

4th International Conference on Distributed
Computing in Sensor Systems

DCOSS 2008



June 11-14, 2008

Santorini Island, Greece

DCOSS 2008 Program

THURSDAY, JUNE 12, 2008

8:50 am - 9:00 am: **OPENING REMARKS**

9:00 am - 10:00 am: **KEYNOTE ADDRESS**

Matt Welsh (Harvard University, USA)

"Sensor Networks for the Sciences: Lessons from the Field"

10:00 am - 10:20 am: Coffee Break

10:20 am - 12:00 pm: **SESSION 1: ALGORITHMS**

Soeren Laue, Stefan Funke, Rouven Naujoks and Zvi Lotker. *Power Assignment Problems in Wireless Communication: Covering Points by Disks, Reaching few Receivers Quickly, and Energy-efficient Travelling Salesman Tours*

Andreas Wiese and Evangelos Kranakis. *Local PTAS for Independent Set and Vertex Cover in Location Aware Unit Disk Graphs*

Olga Saukh, Robert Sauter and Pedro José Marrón. *Time-bounded and Space-bounded Sensing in Wireless Sensor Networks*

Matthew P. Johnson, Hosam Rowaihy, Diego Pizzocaro, Amotz Bar-Noy, Stuart Chalmers, Thomas La Porta and Alun Preece. *Frugal Sensor Assignment*

Adriano Fagiolini, Lisa Tani, Antonio Bicchi and Gianluca Dini. *A Distributed Algorithm for Optimal Connected Sensing Coverage with Mobile Nodes (short paper)*

Chun Lung Lin, Hai Fu Wang, Sheng Kai Chang, and Jia Shung Wang. *Optimal Rate Allocation for Rate-constrained Applications in Wireless Sensor Networks (short paper)*

12:00 pm - 1:40 pm: Lunch Break

1:40 pm - 3:40 pm: **SESSION 2: SYSTEMS**

Zhong-Yi Jin and Rajesh Gupta. *Improved Distributed Simulation of Sensor Networks based on Sensor Node Sleep Time*

Emiliano Miluzzo, Nicholas Lane, Andrew T. Campbell and Reza Olfati-Saber. *CaliBree: a Self-Calibration System for Mobile Sensor Networks*

Pascal von Rickenbach and Roger Wattenhofer. *Decoding Code on a Sensor Node*

Isaac Amundson, Branislav Kusy, Peter Volgyesi, Xenofon Koutsoukos and Akos Ledeczi. *Time Synchronization in Heterogeneous Sensor Networks*

Yu-Shian Chen, I-Lun Lin, Chin-Laung Lei and Yen-Hua Liao. *Broadcast Authentication in Sensor Networks using Compressed Bloom Filters*

Wei Dong, Chun Chen, Xue Liu, Kougen Zheng, Rui Chu and Jiajun Bu. *FIT: A Flexible, Light-Weight and Real-Time Scheduling System for Wireless Sensor Platforms*

3:40 pm - 4:00 pm: Coffee Break

4:00 pm - 6:00 pm: **SESSION 3: ALGORITHMS**

Yuliy Baryshnikov, Kyung Joon Kwak, Edward Coffman and Bill Moran. *Stochastic Counting in Sensor Networks, or: Noise is Good*

Joon Ahn and Bhaskar Krishnamachari. *Performance of a Propagation Delay Tolerant ALOHA Protocol for Underwater Wireless Networks*

Alexandre Guitton, Niki Trigoni and Sven Helmer. *Fault-tolerant Compression Algorithms for Delay-sensitive Sensor Networks with Unreliable Links*

Zhiguo Zhang, Ajay Kshemkalyani and Sol Shatz. *Multi-root, Multi-query Processing in Sensor Networks*

Cheng Qian and Hairong Qi. *Coverage estimation in the presence of occlusions for visual sensor networks*

Animesh Pathak and Viktor Prasanna. *Energy-Efficient Task Mapping for Data-driven Sensor Network Macroprogramming (short paper)*

Bo Jiang, Binoy Ravindran and Hyeonjoong Cho. *Energy Efficient Sleep Scheduling in Sensor Networks for Multiple Target Tracking (short paper)*

6:15 pm - 7:15 pm: **WORK IN PROGRESS SESSION**

7:15 pm - 8:30 pm: **POSTERS, DEMOS AND WELCOME RECEPTION**

FRIDAY, JUNE 13, 2008

8:20 am - 9:20 am: **KEYNOTE ADDRESS**

David Peleg (Weizmann Institute of Science, Israel)
"Efficient broadcast in Wireless Sensor Networks"

