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)


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


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*


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*


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


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

Qiuhua Cao and John Stankovic. An In-Field-Maintenance Framework for Wireless Sensor Networks (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


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*


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)*


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
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 Yucel and Lothar Thiele

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 Nikoletseas, 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


- 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
- 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
- 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 Keppityagama, 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. Pilleggi, Carlos E. Palau and Manuel Esteve
- 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. Papamatthaiakis, Elias C. Efstatiou, 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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- Greek Ministry of National Education and Religious Affairs (http://www.ypepth.gr/)
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DCOSS 08 is supported by:

- Computer Engineering and Informatics Department of U. of Patras
- Research Academic Computer Technology Institute (CTI)
- SensorsLab at CTI/Research Unit 1
- EU R&D Project AEOLUS («Algorithmic Principles for Building Efficient Overlay Computers»)
- EU R&D Project FRONTS («Foundations of Adaptive Networked Societies of Tiny Artefacts»)
- EU R&D Project PROSENSE («Promote, Mobilize, Reinforce and Integrate Wireless Sensor Networking Research and Researchers: Towards Pervasive Networking of WBC and the EU»)
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