Special Session Call for Papers

Special Session on
Adaptive and on-line learning in
non-stationary environments
in
The Twelfth International Conference on Machine Learning and Applications
ICMLA2013
Miami, Florida, U.S.A. December 4-7, 2013
http://www.icmla-conference.org/icmla13/

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. The information is mostly provided in terms of system models describing the behaviour of the actual system or application under examination.

Whenever dynamic process changes occur due to changing system states, varying operation modes, or environmental conditions, the information content extracted from older (batch off-line) data sources needs to be adjusted; otherwise, the models may deteriorate significantly in performance. In on-line settings, this circumstance requires permanent updates of model components and parameters, in off-line applications a transfer of old models to new states.

Therefore, adaptive and dynamic data-driven learning methodologies play an important role, as they are able to cope with dynamically and continuously evolving environments in order to keep the quality of the system models permanently up-to-date and on a high level. In particular, the methodologies typically employed are able to adjust the models to new system states and operation modes on-the-fly. Incremental learning concepts and evolution of model components play a key role during model adaptation in order to avoid time-intensive re-training phases. Thus, the models equipped with these technologies are also often called evolving models or in a broader sense evolving intelligent systems.

Important issues in these evolving learning mechanisms are dealing with upcoming drifts appropriately (achieving a reasonable balance between continuous learning and "forgetting"), keeping the supervision effort of operators at a low level, dealing with high-dimensional learning problems (omitting curse of dimensionality) as well as allowing a fast processing (by e.g. keeping the complexity of the models low).

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 complexity reduction, merging and splitting concepts
- On-line/Incremental Active and Semi-supervised learning concepts
- On-line Human-machine interaction and the incorporation of background knowledge
- Transfer learning
- Adaptive data pre-processing and knowledge discovery
- Applications in the field of dynamic, on-line, incremental learning such as

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

IMPORTANT DATES

Paper Submission Deadline: August 5th, 2013
Notification of acceptance: September 10th, 2013
Camera-ready papers & Pre-registration: October 10th, 2013
The ICMLA Conference: December 4th, 2013

This special session will be held as part of the ICMLA'13 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/icmla13/

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:

- Moamar Sayed-Mouchaweh (Ecole des Mines de Douai, Computer Science and Automatic Control Lab, France, Email: moamar.sayed-mouchaweh@mines-douai.fr)
- Edwin Lughofer (Johannes Kepler University Linz, Department of Knowledge-Based Mathematical Systems, Austria, edwin.lughofer@jku.at , Webpage: http://www.flll.jku.at/staff/edwin)

PRELIMINARY PROGRAM COMITTEE MEMBERS (TO BE CONFIRMED):

Rosangela Ballini, Universidade Estadual de Campinas, Brazil
Yevgeniy Bodyanskiy, Kharkiv National University of Radio Electronics, Ukraine
Abdelhamid Bouchachia, Bournemouth University, UK
Arnaud Doniec, Ecole des Mines de Douai, France
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Christoph Hametner, Vienna University of technology, Austria
Jens Hülsmann, University of Osnabrück, Germany

Ismael Lopez, CINVESTAV, Mexico
Mahardhika Pratama, Nanyang Technological University, Singapore
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Bogdan Trawinski, Wroclaw University of Technology, Poland
Jose Villar, University of Oviedo, Spain

SHORT BIOGRAPHY OF THE ORGANIZERS/CHAIRS

Moamar Sayed-Mouchaweh received his Master degree from the University of Technology of Compiegne-France in 1999. Then, he received his PhD degree from the University of Reims-France in December 2002. He was nominated as Associated Professor in Computer Science, Control and Signal processing at the University of Reims-France in the Research center in Sciences and Technology of the Information and the Communication (CReSTIC). In December 2008, he obtained the Habilitation to Direct Researches (HDR) in Computer science, Control and Signal processing. Since September 2011, he is working as a Full Professor in the School of Mines of Douai-France (Ecole des Mines de Douai EMD) at the Department of Automatic Control and Computer Science (Informatique & Automatique IA).

Edwin Lughofer received his Ph.D. degree from the Department of Knowledge- Based Mathematical Systems, University of Linz, where he is now employed as post-doctoral fellow. During the past 10 years, he has participated in several international research projects as key researcher of the University of Linz, such as the EU-projects AMPA, DynaVis (www.dynavis.org), and Syntex (www.syntex.or.at). In this period, he has published around 60 journal and conference papers in the fields of EFS, machine learning and vision, clustering, fault detection, image processing, and human–machine interaction, including a monograph on "Evolving Fuzzy Systems" (Springer, Heidelberg 2011).