

Special Session Call for Papers

Special Session

on

Learning in evolving environments and its application on real-world problems

<http://www.icmla-conference.org/icmla11/>

AIMS AND SCOPE

The computerization of many life activities and the advances in data collection and storage technology lead to obtain mountains of data. They are collected to capture information about a phenomena or a process behavior. These data are rarely of direct benefit. Thus, a set of techniques and tools are used to extract useful information for decision support, prediction, exploration and understanding of phenomena governing the data sources.

Learning methods use historic data points about a process past behavior to build a predictor (classifier, regression model). The latter is used as an old experience to predict the process future behavior. However, the predictor needs to adjust itself (self-correction or adaptation) as new events happen or new conditions/system states occur (e.g. during on-line operations). The goal is to ensure an accurate prediction of process behavior according to the changes in new incoming data characteristics. This requires a continuous learning over long period of time with the ability to evolve new structural components on demand and to forget data becoming obsolete and useless. Incremental and sequential learning are essential concepts in order to avoid time-intensive re-training phases and account for the systems dynamics/changing data characteristics with low computational effort and virtual memory usage (enhancing on-line performance). This is because data is processed in sample-wise and single-pass manner.

It is important that updates of model parameters and structure is achieved without a “catastrophic forgetting”. Therefore, a balance between continuous learning and “forgetting” is necessary to deal with non-stationary environments.

This special session looks to gather and discuss efficient techniques, methods and tools able to manage, to exploit and to interpret correctly the increasing amount of data in environments that are continuously changing. The goal is to build models for predicting the future system behavior, able to tackle and to govern the high variability of complex non-stationary systems.

TOPICS

This session would solicit original research papers including but not limited to the following:

- Incremental learning methods,
- Adaptive, life-long and sequential learning,
- On-line classification and regression methods,
- Evolving structural components and systems modelling
- Incremental, evolving un-supervised methods
- Incremental/on-line Dimension reduction methods
- Concepts to address drifts and shifts in data streams (weighting, gradual forgetting etc.)
- On-line/Incremental Active and Semi-supervised learning concepts
- On-line Human-machine interaction and the incorporation of background knowledge
- Adaptive data pre-processing and knowledge discovery
- Applications in the field of dynamic, on-line, incremental learning such as

- Monitoring,

- On-line quality control systems
- Fault detection, isolation and prognosis,
- Very huge data bases
- Web applications
- Decision Support Systems
- And many more

IMPORTANT DATES

Paper Submission Deadline:	July 15, 2011
Notification of acceptance:	September 2, 2011
Camera-ready papers & Pre-registration:	October 1, 2011
The ICMLA Conference:	December 18-21, 2011

This special session will be held as part of the ICMLA'11 conference. Authors should submit papers through the main conference submission website. Papers must correspond to the requirements detailed in the instructions to authors. All conference submissions will be handled electronically. Detailed instructions for submitting the papers are provided on the conference home page at:

<http://www.icmla-conference.org/icmla11/>

Accepted papers should be presented by one of the authors to be published in the conference proceeding. If you have any questions, do not hesitate to direct your questions to the session organizers.

SPECIAL SESSION ORGANIZERS:

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