EDITORIAL

It is an honor and a pleasure for me to present the Special Issue of Mathware devoted to the X Spanish Congress on Fuzzy Technology and Logic (ESTYLF), which was held in Sevilla in September 2000.

Fuzzy logic and technology continue being an emerging and evolving field aimed at the computational management of imprecision, uncertainty and partial knowledge to model human thinking and ambiguity in real-life situations. It comprises fuzzy logic theory, technological developments and applications in many fields such as decision-making, information systems, process control, robotics, pattern recognition and many others.

In this Special Issue, there are nine papers selected by the Program Committee of the Conference. According to the scope of the Congress, the Special Issue has been divided in two Sections. The first one is devoted to foundations while the second includes application papers.

The first paper, from del Amo, Gomez and Montero, deals with relevance and redundancy in fuzzy classification systems. A fuzzy classification system is defined as an aggregative model, in such a way that the Ruspini classical definition of fuzzy partition appears as a particular case. The relevance and redundancy are analyzed in order to allow the possibility of learning from previous experiences.

The second paper, from Moreno, Moreno Vega and Verdegay, is devoted to location problems in fuzzy graphs. The linguistic vagueness in the location of a facility is modeled by using networks with fuzzy values. The paper deals with the general formulation of the Fuzzy Location Problem, showing the variety of problems that can be considered and proposing solutions for some of these problems.

The third paper, from Martin, Mayor and Suñer, deals with dispersion measures. A new framework for the study of measures of dispersion for a class of n-dimensional lists is proposed. In this paper the concept of monotonicity with respect to a "sharpened"- type order is introduced, leading to create a reasonable and general ambit where the notion of dispersion measure can be studied.

The fourth paper, from Moreno Velo and co-workers, presents a specification language for fuzzy systems. The main advantage of this system when comparing with its predecessor is the ability to use user defined membership functions, parametric operators and linguistic modifiers. The paper also presents several development tools based on this language.

The last paper in the first part, from Diaz-Hermida and co-workers, deals with the probabilistic evaluation of fuzzy quantified sentences. This paper describes a classification for fuzzy quantifiers. The quantifiers can be evaluated by following a fuzzy model with probabilistic interpretation based on the Theory of Generalized Quantifiers.

The second part contains four papers which represent different application areas. The first paper, from Aranda and co-workers, is a significant example on the application of information systems based on fuzzy logic to a relevant problem in the management of agricultural and environmental resources in South Spain. It presents a system that can be employed by different users to obtain information about oil-tree crops and their environmental support in the Granada province. The

system is based on fuzzy databases and is able to manage uncertain and imprecise data, to represent spatial distribution and local data, and to fuse data from different sources.

The second paper, from M. Pinzolas and co-workers, is in the area of pattern recognition, where many neuro-fuzzy applications have been presented in the last years. In this paper a neuro-fuzzy system for isolated hand-written digit recognition using a similarity fuzzy measure is presented. The system first normalizes the input and compares it with a set of fuzzy patterns, and then a multilayer perceptron performs a neural classification.

Microelectronics development is a key technological issue on the development of new efficient fuzzy control systems. The paper from I. Baturone and S. Sanchez Solano presents an overview on the design of universal fuzzy controllers. It discusses the two basic approaches that can be used to design programmable universal controller integrated circuits. Analog, mixed-signal and digital realizations are summarized and compared.

The last paper of the second part is devoted to the application of the ant colony system algorithm in the design of cooperative rules fuzzy systems. It has been shown by many authors that cooperative rules methodology obtains accurate models preserving the highest interpretability of the linguistic fuzzy rule-based systems. Thanks to the capability of the ant colony system algorithm to include heuristic information, in this paper by R. Alcalá and co-workers, the learning process is accelerated without model accuracy losses.

To conclude, the above nine papers show that fuzzy logic have gained significant maturity in Spain. New promising applications are arising contributing to maintain the important role of fuzzy technologies in the field of intelligent systems.

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