Important dates

Paper submission:

October 31st , 2011

First round of notification:

January 30th, 2012

Final papers:

March 30th, 2012

Call for Papers

A Special Issue of Ad Hoc Networks on "Theory, Algorithms and Applications of Wireless Networked Robotics"

SCOPE of The Special Issue

Teams of heterogeneous devices pursuing a common objective are envisioned to be a viable and effective solution for many civil, societal and military applications. A large body of research, from various perspectives, have been produced by both the ad hoc networking and the robotics research communities to achieve self-organization and coordination of groups of sensors, actuators, robots or drones toward target-oriented missions. But, the convergence of objectives and methodologies of the two disciplines is still open for further significant research efforts and challenging problems remain. The research on ad hoc networks, autonomic networks, cyber physical systems, self-organizing networks and machine-to-machine communications has involved issues, concepts and challenges that are useful for characterizing the pathway toward the formalization of the theory and the definition of algorithms for Wireless Networked Robotics (WNR).

WNR brings together the physical control of the devices along with their communication capabilities and it includes that so far have been either neglected or only partially explored by the ad hoc networking and the robotics research communities.

In WNR, the role of communication is to foster cooperation and information sharing among the devices and to permit that mission objectives and task division lead actions, communications and reasoning of the devices. Communication can be explicit when the devices exchange information with each other regarding their internal status, their roles and the target of the mission, or implicit when they ground their decisions according to the sensing and observation of the surrounding devices. In both cases, communication schemes for coordination and control of groups of

intelligent devices can draw inspiration from natural systems, where common objectives are pursued through the explicit or implicit interaction of single, resource constrained elements of a group. More specifically, swarm intelligence and swarm robotics offer several solutions for the coordination of devices based on direct/indirect communications.

At the same time, the motion capabilities of the devices call for a new communication paradigm, where mobility is seen as a facility to exploit in order to improve the performance of the network. In this direction, the classical ISO/OSI layered approach for communications should be reconsidered in order to include the mobility of the devices among the network control primitives, as well as evolution and optimization.

In fact, in WNR some or all of the devices are expected to have memory and reasoning capabilities, which allow them to use the input coming from other devices, the environment and their history to select the best behaviour to assume according to mission objectives. Therefore, machine learning and cognitive networks concepts and algorithms would greatly contribute to WNR theory and algorithms.

This special issue aims to bring together state-of-the-art contributions on the theory, algorithms and applications of wireless networked robotics. Original, unpublished contributions are solicited in all aspects of this discipline.

About the Topics of Interest

In particular, the topic of interest includes but is not limited to

- **algorithm and theory of cooperation and coordination in WNR**
- **modelization, simulation and evaluation of coordination and cooperation schemes in WNR**
- **communication and motion aware protocols for WNR**
- **impact and optimization of network performance through physical and communication control of the devices**
- **bio-inspired algorithms for cooperation and coordination in WNR**
- **self-organization in WNR**
- **swarm intelligence and swarm robotics algorithms in WNR**
- **use cases and applications for WNR**

Submission Format and Guideline

All submitted papers must be clearly written in excellent English and contain only original work, which has not been published by or is currently under review for any other journal or conference. Papers must not exceed 25 pages (one-column, at least 11pt fonts) including figures, tables, and references. A detailed submission guideline is available as “Guide to Authors” at www.elsevier.com/locate/adhoc.

All manuscripts and any supplementary material should be submitted through Elsevier Editorial System (EES). The authors must select as “SI – Wireless Networked Robotics” when they reach the “Article Type” step in the submission process. The EES website is located at: http://ees.elsevier.com/adhoc/

All papers will be peer-reviewed by three independent reviewers. Requests for additional information should be addressed to the guest editors.