Seventh International Workshop on Data Management for Sensor Networks (DMSN’10)

September 13, 2010
Singapore

in conjunction with the
36th International Conference on Very Large Data Bases

ACM ISBN: 978-1-4503-0416-0

Editors: Demetris Zeinalipour
         Wang-Chien Lee

Sponsored by:
Foreword

It is our great pleasure to welcome you all to the 7th International Workshop on Data Management for Sensor Networks (DMSN’10), which takes place in Singapore on September 13, 2010. The annual DMSN workshop is a leading international forum that covers all important aspects of sensor data management, including data acquisition, processing, and storage in remote wireless networks; the handling of uncertain sensor data; and the management of heterogeneous and sometimes sensitive sensor data in databases. It brings together a wide range of researchers, practitioners, and users to explore and share scientific and industrial challenges that arise in the aforementioned contexts. We hope you find the workshop academically stimulating and the location interesting and enjoyable.

One of our main objectives was to bring forward an exciting research program, spanning both predominant and emerging fields in data management for sensor networks. DMSN’10 received 10 submissions for research papers, out of those we accepted only 6 papers. The accepted papers were thematically organized in the following categories: Data Provenance, Query Processing, Mobile Sensor Networks and Outlier Detection in Sensor Networks. In addition to research contributions, DMSN’10 features an exciting keynote talk by Prof. Kian-Lee Tan (National University of Singapore, Singapore), with title: “What’s NExT? Sensor + Cloud!?”. Finally, the program also features a panel discussion with title “Future Directions in Sensor Data Management: A Panel Discussion”, with panelists Dr. Yanlei Diao (University of Massachusetts Amherst, USA), Prof. Le Grueenwald (National Science Foundation, USA), Prof. Christian S. Jensen (Aarhus University) and Prof. Kian-Lee Tan (National University of Singapore, Singapore).

Besides authors that provided the content of the program, several other people have contributed to the successful organization of DMSN’10. In particular, we would like to thank our technically and geographically diverse Technical Program Committee (TPC), which enabled us to make high quality decisions. Our TPC comprised of 32 members that spanned the following continents: North America (50%), Europe (31%) and Asia (19%). Our TPC board came from both Academia (87%) and Industrial Research Labs (13%). We owe our sincere gratitude to all of these members for their excellent work in reviewing the papers and providing valuable feedback under a tight schedule. Every paper was reviewed at least by 3 TPC members. We would like to thank Microsoft for granting us permission to use the Microsoft Conference Management System (CMT) and the entire CMT support team, for their help in setting up and managing the online review process. The latest features in CMT made it extremely easy to cope with virtually all aspects of the paper evaluation process.

Our special thanks also go to the general chairs of DMSN’10 Mario Nascimento (University of Alberta, Canada) and Nesime Tatbul (ETH Zurich, Switzerland) for their frequent advice that guided us through many of the questions and concerns that arose along the way. We are also grateful to our publicity chair Olga Papaemmanouil (Brandeis University, USA) for setting up and maintaining the DMSN’10 website but also for her timely dissemination activities. Finally, we would like to thank the DMSN’10 Steering Committee: Yanlei Diao (University of Massachusetts Amherst, USA), Christian S. Jensen (Aarhus University, Denmark), Alexandros Labrinidis (University of Pittsburgh, USA), Samuel R. Madden (Massachusetts Institute of Technology, USA); and the VLDB organization, in particular the VLDB workshop chairs: Amol Deshpande (University of Maryland, USA); Zachary G. Ives (University of Pennsylvania, USA) and Anthony Kum Hoe Tung (National University of Singapore, Singapore) as well as the VLDB proceeding chairs: Yi Chen (Arizona State University, USA) and Y.C. Tay (National University of Singapore, Singapore).

Despite the economically hard times we were very fortunate to receive a sponsorship from CONET (EU’s Cooperating Objects Network Of Excellence), which deals with research in the areas of embedded systems, pervasive computing and wireless sensor networks.
Last and definitely not the least, we want to thank all authors who submitted their work to DMSN’10, our panelists and all of you participating at this great workshop.

We sincerely hope you enjoy the workshop, VLDB, and Singapore!

