A Proposal for a Special Session on

"Soft Computing (SC)/Computational Intelligence (CI)"

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Conventional techniques have successfully been applied for the solution of many complex real world problems in diverse areas but solving a problem using traditional approach requires understanding and development of an algorithm. The algorithmic requirement limits their usefulness in applications such as automobile autopilot, intelligent robotics, computer vision, recognition of speech, hand written graphics, machine translation, learning through experience etc. where no exact mathematical relationships between input-output variables are available. Therefore a non-algorithmic approach to deal with such situations is required. Soft computing/Computational Intelligence is an engineering discipline that provides an alternative to algorithmic programming. The terms Soft computing and Computational Intelligence are generally used interchangeably in engineering literature.

The term soft computing was first coined by Zadeh in 1990s when there was intense competition between various methodologies linked to artificial intelligence. His perception was that more could be gained by cooperation than by claims and counterclaims of superiority. The principal constituents of soft computing are fuzzy logic, neurocomputing, and probabilistic reasoning, with the latter subsuming genetic algorithms, belief networks, chaotic systems, and parts of learning theory. In many cases a problem can be solved most effectively by using fuzzy logic, neural networks, and probabilistic reasoning in combination rather than exclusively. The main paradigms of Computational Intelligence are neurocomputing, evolutionary computing, swarm intelligence, and fuzzy logic. Soft Computing, in addition to the paradigms of Computational Intelligence, also includes probabilistic methods.

The Special Session will cover the whole range of research and applications including:

- Mathematical foundations of fuzzy logic, neural networks, evolutionary computation, chaos theory, and swarm intelligence
- Design of hybrid systems – neuro-fuzzy, fuzzy-genetic, fuzzy-chaos, neural-genetic, neural-chaos, fuzzy-neural-genetic, etc.
- Soft Computing and Computational Intelligence applications (expert systems, embedded systems, data mining, multi-agent systems, internet search engines, pattern recognition, financial predictions, bioinformatics, telecommunication, manufacturing, healthcare delivery etc.)