Soft computing refers to a collection of computational techniques in computer science, artificial intelligence, machine learning and some engineering disciplines, which attempt to study, model, and analyze very complex phenomena: those for which more conventional methods have not yielded low cost, analytic, and complete solutions. Earlier computational approaches could model and precisely analyze only relatively simple systems. More complex systems arising remained intractable to conventional mathematical and analytical methods. That said, it should be pointed out that simplicity and complexity of systems are relative, and many conventional mathematical models have been both challenging and very productive.

Key areas of soft computing include (i) neural nets, (ii) evolutionary computing, (iii) fuzzy systems, (iv) swarm intelligence, (v) Bayesian networks and (vi) chaos theory. There are now cross sections with the field known as computational intelligence.

Fuzzy sets were introduced by Lotfi Zadeh in 1965 and Soft Computing in 1991 as means of representing and working with data that was neither precise nor complete, but vague and incomplete. Fuzzy logic provides an inference morphology, which enables the principles of approximate human reasoning capabilities to be systematically used as a basis for knowledge based systems.

The theory of fuzzy logic provides a good mathematical and methodological basis for capturing the uncertainties associated with human cognitive processes, such as identifying causal relationships, thinking and reasoning. The conventional approaches to knowledge representation lack the means for representing the meaning of vague and incompletely understood concepts.

The development of fuzzy logic was motivated - to a large extent - by the need for a conceptual framework which can address the issues of uncertainty, lexical imprecision and incompleteness. Some of the important characteristics of fuzzy logic include: (i) exact reasoning is viewed as a limiting case of approximate reasoning; (ii) knowledge is interpreted as a collection of elastic or fuzzy constraints on a collection of variables; (iii) inference is viewed as a process of propagation of elastic constraints, and (iv) any logical system has a fuzzy logic based counterpart;

There are two main characteristics of fuzzy systems that give them better performance for specific applications: (i) fuzzy systems are suitable for uncertain or approximate reasoning, and (ii) fuzzy logic allows problem solving and decision making with incomplete or uncertain information.

There are four papers that have been accepted for presentation in the mini-track:

A Fuzzy Logic Multi-Criteria Decision Framework for Selecting IT Service Providers
Amir Karami, Zhiling Guo

Prioritizing IT Solution Developments through System Dynamics and Fuzzy Logic:
A Case Study
Zuzana Kristekova, Tobias Riasanow, Michael Schermann, Helmut Krcmar

Probabilistic Modeling of State Transitions on the Self-Organizing Map: Some Temporal Financial Applications
Peter Sarlin, Zhiyuan Yao, Tomas Eklund

Rough Clustering Using an Evolutionary Algorithm
Kevin Voges