9:20 am - 10:20 am: **SESSION 4: SYSTEMS**

Bor-rong Chen, Geoffrey Peterson, Geoffrey Mainland and Matt Welsh. *LiveNet: Using Passive Monitoring to Reconstruct Sensor Network Dynamics*

Arvind Seshadri, Mark Luk and Adrian Perrig. *SAKE: Software Attestation for Key Establishment in Sensor Networks*

Qihua Cao and John Stankovic. *An In-Field-Maintenance Framework for Wireless Sensor Networks (short paper)*

Sangho Yi, Seungwoo Lee, Yookun Cho and Jiman Hong. *SESAME-P: Memory Pool-based Dynamic Stack Management for Resource-Constrained Embedded Systems (short paper)*

10:20 am - 10:40 am: Coffee Break

10:40 am - 12:20 pm: **SESSION 5: APPLICATIONS**

Yi Fei Dong, Salil Kanhere, Chun Tung Chou and Nirupama Bulusu. *Automatic collection of fuel prices from a network of mobile cameras*

Hugo Conceição, Michel Ferreira and João Barros. *On the Urban Connectivity of Vehicular Sensor Networks*

Mihai Marin-Perianu, Clemens Lombriser, Oliver Amft, Paul Havinga and Gerhard Troster. *Distributed Activity Recognition with Fuzzy-Enabled Wireless Sensor Networks*

Supriyo Chatterjea and Paul Havinga. *An Adaptive and Autonomous Sensor Sampling Frequency Control Scheme for Energy-Efficient Data Acquisition in Wireless Sensor Networks*

Luca Filipponi, Silvia Santini and Andrea Vitaletti. *Data Collection in Wireless Sensor Networks for Noise Pollution Monitoring (short paper)*

Nam Pham and Tarek Abdelzaher. *Robust Dynamic Human Activity Recognition based on Relative Energy Allocation (short paper)*

12:20 pm - 1:40 pm: Lunch Break

1:40 pm - 2:40 pm: **KEYNOTE ADDRESS**

Christos Papadimitriou (University of California at Berkeley, USA)
"The Algorithmic Lens: How the Computational Perspective is Transforming the Sciences"

2:40 pm - 3:40 pm: **SESSION 6: DCOSS 08 Best Papers**

Algorithms Track: Venkatesan Ekambaram, Tarun Agarwal and P. Vijay Kumar. *On the average case communication complexity for detection in sensor networks*

Systems Track: Ryo Sugihara and Rajesh Gupta. *Improving the Data Delivery Latency in Sensor Networks with Controlled Mobility*

Applications Track: Hany Morcos, George Atia, Azer Bestavros and Abraham Matta. *An Information Theoretic Framework for Field Monitoring Using Autonomously Mobile Sensors*

3:40 pm - 4:00 pm: Coffee Break

4:00 pm - 5:00 pm: **SESSION 7: ALGORITHMS**

Yann Busnel, Leonardo Querzoni, Roberto Baldoni, Marin Bertier and Anne-Marie Kermarrec. *On the deterministic tracking of moving objects with a binary sensor network*

Yuh-Jzer Joung. *Tug-of-War: An Adaptive and Cost-Optimal Data Storage and Query Mechanism in Wireless Sensor Networks*

Novella Bartolini, Tiziana Calamoneri, Emanuele Guido Fusco, Annalisa Massini and Simone Silvestri. *Snap and Spread: a self-deployment algorithm for mobile sensor networks (short paper)*

Sylvie Delaet, Partha Sarathi Mandal, Mariusz A. Rokicki and Sebastien Tixeuil. *Deterministic Secure Positioning in Wireless Sensor Networks (short paper)*

5:00 pm - 6:20 pm: **SESSION 8: SYSTEMS**

Shane Eisenman, Nicholas Lane and Andrew T. Campbell. *Techniques for Improving Opportunistic Sensor Networking Performance*

Mohammad Khan, Tarek Abdelzaher and Kamal Gupta. *Towards Diagnostic Simulation in Sensor Networks*

Jung-Eun Kim, Man-Ki Yoon, Junghee Han and Chang-Gun Lee. *Sensor Placement for 3-Coverage with Minimum Separation Requirements*

Anthony Wood, Leo Selavo and John Stankovic. *SenQ: An Embedded Query System for Streaming Data in Heterogeneous Interactive Wireless Sensor Networks (short paper)*

