

Special Issue on Field Robotics and Intelligent Systems

Field robots are intelligent machines that perform their missions in unstructured environments. Field robotics is concerned with the automation of robotic vehicles and platforms operating in unstructured environments, and it covers science and technology for land, sea, air and space platforms with real-world applications such as mining, exploration, surveillance, security, search and rescue, and construction. The research problems in field robotics are characterized by the following features: (1) high uncertainty (e.g., uncertainty in robot location and terrain surface conditions and properties), (2) incompleteness of information (e.g., partially observable terrain surface), (3) nonlinear and time-varying factors (e.g., interacting with human and moving obstacles), and (4) heterogeneity of operating environments (e.g., terrain changes from rocky terrain to sandy terrain). Although mathematical methods and models can be used to formulate the above problems to some extent, they are widely considered insufficient for field robots to make robust decisions in environments with little structure. Systems with hand-crafted expert rules may be employed to deal with problems for which models are unattainable or of insufficient fidelity. Their performances may degrade when the environmental conditions change. Intelligent system techniques are well suited for many of the problems in field robotics as they can learn and adapt to their operating environments, and thus do not sacrifice their performance.

This special issue will report the recent advancements in field robotics and intelligent systems. It will contain both invited and contributed papers and is scheduled to be published in March 2008. Contributions on the following topics are solicited:

- * Space robotic systems
- * Mobile robotic systems for surveillance, search, and rescue
- * Emergent behavior
- * Control of innovative mobility systems
- * Autonomous navigation and/or manipulation
- * Haptics for advanced teleoperation
- * Mobile sensor networks
- * Coordination and control of multi-robotic systems
- * Vehicle-terrain interaction modeling/perception
- * Learning algorithms for autonomous field robots

Submission of papers:

Prospective authors may submit their manuscripts to the guest editors given below with a statement that the submission is intended for this special issue. Only MS Word documents or PDF files via email submission will be accepted. (Please follow the regular guidelines of *IJICS*, <http://www.ijics.org>).

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Important Dates:

Final date for submission of manuscripts: October 15, 2007

Notification of acceptance/rejection: January 7, 2008

Submission of accepted papers: February 1, 2008