

# INTELLIGENT SYSTEMS AND SOFT COMPUTING

## *Decision Technologies for Management Track*

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*Intelligent systems and soft computing* are part of the movement towards developing effective intelligent systems for problem solving and decision making, and 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 as we get more and more advanced tools on the knowledge-based systems platforms. 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 allow for an imprecision, which keeps the results relevant.

There is an increasing demand for smart systems (standard software tools enhanced with intelligent modules) for interactive planning, problem solving and decision making, by individuals or by groups of users.

The resulting systems will be more robust, more adaptive and easier to use than conventional tools. The optimization models (most of the time multiple criteria models) will be more easily incorporated in support systems. The expected end result is a generation of support systems which give the users knowledge-based support which is adapted both 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 the “new economy” decision context, where fast and correct decision making is becoming instrumental as the context is becoming

more and more complex, and will change more and more rapidly. There is no great consensus on what exactly will form the “new economy” 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:

*“Are You Thinking What I Am Thinking?” – A Comparison Of Decision Makers’ Cognitive Maps by Means Of a New Similarity Measure*, Hyeokki Kwon, Il Im and Bartel Van De Walle

*Decision Station: A Vision For a Situated DSS*, Rustam Vahidov

*Real Time Decision Support System For Portfolio Management*, Chiu-Che Tseng and Piotr J. Gmytrasiewicz

*Automating the Evolution of Agent Communication Languages Using Negotiation*, Piotr J. Gmytrasiewicz, Matthew Summers and Dhruva Gopal

*Automated Decision Technology for Network Design in Cellular Communication Systems*, Stuart Allen, Steve Hurley and Roger M. Whitaker

*Knowledge- Based IS Implementation Support: An Application to the IS Change Agent Role Problem*, Meral Binbasioglu and Elaine Winston

*Intelligent Systems for Selecting Investor-oriented Assets in Portfolio Decision-making: UNIK-PRP*, Chulsoo Kim and Chaehwan Won

*Fuzzy Rules for the Transcoding of HTML Files*, Wolfgang Muller, Andreas Dangberg and Robbie Schäfer  
*Intelligent Student Profiling with Fuzzy Models*, Dongming Xu, Huaqing Wang and Kaile Su