Vladimir Dyo and Cecilia Mascolo. *Efficient Node Discovery in Mobile Wireless Sensor Networks (short paper)*

7.45 pm: **SOCIAL DINNER (at Sphinx Restaurant)**

WEDNESDAY, JUNE 11, 2008 - DCOSS 08 WORKSHOPS I

- International Workshop on Information Theory for Sensor Networks (WITS)

8:45-9:00 Opening Remarks

9:00-10:30 Keynote Address

Energy Efficient Cooperative Inference in Sensor Networks

Anthony Ephremides

10:30-11:00 Break

Main Session

11:00-11:30 An Equivalence Approach to Network Capacity

Michelle Effros

11:30-12:00 Decentralized Detection in a Dense Wireless Sensor Network with Correlated Observations

J. P.-Chaves, M. Lázaro, and A. Artés-Rodríguez

12:00-12:30 Minimax Risks for Distributed Estimation

M. Madiman, A. R. Barron, A. M. Kagan and T. Yu

12:30-12:40 Closing

- International Workshop on Sensor Network Engineering (IWSNE)

09:00 - 10:30 Management

- *Management of Wireless Sensor Networks using TCP/IP*

Markus Anwander, Gerald Wagenknecht, and Torsten Braun

- *Dynamic Software Management on BNode Sensors*

Falko Dressler, Moritz Strübe, Rüdiger Kapitza and Wolfgang Schröder-Preikschat

- *Passive Distributed Assertions for Sensor Networks*

Kay Römer

10:30 - 11:00 Coffee Break

11:00 - 12:30 Sensor Platforms and Test Beds

- *The Evolution of the GridStix Wireless Sensor Network Platform*

Geoff Coulson, Danny Hughes, Gordon Blair, and Paul Grace

- *A hybrid Testbed for long-term Wireless Sensor Network Studies*

Mesut Günes, Bastian Blywis, and Jochen Schiller

- *PowerBench: A Scalable Testbed Infrastructure for Benchmarking Power Consumption*

Ivaylo Haratcherev, Gertjan Halkes, Tom Parker, Otto Visser, and Koen Langendoen

12:30 - 13:30 Lunch Break

13:30 - 15:30 Simulation and Diverse

- *Making WSN Simulation More Realistic: a Case Study*

Jochen Koberstein, Hagen Peters, and Norbert Luttenberger

- *Coalescing simulation and embedded WSN application development*

Dennis Pfisterer and Carsten Buschmann

- *Making Security Useable in Wireless Sensor Networks*

Stefan Ransom, Dennis Pfisterer, and Stefan Fischer

- *Efficient Slot Assignment for the Many-to-One Routing Pattern in Sensor Networks*

Volker Turau, Christoph Weyer, and Christian Renner

15:30 - 16:00 Coffee Break

16:00 - 17:00 Working Session

- International Workshop on Cyber-Physical Systems Challenges and Applications (CPS-CA)

Session 1 (9:00 - 10:30)

09:00 - 09:15 Welcome Address
09:15 - 10:00 *Time for Cyber-Physical Systems*
Keynote Talk Alan Burns
10:00 - 10:30 *Localizing Objects in Large-Scale Cyber-Physical Systems*
Björn Andersson and Shashi Prabh

Coffee/Tea Break (10:30 - 11:00)

Session 2 (11:00 - 12:30)

11:00 - 11:45 *Specknet-Based Cyber-Physical Frameworks*
Keynote Talk D. K. Arvind and A. P. Kulkarni
11:45 - 12:15 *Passivity-Based Control Design for Cyber-Physical Systems*
X. Koutsoukos, N. Kottenstette, J. Hall, P. Antsaklis
and J. Sztipanovits

12:15 - 12:30 **Brief Announcements and Position Statements I**

Lunch (12:30 - 14:00)

Session 3 (14:00 - 15:30)

14:00 - 14:45 *Cyber-Physical Systems: Trends and Challenges*
Keynote Talk Vicraj T. Thomas
14:45 - 15:15 *Mechanisms to Provide Integrity in SCADA and PCS Devices*
Aakash Shah, Adrian Perrig and Bruno Sinopoli

15:15 - 15:30 **Brief Announcements and Position Statements II**

Coffee/Tea Break (15:30 - 16:00)

Session 4 (16:00 - 16:30)

