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http://www.smc2011.org/

Special Session Call for Papers

SMC2011 Special Session on **Evolving and Adaptive Intelligent Systems**

Special Session CfP website (www.lancs.ac.uk/staff/angelov/SMC2011_EAIS.pdf)

Special Session organizer

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Introduction/Call for Papers

The aim of the special session is to present latest results in this emerging and fast expanding area and give a forum to discuss the challenges for the future.
One of the important **research challenges** today is to develop intelligent systems with a higher level of flexibility and autonomy that can develop their understanding/awareness of the environment and ultimately their intelligence. To address the problems of modelling, control, prediction, classification and data processing in highly dynamic environments a system must be able to fully adapt its structure rather than adjust its parameters based on a pre-trained and fixed structure. That is, the intelligent system must be able to evolve, to self-develop, to self-organize. **The focus** of this special session will be on methods for evolution of individual systems rather than of a population of such systems over generations, as it is the case in the conventional evolutionary computation methods. The evolving systems use inheritance and gradual change with the aim of life-long learning and adaptation, self-organization (including system structure evolution) in order to adapt to the (unknown and unpredictable) environment. The problems of on-line structure evolution, feature selection, interpretability, cooperation etc. will be discussed.

Indicative Topics/Areas

Methodology

- New Adaptive and Evolving Learning Methods
- Stability, Robustness, Unlearning Effects
- Structure Flexibility and Robustness in Evolving Systems
- Evolving in Dynamic Environments
- Drift and Shift in Data Streams
- Self-monitoring Evolving Systems
- Evolving Decision Systems
- Evolving Perceptions
- Self-organising Systems
- Neural Networks with Evolving Structure
- Non-stationary Time Series Prediction with Evolving Systems
- Automatic Novelty Detection in Evolving Systems
- On-Line Identification of Fuzzy Systems
- Evolving Neuro-fuzzy Systems

- Evolving Clustering Methods
- Evolving Fuzzy Rule-based Classifiers
- Evolving Regression-based Classifiers
- Evolving Intelligent Systems for Time Series Prediction
- Evolving Intelligent System State Monitoring and Prognostics Methods
- Evolving Intelligent Controllers
- Evolving Fuzzy Decision Support Systems
- Evolving Probabilistic Models

Real-life applications

- Robotics
- Defence
- Intelligent Transport
- Bio-Informatics
- Industrial Applications
- Data Mining and Knowledge Discovery
- Control Systems
- Evolving Consumer Behaviour
- Evolving Activities Recognition
- Evolving Self-localisation Systems

Important Dates

April 1, 2011: Deadline for submission of full-length papers to special sessions.

June 1, 2011: Acceptance/Rejection Notification.

July 5, 2011: Final camera-ready papers due in electronic form.

Submission

Please contact the Special Session organizer for arrangement of submission in the first instance. All submissions may well need to be uploaded to SMC11 main conference online submission system.

All submitted papers of Special Sessions have to undergo the same review process (three completed reviews per paper). The technical reviewers for each Special Session paper will be members of the SMC 2011 Program Committee and qualified peer-reviewers to be nominated by the Special Session organizers.

Selected authors will be invited to submit extended papers for a **special issue of the Springer journal** Evolving Systems

Organized by IEEE SMC TC on **Evolving Intelligent Systems**