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Algorithms for Sensor Systems

Ljubljana, Slovenia, September 13-14, 2012
Revised Selected Papers
Preface

Wireless ad hoc sensor networks have recently become a very active research subject because of their high potential of providing diverse services to numerous important applications, including remote monitoring and tracking in environmental applications and low-maintenance ambient intelligence in everyday life. The effective and efficient realization of such large-scale, complex ad-hoc networking environments requires intensive, coordinated technical research and development efforts, especially in power-aware, scalable, robust wireless distributed protocols, owing to the unusual application requirements and the severe resource constraints of the sensor devices. On the other hand, a solid foundational background seems necessary for sensor networks to achieve their full potential. It is a challenge for abstract modeling, algorithmic design and analysis to achieve provably efficient, scalable, and fault-tolerant realizations of such huge, highly dynamic, complex, nonconventional networks. Features including the extremely large number of sensor devices in the network, the severe power, computing, and memory limitations, their dense, random deployment and frequent failures, pose new interesting abstract modeling, algorithmic design, analysis and implementation challenges of great practical impact. ALGOSENSORS aims to bring together research contributions related to diverse algorithmic and complexity theoretic aspects of wireless sensor networks.

Starting in 2011, ALGOSENSORS broadened its thematic scope, keeping its focus on sensor networks, but also including other related types of ad hoc wireless networks, such as mobile networks, radio networks, and distributed systems of robots. Papers are solicited into two tracks, one on Sensor Networks (Track A) and one on Ad Hoc Wireless and Mobile Systems (Track B). Furthermore, the status of the event has been upgraded to a symposium and its length extended to two days. ALGOSENSORS 2012, the 8th International Symposium on Algorithms for Sensor Systems, Wireless Ad Hoc Networks and Autonomous Mobile Entities, was held in Ljubljana, Slovenia, during September 13–14, 2012.

In 2012, there were 24 submissions to ALGOSENSORS: 14 to track A and ten to track B. After a careful selection procedure by the (joint) Program Committee (involving at least four reviews for each paper and five reviews for the vast majority papers, and fruitful discussions), 11 papers were accepted as full papers: five of them from track A and six of them from track B. In addition, two papers from track B were accepted as brief announcements. This volume contains these papers as well as summaries of the two keynote talks.

The five papers in Track A (Sensor Networks) present original research on topics such as barrier resilience, localization, connectivity with directional antennas, broadcast scheduling, and data aggregation. The topics covered by the
six papers in Track B (Ad hoc Wireless and Mobile Systems) include the SINR model, geometric routing, cognitive radio networks, video delivery, and mapping polygons.

We would like to warmly thank the ALGO/ESA 2012 organizers for kindly accepting the proposal of the Steering Committee to co-locate ALGOSENSORS with some of the leading events on algorithms in Europe. Also, we thank the keynote speakers Subhash Suri and Thomas Kesselheim for accepting our invitation. Many thanks go to the Program Committee members for their dedicated contribution toward a strong program.

October 2012

Amotz Bar-Noy
Magnús M. Halldórsson
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Subhash Suri  UCSB, USA
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Amy Y. Wang  Tsinghua University, China

Additional Referees

Benny Applebaum  Thomas Kesselheim  Xi Ming Li
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