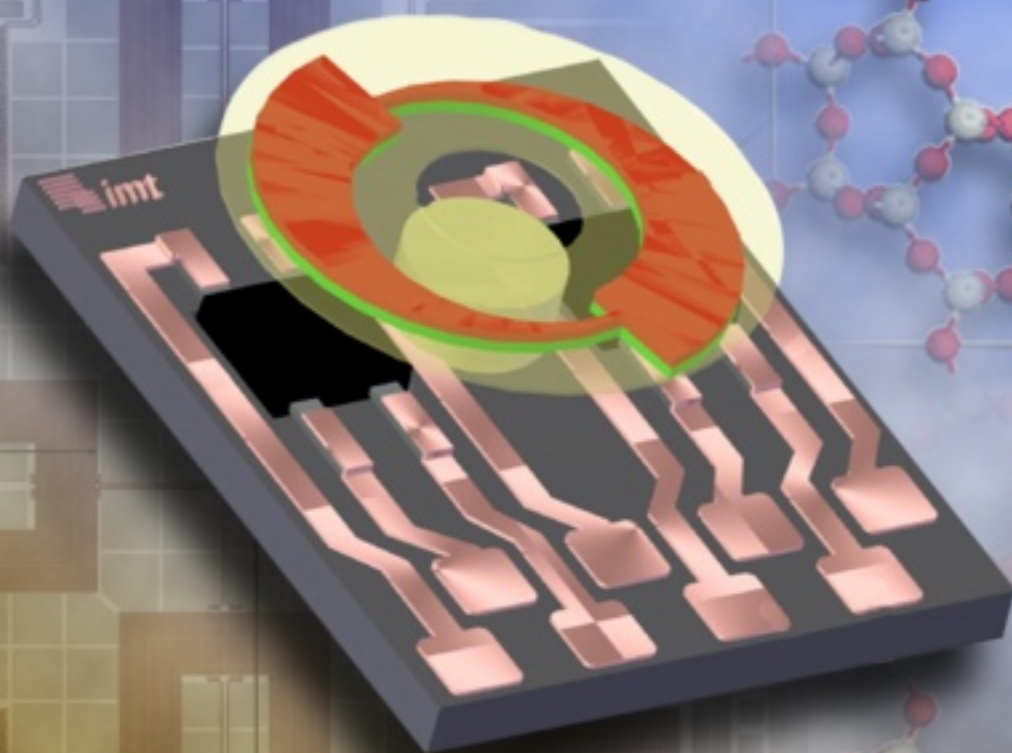


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Please visit journal's webpage with preparation instructions: <http://www.sensorsportal.com/HTML/DIGEST/Submission.htm>



Foreword

The 12th annual NSTI Nanotechnology Conference and Trade Show were held this year in May 3rd to 7th at the George R. Brown Convention Center, Houston, Texas, USA. The conference was co-located with Nano & Clean Technology Ventures, a series of Nanotech Workshops, Clean Technology 2009 and TechConnect 2009 - IP & Ventures. Overall, in excess of 3000 attendees and 200 exhibitors were hosted by the conference organizers, while the resulting proceedings boasts over 2000 pages of peer-reviewed micro and nanotechnology research.

Following two successful Special Issues in 2007 and 2008, this year, again, a number of authors publishing in the Joint **Electronics and Microsystems** Symposia track were invited to submit a revised version of their Nanotech09 papers to this journal special issue. Invitations were issued to best papers selected from a number of symposia within the track, including: MEMS & NEMS, Sensors & Systems, Micro & Nano Fluidics, and MSM – Modeling Microsystems. These symposia brought together researchers from a number of disciplines to discuss topics ranging from theoretical developments, to design and fabrication, through to industrial applications of MEMS and NEMS sensors, devices and systems.

