

*Guest Editorial*

**Special Issue on Software Tools for Soft Computing**

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The term Soft Computing refers to a family of techniques (Fuzzy Logic, Neuro-computing, Probabilistic Reasoning, Evolutionary Computation, etc.) endowed with the ability to work in a cooperative way, taking profit from the main advantages of each other, thus tackling with complex real-world problems really hard to solve otherwise<sup>7</sup>.

In the last years, many software tools have been developed for Soft Computing. This special issue is focused on software for Soft Computing with special attention to fuzzy systems software<sup>8</sup> and open source software<sup>12</sup>. Open tools have already reached a high level of development being ready to play an important role for industry and academia research.

This special issue is made up of 5 papers devoted to recent and outstanding developments in the field of software for Soft Computing. The issue originated from presentations selected in the special session “Software for Soft Computing” at “2012 IEEE International Conference on Fuzzy Systems (Fuzz-IEEE 2012)” held in Brisbane (Australia), June 10-15th, 2012, together with invited papers from well recognized researchers in the topic. Six papers were submitted to the special issue, every paper was revised by at least two referees and finally five of them

were accepted according to the referees’ evaluations.

The first paper, “NIP - An Imperfection Processor to Data Mining Datasets” is devoted to techniques that can work with low quality data<sup>9,11</sup>. Cadenas et al. present a software tool developed in Java, called NIP, which allows improving the creation and management of low quality datasets. This tool lets us transform a dataset by adding low quality data, constructing a fuzzy partition of the attributes, etc. The authors think this tool can be used as a common framework to create low quality datasets and so, for testing and comparison of data mining techniques and algorithms.

The second paper, “Soft Computing-Based Decision Support Tools for Spatial Data” is devoted to the integration of georeferenced and temporal data into decision making support systems<sup>10,13</sup>. Guillaume et al. present an open source framework designed for modeling and decision making from expert knowledge and georeferenced data. This framework is based on specialized open source toolboxes and software, and its design is inspired by the fuzzy software capabilities developed in FisPro<sup>6</sup> for ordinary non-georeferenced data.

The third paper, “Fuzzy Logic in KNIME - Mod-

ules for Approximate Reasoning” is focus on the well-known software tool KNIME<sup>3</sup>. Berthold et al. describe the integration of fuzzy concepts and classic fuzzy learning algorithms in KNIME.

The fourth paper, “Quest for Interpretability-Accuracy Trade-off Supported by Fingrams into the Fuzzy Modeling Tool GUAJE” is devoted to the use of fuzzy inference-grams (fingrams) for understanding the structure and behavior of fuzzy systems in terms of rule co-firing<sup>2</sup>. Pancho et al. present a new module for fingram generation and analysis included in the free software tool GUAJE<sup>1</sup>. This new module is a powerful tool for understanding the fuzzy system behavior at inference level.

The fifth paper, “jFuzzyLogic: A Java Library to Design Fuzzy Logic Controllers According to the Standard for Fuzzy Control Programming” is devoted to fuzzy logic control<sup>4,5</sup>. Cingolani et al. present an open source Java library called jFuzzy-Logic which offers a fully functional and complete implementation of a fuzzy inference system according to the standard IEC 61131, providing a programming interface and Eclipse plug-in to easily write and test code for fuzzy control applications.

Finally, as Guest Editors of this special issue, we would like to thank all the authors for their contributions and the referees for their kind and valuable cooperation and constructive feedback.

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