



### Intelligent Systems

#### The Theme:

The fascinating world of intelligent systems, with artificial neural networks as its leading technology, has been tenaciously captivating interests of research communities since the pioneering work of McCulloch and Pitts in 1943. Since then, brain-like highly nonlinear, multidimensional, and parallel modeling has been successfully applied in many areas of industrial electronics. In ever-growing congruency with fuzzy logic and evolutionary computation, these techniques have been successfully applied in industrial and manufacturing systems and processes, factory automation, power systems and drive control and signal processing, instrumentation, motion control, robotics, sensors and actuators, communication, and computer networks. More recently, these intelligent techniques have been broadened by optimization and learning methodologies such as ant colonies and particle swarm optimization, support vector machines and wavelets. The applications ranging from hardware implementations (FPGA and VLSI), modeling and prediction (in energy fuel-cell and battery state of charge, wind turbines), intelligent, predictive, adaptive control and fault detection (PID optimization, robotic manipulators, servo systems, power filters, motor drives), to precise motion control and learning (competitive, self-organizing) and human-machine interaction (haptics, tactile control, teleoperation), and vision, pattern, object and character recognition, proved the efficacy of these intelligent, often called machine learning techniques. The main objective of this Special Section is to bring the latest advances and ideas of the worldwide research community into a common platform. Topics of interest of this Special Section include, but are not limited to:

- Neuro-fuzzy hardware implementations (FPGA, VLSI, SoC, SoPC, microcontrollers, embedded systems)
- Nonlinear (neuro, fuzzy) control (motor, server drives, sliding mode control)
- Fault-diagnostics and detection in industrial systems and automation (power, electrical drives, plants, robots)
- Dynamic, adaptive, robust, and predictive control in industrial electronics (converters, inverters, motors)
- Navigation, precise motion control, learning (competitive, self-organizing, reinforced, evolving, pulsed)
- Vision, recognition, detection, clustering (object/pattern/character recognition, cluster analysis)
- Ant colonies, swarm intelligence, support vector machines, data mining, and modern heuristics in industrial systems
- Intelligent systems in robotics, mechatronics, biomechatronics, kinematics, and exoskeletons
- Intelligent systems in signal processing (DSP)
- Theoretical papers – training algorithms
- Computational intelligence, fuzzy/neural/particle swarm implementations, data mining, and modern heuristics

#### Manuscript Preparation and Submission

Follow the guidelines in “Information for Authors” in the IEEE Transaction on Industrial Electronics <http://tie.ieee-ies.org/tie/>

Please submit your manuscript in electronic form through Manuscript Central web site: <http://mc.manuscriptcentral.com/tie-ieee>. On the submitting page #1 in popup menu of manuscript type, select: SS on Intelligent systems.

#### Timetable

**Deadline for manuscript submissions**

**Mar 31, 2010**

**Information about manuscript acceptance**

**Sep 30, 2010**

**Estimated publication date**

**Dec 2010**

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