



Call for Papers:

Special Session on

"Fuzzy Machine Learning and On-line Modeling"

to be organized at the [IPMU Conference 2012](#)

Catania, Italy, 09.07.2012-13.07.2012

by the [EUSFLAT working group on Machine Learning and Data Mining \(DAMI\)](#)

Organizers:

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Important Dates

- **December 10, 2011:** Paper submission (through conference website)
- February 25, 2012: Notification of acceptance
- March 31, 2012: Full paper submission

Aim of the Session

The aim of this special session to be held as **part of the [IPMU 2012 conference](#) in Catania, Sicilia** is to provide an opportunity for researchers and practitioners to discuss the novelties pertaining to various issues in the field of fuzzy machine learning, to exchange ideas, concepts and approaches, and to identify promising future research directions in this field. The special session is dedicated to **new methods, algorithms and challenges in the field of extracting models, patterns and knowledge from data using** 1.) **fuzzy methodologies** (fuzzy logic, fuzzy sets, fuzzy systems etc.) and 2.) **uncertainty analysis techniques** which are connected with **machine learning and data-driven modelling approaches.**

A special emphasis will be placed on **on-line learning methods**, where **incremental learning** of parameters, **evolving structures** and **adaptive knowledge extraction** from streaming data play a central role to account for permanently changing system dynamics and emergence of new states of the system, operating conditions and environmental influences. Moreover, the application of these methods is appealing when dealing with huge data bases which cannot be processed at once due to memory space constraints.

Scope

The session embraces three main streams of topics of interest:

- Fuzzy Machine Learning and Data Mining (in batch mode)
- On-line Fuzzy and Uncertainty Modelling (in incremental mode)
- Real-World Applications (of the two methodologies)

Sub-topics in these fields are as follows:

- **Fuzzy Machine Learning and Data Mining (in batch mode)**
 - Data preprocessing
 - Feature extraction and selection
 - Handling of incomplete and heterogeneous data
 - Learning predictive models
 - Ordered, hierarchical and multi-label classification
 - Preference learning and ranking
 - Kernel-based methods
 - Ensemble methods
 - Multi-objective and multi-instance learning
 - Data, text, and web mining methods
 - Mining at multiple levels of abstraction,
 - Database querying and ad-hoc data mining,
 - Visualization and presentation of data mining results.
- **On-line Fuzzy and Uncertainty Modelling (in incremental mode)**
 - Evolving fuzzy systems and classifiers
 - Evolving/Adaptive neuro- and type 2 fuzzy systems
 - Incremental fuzzy clustering
 - Adaptive fuzzy pattern recognition approaches
 - On-line fuzzy regression techniques
 - Fuzzy techniques for addressing concept drift
 - On-line active and semi-supervised learning
 - Dynamic data-mining using fuzzy models
 - On-line feature selection and weighting
 - Reliability aspects
- **Real World Applications**
 - System Identification
 - On-line fault detection and quality control
 - Decision support systems
 - Time series analysis
 - Adaptive chemometric models
 - Learning in dynamic systems