The joint symposia are motivated by the dream of smarter, smaller, and more complex systems that integrate micro and nano system technologies with intelligence, power and communication ability at the same micro or nano scale. The resulting increase in complexity poses an enormous challenge to engineers when designing, modeling, and fabricating such integrated micro and nano systems. The joint symposia offered researchers from different disciplines a forum to exchange ideas about how to best develop usable and commercially viable micro and nano systems. A special feature of this year's **Smart Sensors and Systems** Symposium was the theme of Wireless Sensor Networks for Real-Life Applications. This became a central feature of the event with a series of eight keynote and invited talks on a variety of leading edge applications of the technology, as follows:

MEMS & Wireless: bringing the power of the small to the people

Elena I. Gaura, Cogent Computing, Coventry University, UK, **Symposium Opening Keynote**

Wireless and Mobile Sensor Networks for Smart Civil Structures

Yang Wang, Assistant Professor, Georgia Institute of Technology, Invited talk

Wireless sensor networks for space applications

Driss Benhaddou, Assistant Professor, Engineering Technology

University of Houston, Invited talk

A Design Environment for the Cost Optimization of Wireless Sensor Networks, Michael Niedermayer, Fraunhofer Institute for Reliability and Microintegration, Germany, Invited talk

Wireless Sensor Networks to empower the Amateur Home Eco Scientist, James Brusey, Senior Lecturer in Computer Science, Faculty of Engineering and Computing, Coventry University, UK, Invited talk

Wireless Sensor Networks for Emergency Response Applications, Radu Stoleru, Assistant Professor, Department of Computer Science and Engineering, Texas A&M University, Invited talk

Experiences in Engineering Wireless Sensor Networks for Glaciers, Kirk Martinez, University of Southampton UK, Invited talk

MEMS & Wireless: from devices to microrobotic swarms, Dan Popa, Assistant Professor of Electrical Engineering Automation & Robotics Research Institute at UT Arlington, Invited talk

The interested reader can find further details on the symposium and the wireless sensing sessions, together with all the invited and keynote presentations at www.coventry.ac.uk/researchnet/d/489/a/6638

As with the wide micro and nano technologies span of the joint symposia, this journal special issue includes papers ranging from those reporting on end-to end real-life sensing applications and systems to those covering low-level physical aspects of micro and nano sensors and devices, their proof of concept, characterization, modeling and fabrication. Samples of leading-edge device research are brought forth by this Special Issue, on: novel strain gauge design, carbon nanotubes and nanowires modeling and synthesis and sophisticated electro-thermo-mechanical modeling of microstructures, microfabricated rotational actuators, and a revolutionary MEMS-based Ultra-High Data Density Memory Device. At systems and applications level, the papers selected for the issue report on several biosensors applications coupled with high level wireless sensing systems deployed to achieve enhanced occupants comfort in buildings and enhanced safety in space and ground applications.

From the symposia submissions, 50 papers were selected and authors invited to submit extended versions of their conference publication. Of these, following peer-reviewing, 24 were selected to be published in this special issue.

We are very thankful both to the NSTI directors and Nanotech chairs (Dr. Matthew Laudon and Dr. Bart Romanovicz) and to the *Sensors & Transducers* editors for offering the opportunity to publish this special issue.

Enjoy!

Elena Gaura and James Brusey

Guest Editors:



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Elena Gaura received her BSc and MSc in Electrical Engineering from the Technical University of Cluj Napoca, Romania in 1989 and 1991, respectively.

In 1992 she joined the Technical University of Cluj Napoca on a professional basis. In 1996 she came to the UK, initially as a Research Assistant at Brunel University, Uxbridge. In 1998 she joined Coventry University, in order to pursue her PhD, researching the integration of Artificial Intelligence and MEMS sensors to produce enhanced performance Smart Microsystems. By the time her PhD was awarded in 2000, she was serving as a Senior Lecturer in Computer Science at Coventry University. She was further appointed as inaugural director of the Coventry University's Cogent Computing Applied Research Centre in 2006, position she continues to hold. Over the course of her career, she has accrued a sturdy academic reputation in the area of smart sensing systems in general and wireless sensor networks in particular. She is an active disseminator of research both to the academic community and the industry, has over 120 refereed publications, and is a frequent organizer of Smart Sensing events.

