Call for Papers:

Recent Advances and New Challenges in Evolving Fuzzy Systems

Special Session to be held at

FUZZ-IEEE/WCCI 2016, Vancouver, Canada
http://www.wcci2016.org/

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Aim

Evolving systems are modular systems that simultaneously develop their structure, functionality, and parameters in a continuous, self-organized, one pass adaptive way from data streams.

During the last 12-15 years, the concept of **Evolving Fuzzy Systems (EFS)** established as a useful and necessary methodology to address the problems of imprecision, incremental learning, adaptation and evolution of fuzzy Systems in dynamic environments and during on-line/real-time operation modes. EFS are able to automatically and autonomously adapt themselves to new operating conditions and system states and hence guarantee a high process safety, especially in case of highly dynamic and time-variant systems. This is especially necessary when precise and sufficient training data is not available (e.g., because of high costs for data collection or annotation) in order to set up models which cover the whole range of possible system states. Another major topic which can be addressed with EFS are the building of models from huge massive stream data or even from Big Data, and to serve as dynamically adaptable knowledge base within enriched human-machine interaction applications (learning and teaching).

The goal of the special session is to provide a broad picture of the recent developments and to explore further (open) research challenges in one or several specific research topics mentioned below.

Scope

- *Novel adaptive, incremental methods in evolving fuzzy modeling tasks:*
  - Evolving fuzzy classifiers
  - Evolving Takagi-Sugeno-Kang type fuzzy systems
  - Evolving neuro-fuzzy approaches
  - Evolving type-2 fuzzy systems and related architectures
  - Evolving modeling and control systems
  - Data stream fuzzy clustering
  - Adaptive fuzzy pattern recognition
  - Adaptive fuzzy regression and correlation techniques

- *Enhanced Issues in dynamic fuzzy methods*
  - Issues on robustness, stability and process-safety in evolving fuzzy systems
  - Evolving techniques to address concept drift and shift
  - Evolving fuzzy models in soft sensing
  - On-line techniques to deal with model uncertainty and interpretability issues
  - Active and semi-supervised learning with fuzzy concepts
  - On-line dimensionality reduction and feature selection
  - Evolving granular modeling and control
  - Towards plug-and-play capability

- *Real-World applications of evolving fuzzy systems in*
  - On-line system identification
  - On-line fault detection and decision support diagnosis
  - Data stream mining and adaptive knowledge discovery
  - Database and web mining
  - Control and decision support systems
  - Image classification and visual Inspection
  - Automation and robotics
  - Control systems
  - Data stream mining and adaptive knowledge discovery
  - Forecasting in financial domains and time-series prediction

Information about the organizers

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