



Special issue on “Intelligent and fuzzy systems in data science and big data”

Stefania Tomasiello¹ · Feng Feng² · Sotiris Kotsiantis³ · Alireza Khastan⁴

Published online: 14 May 2020
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

In the era of big data, intelligent as well fuzzy tools have become more important than ever. Extracting “intelligence” from a huge amount of data has allowed to support decisions in many fields, ranging from medicine to engineering. On the other hand, looking at such a context from a fuzzy perspective allowed in a certain sense to start ways of reasoning, such as the interpretability of computing schemes, which have been becoming more and more complex. Yet, successful applications of bio-mathematical modelling in a fuzzy environment showed a good alternative to mere black-box tools.

This special issue is devoted to the current research in the above-mentioned areas, with recent advances and challenges in the theory and applications of broadly perceived intelligent systems.

It comprises thirteen papers, which are mostly extended versions of selected papers presented at the conference 5th International Conference on Fuzzy Systems and Data Mining (FSDM2019), held in Kitakyushu City, Japan, October 18–21, 2019.

✉ Stefania Tomasiello
stefania.tomasiello@ut.ee

Feng Feng
fengf@xupt.edu.cn

Sotiris Kotsiantis
sotos@math.upatras.gr

Alireza Khastan
khastan@iasbs.ac.ir

¹ Institute of Computer Science, University of Tartu, Tartu, Estonia

² Department of Applied Mathematics, and the Shaanxi Key Laboratory of Network Data Analysis and Intelligent Processing, Xi'an University of Posts and Telecommunications, Xi'an, China

³ Department of Mathematics and Informatics, University of Patras, Patras, Greece

⁴ Department of Mathematics, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran

The contributions focus primarily on issues including:

- a fuzzy-Markov forecasting model for stock fluctuation time series;
- similarity relations with application to Fuzzy Risk Analysis;
- multiple fuzzy parametric sets in clustering;
- hybrid fuzzy rule-based classification systems for heart disease diagnosis;
- mining high influence co-location patterns from instances with attributes;
- hole detection in heterogeneous networks;
- mining traffic congestion propagation patterns;
- a sparse auto-encoder network for the estimation of spreading sequences in long-code direct-sequence code division multiple access (CDMA) signals;
- a deterministic approach to a special case of the minimum constraint removal problem in the context of big data;
- multi-label feature selection based on information fusion in multi-source data;
- an approach to enhance the probabilistic matrix factorization for collaborative filtering in recommendation systems for large sparse datasets;
- experimental analysis of the typical machine learning methods for Botnet DDoS;
- a genetically-optimized Support Vector Regression algorithm for the prediction of corn drying performance.

Acknowledgements We would like to thank all authors for their contributions and reviewers for their timely and constructive comments. We thank Prof. Vincenzo Loia, the Editor in Chief of this journal, for the opportunity to edit this issue and, last but not least, the FSDM conference secretary. Dr. Tomasiello acknowledges support from the European Social Fund via IT Academy programme.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.