

Call for Papers
IEEE Computational Intelligence Magazine
Special Issue on “Model Complexity, Regularization and Sparsity”
<http://home.deib.polimi.it/boracchi/events/ModelComplexity.html>

Aims and Scope

The effective management of solution complexity is one of the most important issues in addressing Computational Intelligence problems. Regularization techniques control model complexity by taking advantage of some prior information regarding the problem at hand, represented as penalty expressions that impose these properties on the solution. Over the past few years, one of the most prominent and successful types of regularization has been based on the *sparsity* prior, which promotes solutions that can be expressed as a linear combination of a few atoms belonging to a *dictionary*. Sparsity can in some sense be considered a “measure of simplicity” and, as such, is compatible with many nature-inspired principles of Computational Intelligence. Nowadays, sparsity has become one of the leading approaches for learning adaptive representations for both descriptive and discriminative tasks, and has been shown to be particularly effective when dealing with structured, complex and high-dimensional data.

Regularization, including sparsity and other priors to control the model complexity, is often the key ingredient in the successful solution of difficult problems; it is therefore not surprising that these aspects have also recently gained a lot of attention in big-data processing, due to unprecedented challenges associated with the need to handle massive datastreams that are possibly high-dimensional and organized in complex structures.

This special issue aims at presenting the most relevant regularization techniques and approaches to control model complexity in Computational Intelligence. Submissions of papers presenting regularization methods for Neural Networks, Evolutionary Computation or Fuzzy Systems, are welcome. Submissions of papers presenting advanced regularization techniques in specific, but relevant, application fields such as data/datastream-mining, classification, big-data analytics, image/signal analysis, natural-language processing, are also encouraged.

Topics of Interest

- Regularization methods for big and high-dimensional data;
- Regularization methods for supervised and unsupervised learning;
- Regularization methods for ill-posed problems in Computational Intelligence;
- Techniques to control model complexity;
- Sparse representations in Computational Intelligence;
- Managing model complexity in data analytics;
- Effective priors for solving Computational Intelligence problems;
- Multiple prior integration;
- Regularization in kernel methods and support vector machines.

Important Dates

- 22nd January, 2016: Submission of Manuscripts
- 30th March, 2016: Notification of Review Results
- 30th April, 2016: Submission of Revised Manuscripts
- 15th June, 2016: Submission of Final Manuscripts
- November, 2016: Special Issue Publication

Submission Process

The maximum length for the manuscript is typically 20 pages in single column with double-spacing, including figures and references. Authors of papers should specify in the first page of their manuscripts the corresponding author's contact and up to 5 keywords. Additional information about submission guidelines and information for authors is provided at the [IEEE CIM website](http://www.ieee-cim.org).

Submission should be made via at <https://easychair.org/conferences/?conf=ieeecim1116>

Guest Editors

Prof. Cesare Alippi,

Dipartimento di Elettronica, Informazione e Biongegneria, Politecnico di Milano,
via Ponzio 34/5, Milano, 20133, Italy
email: cesare.alippi@polimi.it

Dr. Giacomo Boracchi,

Dipartimento di Elettronica, Informazione e Biongegneria, Politecnico di Milano,
via Ponzio 34/5, Milano, 20133, Italy
email: giacomo.boracchi@polimi.it

Dr. Brendt Wohlberg,

Theoretical Division, Los Alamos National Laboratory,
Los Alamos NM 87545, USA
email: brendt@lanl.gov