16:00 - 16:30 *The Multivision problem for Wireless Sensor Networks: a discussion about Node and Network architecture*
Paolo Pagano, Christian Nastasi and Yao Liang

Session 5 (16:30 - 17:30)

16:30 - 17:15 *CPS: Challenges and Applications*
Panel Discussion Panelists: D.K. Arvind, A. Burns, V. Thomas, E. Tovar, Representative from EC
17:15 - 17:30 Closing Remarks

SATURDAY, JUNE 14, 2008 - DCOSS 08 WORKSHOPS II

- International Workshop on Energy in Wireless Sensor Networks (WEWSN)

9:15 - 9:30 **Opening Remarks**

9:30 - 10:30 **Invited Talk**

Andrea Acquaviva

10:30 - 11:00 **Coffee/Tea Break**

11:00 - 12:00 **Session 1: Hardware and Software Design**

Power monitoring and testing in Wireless Sensor Network Development

Matthias Woehrle, Jan Beutel, Roman Lim, Mustafa Yucecel and Lothar Thiele

Miniaturized Solar Scavengers for Ultra-low Power Wireless Sensor Nodes

Davide Brunelli

12:00 - 14:00 **Lunch Break**

14:00 - 15:30 **Session 2: Network Layer Protocols**

VIBE: a Virtual-Infrastructure-Based Energy-efficient Framework for Routing over Scalable Wireless Sensor Networks

Aris Papadopoulos, Alfredo Navarra and Julie McCann.

Energy-efficient Selective Forwarding for Sensor Networks

Rocio Arroyo-Valles, Antonio Garcia-Marques and Jesus Cid-Sueiro.

Balancing Energy Expenditure in WSNs through Reinforcement Learning: A Study

Anna Förster and Amy L. Murphy.

15:30 - 16:00 **Coffee/Tea Break**

16:00 - 17:00 **Session 3: MAC and Scheduling Algorithms**

Maximising Sensor Network Efficiency Through Agent-Based Coordination of Sleep/Sense Schedules

Alessandro Farinelli, Alex Rogers and Nick Jennings.

Multi-radio Medium Access Control Protocol for Wireless Sensor Networks

Junaid Ansari, Xi Zhang and Petri Mähönen.

17:00 - 17:30 **Discussion**

- ProSense Special Session and International Workshop on Wireless Sensor Network Deployments (WiDeploy)

09:00 - 10:40 **Session 1**

09.00 - 09.25: Ivan Stojmenovic, How to Write Research Articles in Computer Science and Related Engineering Disciplines

09.25 - 09.50: Olivier Powell, Passive and Lightweight Target Tracking for Sensor Networks

09.50 - 10.15: Athanassios Kinalis and Sotiris Nikolettseas, Adaptive Data Propagation for Diverse Sensory Mobility

10.15 - 10.40: Marcus Chang, Cecile Cornou, Klaus S. Madsen, Philippe Bonnet, Lessons from the Hogthrob Deployments

10:40 - 11:10 Coffee/Tea Break

11:10 - 12:25 Session 2

11.10 - 11.35: Animesh Pathak and Viktor K. Prasanna, Srijan: A Graphical Toolkit for WSN Application Development

11.35 - 12.00: Jayant Gupchup, Abhishek Sharma, Andreas Terzis, Randal Burns, Alex Szalay, The Perils of Detecting Measurement Faults in Environmental Monitoring Networks

12.00 - 12.25: Richard Mason, Binh Pham, Paul Roe, Jinglan Zhang, Andy Lau, Mark Richards, Monitoring the Environment through Acoustics using Smartphone-based Sensors and 3G Networking

12:25 - 14:00 Closing and Lunch break

- International Workshop on Localized Algorithms and Protocols for Wireless Sensor Networks (LOCALGOS)

Welcome and Introduction

14:00 Keynote Speech

David Simplot-Ryl

14:30 Session 1: Topology Control

- Impact of Locality on Location Aware Unit Disk Graphs
Andreas Wiese and Evangelos Kranakis

- Local 3-approximation in quasi unit-disk graphs
Marja Hassinen, Valentin Polishchuk and Jukka Suomela

15:30 – 16:00 Coffee break

16:00 Session 2: Data gathering and positioning

- Improving Directed Diffusion With Power-Aware Topology Control For Adaptation to High Density
Lyes Khelladi and Nadjib Badache

- Impact on Accuracy of Deployment Trade-Offs in Localized Sensor Network Event Detection
Farhana Jabeen and Alvaro A. A. Fernandes

