Special Issue on

„Adaptive and on-line learning in non-stationary environments”

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Background
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 behaviour. 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 behaviour to build a predictor (classifier, regression model). The latter is used as an old experience to predict the process future behaviour. 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 behaviour according to the changes in new incoming data characteristics. This requires a continuous learning over a long period of time with the ability to evolve new structural components on demand and to forget data becoming obsolete and useless (e.g., in order to react on drifts appropriately). 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.

Objectives
The aim of this special issue is to clarify new developments in the field of learning in non-stationary environments and its applications to solve on-line real-world modeling, especially with an intensified dynamic data streaming context, changing environmental conditions and system states or as part of large-scale problems, e.g. web mining, multi-sensor networks, sequential video analysis or predictive maintenance in factories for the future.
The special issue is dedicated to (solely) enfranchise selected papers from the special session *Adaptive and on-line learning in non-stationary environments* (held at ICMLA 2013) in an enriched and expanded form. Thus, selected authors, which have been presented their papers at this session, will be invited (within an email letter) to provide an extended version of their opuses for this special issue.

Selected papers should be formatted according to the instruction guidelines for authors found at [http://www.springer.com/physics/complexity/journal/12530](http://www.springer.com/physics/complexity/journal/12530) and submitted through the regular submission gate at @ Evolving Systems journal (Springer) located [https://www.editorialmanager.com/evos/](https://www.editorialmanager.com/evos/) by choosing *S.I.: Adaptive and on-line learning in non-stationary environments* as article type.

**Important Dates**

- **Paper submission deadline:** April 30, 2014
- **Notification of acceptance/rejection:** July 15, 2014
- **Submission of revised version:** September 15, 2014
- **Final papers submission:** December 21, 2014
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