; researchers must envisage other adjacent reciprocals such as system optimization, seamless reconfiguration of OS parameters and graceful system recovery. Design Space Exploration (DSE) aims at scanning various models representing different design candidates to support activities like complex and on-the-fly reconfiguration of critical systems, automated maintenance of IT systems and remote-location based control systems that are flavoured with automation and computational intelligence.
Nature inspired heuristics such as collaborative agents provide wonderful opportunities to glean knowledge from nature’s myriad adaptation and optimization mechanisms and apply them to address these design issues. Learning from heuristics encapsulated within the behaviour of natural insect colonies like ants, bees, termites and bacteria could be the ideal agent to search through the design space encompassing plenty of design constraints. This special session invites challenging thematic and real unpublished work on reconfigurable applications and simulations, pivoted on natural heuristics driven learning phenomena, which may nourish the field of reconfigurable computing to push it towards more intelligent and adaptive systems.

Topics of interest include (but are not limited to) the following:

- **Heuristic Model driven framework for design**
- Evolutionary design strategy with learning
- Natural Colony Based Design optimization
- Guided and supervised Design Exploration through Agents
- Application specific system optimization with RC
- Operating system reconfiguration
- Nature inspired fault management on reconfigurable platforms
- Intelligent design of high availability systems on RC platforms
- Adaptive FPGA placement & scheduling by nature learning
- Code optimization for RC platforms
- Low power RC design
- Conceptual modelling of adaptive systems
- Placement and scheduling
- High performance RC systems
- Dynamic defragmentation heuristics
- Embedded Systems that learn from nature
- Simulation of Automated Design using Natural agents
- Reconfigurable Multimedia processing using natural learning

**Paper Submission and Publication**
Authors are invited to submit original research contributions not concurrently submitted elsewhere (easychair.com).

**Important Dates**

- Deadline for paper submission: June 15, 2012
- Notification of Acceptance: August 15, 2012
- Deadline for Camera-ready manuscript Submission: September 15, 2012
- Registration Deadline: September 15, 2012
- Conference dates: 8th-10th December, 2012