- Position and Orientation Calibration of Ad-Hoc Wireless Sensor Networks
Kung Yao and Juo-Yu Lee

17:30 Closing of the workshop

Demo Papers

- *Service Oriented Architecture for Heterogeneous and Dynamic Sensor Networks*, Jérémie Leguay, Mario Lopez-Ramos, Kathlyn Jean-Marie, Vania Conan
- *Virtual Flashlight: A Demonstration of Cantennas for Wireless Sensor Networks*, Robert Sauter, Olga Saukh, Jonas Meyer, Pedro Jose Marron
- *Pixie: An Operating System for Resource-Aware Programming of Embedded Sensors*, Bor-rong Chen, Konrad Lorincz, Jason Waterman, Matt Welsh
- *An Interactive Testbed for Heterogeneous Wireless Sensor Networks*, Olof Rensfelt, Frederik Hermans, Christofer Ferm, Per Gunningberg, Lars-Åke Larzon
- *MobiShop: Using Mobile Phones for Sharing Consumer Pricing Information*, Shitiz Sehgal, Salil S. Kanhere, Chun Tung Chou
- *TDOA-based Real Time Locating System over IEEE 802.15.4 radio*, Hyuntae Cho, Hoon Choi, Yeonsu Jung, Hyunsung Jang, Sanghyun Son, Yunju Baek

Work in Progress (WIP) Papers

- *Revisiting the Cramer-Rao Bound for Localization Algorithms*, Stefan Dulman, Paul Havinga, Aline Baggion, Koen Langendoen
- *FireSense: Forest Fire Prediction and Detection System using Wireless Sensor Networks*, Gurhan Kucuk, Bilgin Kosucu, Arda Yavas, Sebnem Baydere
- *Towards Distributed Event Detection in Wireless Sensor Networks*, Norman Dziengel, Georg Wittenburg, Jochen Schiller
- *A Priority Based Data Transfer Protocol for BusNet*, T. G. T. A. Bandara, Chamath Keppitiyagama, Kasun De Zoysa, Nayanajith M. Laxaman, Kenneth M. Thilakarathna
- *A Cross-Layered Communication Architecture for WSNs based on Virtual Coordinates*, Thomas Watteyne, Dominique Barthel, Mischa Dohler, Isabelle Auge-Blum
- *A MDA-based development framework for sensor network applications*, Soledad Escolar, Jesus Carretero, Florin Isaila, Giacomo Tartari
- *BurstMAC A MAC Protocol with Low Idle Overhead and High Throughput*, Matthias Ringwald, Kay Roemer

Poster Papers

- *Distributed Data Management in Sensor Networks using miniDB/miniSQL*, Abdalkarim Awad, Wei Xie, Eugen Rose, Reinhard German and Falko Dressler
- *Maximizing Utility of Sensor-Mission Assignment with Uncertain Demands*, Diego Pizzocaro, Matthew P. Johnsony, Hosam Rowaihyz, Stuart Chalmersx, Alun Preece, Amotz Bar-Noyy and Thomas La Porta
- *A declarative approach for Hierarchical-organized Wireless Sensor/Actor Network*, Salvatore F. Pileggi, Carlos E. Palau and Manuel Esteve
- *An Approach for Synthesis and Mapping of Middleware for Wireless Sensor Networks*, Zheng Liu and Cormac J. Sreenan
- *A Distributed Information System Architecture for Supporting Large-Scale Wireless Sensor Network*, Yo-Ming Hsieh and Yu-Cheng Hung
- *Enabling Mobility in Wireless Sensor Networks Cooperating with UAVs for Mission-Critical Management*, Aysegul Tuysuz Erman, Lodewijk van Hoesel and Paul Havinga

- *Minos: A Generic Tool for Sensor Data Acquisition and Storage*, Silvia Santini and Daniel Rauch
- *Variable Sensor Density Algorithm*, Anand kishore Raju, Anshuk Chakraborty, Vishnu Narayanan and Ankur Jain
- *The Credit Algorithm for Memory Enabled Sensors*, Anand kishore Raju, Anshuk Chakraborty, Vishnu Narayanan and Ankur Jain
- *Monitoring and Modeling the Every-Day Behavior of People with Special Needs*, George J. Papamathaiakis, Elias C. Efstathiou, George C. Polyzos and George Xylomenos
- *Decreasing the Localization Error in Border Areas of Sensor Networks*, Jan Blumenthal, Frank Reichenbach and Dirk Timmermann

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