

INTELLIGENT SYSTEMS AND SOFT COMPUTING

Decision Technologies for Management Track

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The *Intelligent systems and soft computing* mini-track is part of the movement towards developing effective intelligent systems for problem solving and decision making, and towards building and implementing systems that can deal with complex and ill-structured situations, i.e. contexts for which discovery and learning can positively impact the outcome of the problem solving process.

The next generation of modeling tools and support systems will include (but is not limited to) the use of intelligent technologies (machine intelligence, neural nets, genetic algorithms), soft computing (fuzzy logic, approximate reasoning, probabilistic modeling) and advanced mathematical modeling. The use of soft computing methods is gaining in both acceptability and importance as the importance of the conflict between *rigueur* and *relevance* is becoming more apparent in a dynamic and quickly changing world. The use of advanced methods gives us more rigorous problem solving and more precise results, which become harder and harder to implement, i.e. they lose in relevance. Soft computing offers a way to keep a rigorous theoretical framework and at the same time to allow for an imprecision, which keeps the results relevant.

There is an increasing demand for smart systems for interactive planning, problem solving and decision making, by individuals or by groups of users.

The future systems will be more robust, more adaptive and easier to use than standard analytical tools. The optimization models (most of the time multiple criteria models) will be more easily incorporated in support systems. The expected end result will give the users knowledge-based support, which is adapted to the problems they need to solve and the decision making expected of them and, furthermore, to the internal logic of the context in which they will have to carry out their activities.

There is a growing interest in soft computing tools, which are used to handle imprecision and uncertainty, and to build flexibility and context adaptability into intelligent systems. The application of soft computing to decision problems is focused on a decision context, where fast and correct decision making is becoming instrumental. There is no great consensus on what exactly will form the "new decision context", but some of the key elements will

most probably be, (i) virtual teamwork in different places and in different time zones, (ii) decision support systems on mobile devices, with (iii) access to and the use of multi-layer networks (Internet(s), intranets), through which (iv) access to and the use of a multitude of data sources (databases, data warehouses, text files, multimedia sources, etc.), and with support from (v) intelligent technologies for filtering, sifting and summarizing (software agents, machine intelligence, evolutionary computing, neural nets, etc.) and (vi) multiple criteria (crisp, soft) algorithms for problem solving.

In the minitrack on *Intelligent Systems and Soft Computing* we aim to explore the issues raised by the introduction of new technology to handle decision problems. The papers accepted for the minitrack include:

Emergence of Context-Based Intelligent Assistant Systems Explained from the Analysis of Two Projects by Patrick Brézillon

Multi-Agent Systems and Microeconomic Theory: A Negotiation Approach to Solve Scheduling Problems in High Dynamic Environments by Hans Czap and Marc Becker

Toward Decision-Theoretic Planning in Multi-Agent Settings: Basic Framework by Piotr J. Gmytrasiewicz
Financial Model-Base Construction for Flexible Model Manipulation of Models and Solvers by Keun-Woo Lee and Soon-Young Huh

A Two-Level Approach to Making Class Predictions Concerning Countries'/Companies' Economic/Financial Performance by Adrian Costea and Tomas Eklund
Strategic Investment Planning by Using Dynamic Decision Trees by Peter Majlender

A Framework for Case-Based Fuzzy Multicriteria Decision Support for Tropical Cyclone Forecasting by Jocelyn San Pedro and Frada Burstein

From Computer Networks to Agent Networks by Guoqiang Zhong, Ken'ichi Takahashi, Satoshi Amamiya, Daisuke Matsuno, Tsunenori Mine and Makoto Amamiya

Two-Dimensional Packing for Irregular Shaped Objects by Ping Chen, Zhaohui Fu and Andrew Lim