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The rapid and continued growth of wireless technology made information accessible anywhere and at any time. In addition to wireless networks based on a pre-existing infrastructure, where wireless communications take place only between the end-nodes and the access points, mobile ad hoc networks and sensor networks are emerging rapidly. Such networks pose challenges in several distinct areas such as network topology control, media access, routing, energy consumption, security, and data broadcast scheduling.

This special issue brings together algorithmic contributions in discrete mathematics, optimization techniques, and performance evaluation methods in the context of cellular, ad-hoc, and sensor networks.

The 4th International Workshop on Algorithms for Wireless, Mobile, Ad Hoc and Sensor Networks (WMAN04) was held in Santa Fe, New Mexico, USA, on April 30, 2004. Twenty papers were presented, out of which only the five papers below have been selected for publication on the present special issue.

The first two papers deal with routing in topology-dependent and topology-transparent models.

The paper “Addressing, Distances and Routing in Triangular Systems with Applications in Cellular Networks”, by V. Chepoi, F.F. Dragan, and Y. Vaxes, uses triangular systems to model cellular networks and proposes addressing and labelling schemes, by proper embedding, that allow an

efficient implementation of distance and movement based tracking protocols.

The paper “The Effects of Synchronization on Topology-Transparent Scheduling”, by W. Chu, C.J. Colbourn, and V.R. Syrotiuk, considers medium access control schedules which are topology-transparent, where no neighbour information is used, and investigates several synchronization models along with their impact on the existence of schedules and delay.

The next two papers deal with energy efficiency in sensor networks.

The paper “Energy Balanced Data Propagation in Wireless Sensor Networks”, by C. Efthymiou, S. Nikolettseas, and J. Rolim, proposes a new algorithm for energy-balanced data propagation that in each step decides whether to propagate data directly to the sink or just one-hop towards the sink.

The paper “Energy Efficient Node-to-Node Authentication and Communication Confidentiality in Wireless Sensor Networks”, by R. Di Pietro, L.V. Mancini, and A. Mei, introduces a new threat model to communications confidentiality that implements secure pairwise communications among any pair of sensors.

The last paper “Jitter-Approximation Tradeoff for Periodic Scheduling” by Z. Brakerski and B. Patt-Shamir, considers an asymmetric wireless communication setting, where a server periodically broadcasts data items on a single channel preferring schedules with low jitter so as to minimize the energy consumption of the mobile clients.

The guest editors wish to thank all the referees for their valuable comments and suggestions, and all the authors for their high quality submissions. Special thanks go to the Editor-in-Chief of Wireless Networks for hosting this special issue.

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**Alan Bertossi** was born in London (England) in 1956. He got the Laurea Degree *summa cum laude* in Computer Science from the University of Pisa (Italy) in 1979. Afterwards, he worked as a System Programmer and Designer. From 1983 to 1994 he was with the University of Pisa as a Research Associate first, and later as an Associate Professor. From 1995 to 2002 he was with the University of Trento (Italy), as a Full Professor. Since 2002, he has

been with the Department of Computer Science of the University of Bologna (Italy), as a Professor of Computer Science. His main research interests are the computational aspects of high-performance, parallel, VLSI, distributed, fault-tolerant, and real-time systems.

He has published about 40 refereed papers on international journals, as well as several papers in international conferences, workshops, and encyclopedias. He has authored a book (on design and analysis of algorithms, in Italian) and he served as a guest coeditor for special issues of *Algorithmica*, *Discrete Applied Mathematics*, and *Mobile Networks and Applications*. He is a member of the editorial board of *Information Processing Letters*.

His biography is included in the 1999 edition of *Who's Who in the World* and in the 2000 edition of *Who's Who in Science and Engineering*. Since 1999, he has been a scientific collaborator at the Institute of Information Sciences and Technologies of the Italian National Research Council (ISTI-CNR, Pisa, Italy). During 2001–2003, he was the national coordinator of an Italian research project on algorithms for wireless networks.



**Azzedine Boukerche** is a Full Professor and he holds a Canada Research Chair position at the University of Ottawa. He is the Founding Director of PARADISE Research Laboratory at Ottawa U. Prior to this, he held a faculty position at the University of North Texas, USA, and he was working as a Senior Scientist at the Simulation Sciences Division, Metron Corporation located in San Diego. He was also employed as a Faculty at the School of Computer

Science McGill University, and taught at Polytechnic of Montreal. He spent a year at the JPL/NASA-California Institute of Technology where he contributed to a project centered about the specification and verification of the software used to control interplanetary spacecraft operated by JPL/NASA Laboratory.

His current research interests include wireless networks, mobile and pervasive computing, wireless multimedia, QoS service provisioning, wireless ad hoc and sensor networks, performance evaluation and modeling of large-scale distributed systems, distributed computing, large-scale distributed interactive simulation, and parallel discrete event simulation. Dr. Boukerche has published several research papers in these areas. He was the recipient of the Best Research Paper Award

at IEEE/ACM PADS'97, and the recipient of the 3rd National Award for Telecommunication Software 1999 for his work on a distributed security systems on mobile phone operations, and has been nominated for the best paper award at the IEEE/ACM PADS'99, ACM MSWiM 2001, and ACM MobiWac 2004. He is a Co-Founder of QShine Int'l Conference, and served as a General Chair for the first Int'l Conference on Quality of Service for Wireless/Wired Heterogeneous Networks (QShine 2004), ACM/IEEE MASCOT 1998, IEEE DS-RT 1999–2000, ACM MSWiM 2000; Program Chair for ACM/IFIPS Europar 2002, IEEE/SCS Annual Simulation Symposium ANNS 2002, ACM WWW'02, IEEE/ACM MASCOTS 2002, IEEE Wireless Local Networks WLN 03-04; IEEE WMAN 04-05, ACM MSWiM 98-99, and TPC member of numerous IEEE and ACM conferences. He served as a Guest Editor for the Journal of Parallel and Distributed Computing (JPDC), and ACM/Kluwer Wireless Networks and ACM/Kluwer Mobile Networks Applications, and the Journal of Wireless Communication and Mobile Computing. Dr. A. Boukerche serves as an Associate Editor and on the editorial board for ACM/Kluwer Wireless Networks, the Journal of Parallel and Distributed Computing, and the SCS Transactions on simulation. He also serves as a Steering Committee Chair for the ACM Modeling, Analysis and Simulation for Wireless and Mobile Systems Symposium, the ACM Workshop on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks and the IEEE Distributed Simulation and Real-Time Applications Symposium (DS-RT). He is a member of ACM and IEEE.



**M. Cristina Pinotti** received the Dr. degree *summa cum laude* in Computer Science from the University of Pisa, Italy, in 1986. During 1987–1999 she has been a Researcher with the National Council of Research at the Istituto di Elaborazione dell'Informazione, Pisa. From 2000–2003 she has been an Associate Professor at the University of Trento. From 2004, she is a Full Professor at the University of Perugia. In 1994 and 1995 she was a Research Associate at the Department of Computers Sciences, University of North Texas, Denton, TX. In 1997 she visited the Department of Computer Science, Old Dominion University, Norfolk, VA (USA).

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She served as General Chair of IEEE WMAN 04-05 and as TPC member of several IEEE conferences. She has been a guest co-editor for a special issue of *Mobile Networks and Applications*. She is a member of the editorial board of *International Journal of Parallel, Emergent and Distributed Systems*.