Dr Gaura is a member of several microsystems advisory bodies, including the EPSRC College of Peers, and chair of the UK Wireless Intelligent Sensing Interest Group (WiSIG).

Presently her research is with the development of deployable Wireless Sensor Networks for real-life applications with a focus on: i) system design, ii) MEMS technology integration, iii) enabling closed loop actuation based on multi-type sensing and sensor fusion, iv) integration of decision engines within poorly resourced WSN systems and v) field phenomena event detection and representation, with the ultimate aim of designing autonomous systems capable of large scale field sensing.



Dr. James P. Brusey

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James Brusey received the BSc degree in Computer Science and the PhD degree from RMIT University (Melbourne, Australia) in 1996, and 2003, respectively.

In 2002, he joined the Institute for Manufacturing, a division of the Cambridge University Engineering Department, as a Senior Research Fellow. Funding during this period included EU Framework 6 project, Cambridge-MIT Institute funding, and funding from the Auto-ID Centre. In 2007, he joined the Coventry University Cogent Computing Applied Research Centre as a Senior Lecturer and Senior Research Fellow. His current research interests include: Bayesian approaches to state estimation for Wireless Sensor Networks,

middleware and design patterns for WSNs, sensor node placement optimization. His PhD thesis entitled Learning Behaviours for Robot Soccer won the Australian Computer Science Association Award for best PhD thesis in 2004.

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Guide for Contributors

Aims and Scope

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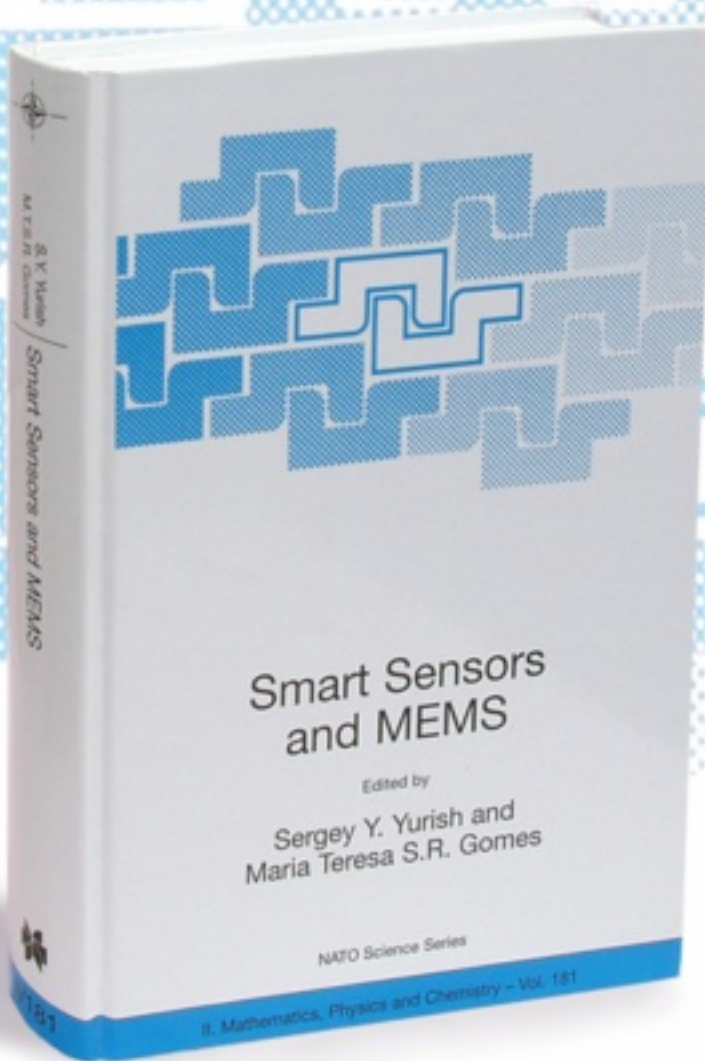
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