Demetris Zeinalipour  
DMSN’10 PC Co-Chair  
Department of Computer Science  
University of Cyprus  
CY-1678 Nicosia, Cyprus  
(dzeina@cs.ucy.ac.cy)

Wang-Chien Lee  
DMSN’10 PC Co-Chair  
Department of Computer Science and Engineering  
The Pennsylvania State University  
University Park, PA 16802, USA  
(wlee@cse.psu.edu)
DMSN 2010 Workshop Organization

General Chairs: Mario A. Nascimento (University of Alberta, Canada)  
Nesime Tatbul (ETH Zurich, Switzerland)

Program Committee Chairs: Wang-Chien Lee (Pennsylvania State University, USA)  
Demetris Zeinalipour (University of Cyprus, Cyprus)

Steering Committee: Yanlei Diao (University of Massachusetts Amherst, USA)  
Christian S. Jensen (Aarhus University, Denmark)  
Alexandros Labrinidis (University of Pittsburgh, USA)  
Samuel R. Madden (Massachusetts Institute of Technology, USA)

Program Committee: Karl Aberer (EPF Lausanne, Switzerland)  
Magdalena Balazinska (University of Washington, USA)  
Erik Buchmann (Karlsruhe Institute of Technology, Germany)  
Ugur Cetintemel (Brown University, USA)  
Lei Chen (Hong Kong University of Science and Technology, Hong Kong)  
Panos K. Chrysanthis (University of Pittsburgh, USA)  
Yanlei Diao (University of Massachusetts Amherst, USA)  
Alvaro A.A. Fernandes (University of Manchester, UK)  
Lin Guo (Hong Kong University of Science and Technology, Hong Kong)  
Takahiro Hara (Osaka University, Japan)  
Wei Hong (Arch Rock Corporation, USA)  
Christian S. Jensen (Aarhus University, Denmark)  
Vana Kalogeraki (Athens University of Economics and Business, Greece)  
Yannis Kotidis (Athens University of Economics and Business, Greece)  
Philip Levis (Stanford University, USA)  
Samuel R. Madden (Massachusetts Institute of Technology, USA)  
Sebastian Michel (Saarland University, Germany)  
Gail Mitchell (BBN, USA)  
Mohamed Mokbel (University of Minnesota, USA)  
Rene Muller (ETH Zurich, Switzerland)  
Suman Nath (Microsoft Research Redmond, USA)  
Ioannis Nikolaidis (University of Alberta, Canada)  
Olga Papaemmanouil (Brandeis University, USA)  
Kai-Uwe Sattler (TU Ilmenau, Germany)  
Adam Silberstein (Yahoo! Research, USA)  
Kian-Lee Tan (National University of Singapore, Singapore)  
Xueyan Tang (Nanyang Technological University, Singapore)  
Nesime Tatbul (ETH Zurich, Switzerland)  
Goce Trajcevski (Northwestern University, USA)  
Matt Welsh (Harvard University, USA)  
Jianliang Xu (Hong Kong Baptist University, Hong Kong)  
Jun Yang (Duke University, USA)
Table of Contents

SESSION I: Keynote Speaker

What’s NEzT? Sensor + Cloud!? ................................................................. 1
Kian-Lee Tan (National University of Singapore, Singapore)

SESSION II: Data Provenance and Query Processing

Provenance-based Trustworthiness Assessment in Sensor Networks .................... 2
Hyo-Sang Lim (Purdue University, USA)
Yang-Sae Moon (Kangwon National University, South Korea)
Elisa Bertino (Purdue University, USA)

Facilitating Fine Grained Data Provenance using Temporal Data Model ............... 8
Mohammad R. Huq (University of Twente, Netherlands)
Andreas Wombacher (University of Twente, Netherlands)
Peter M. G. Apers (University of Twente, Netherlands)

Processing Strategies for Nested Complex Sequence Pattern Queries over Event Streams .......... 14
Mo Liu (Worcester Polytechnic Institute, USA)
Medhabi Ray (Worcester Polytechnic Institute, USA)
Elke A. Rundensteiner (Worcester Polytechnic Institute, USA)
Daniel J. Dougherty (Worcester Polytechnic Institute, USA)
Chetan Gupta (HP Labs, USA)
Song Wang (HP Labs, USA)
Ismail Ari (Ozyegin University, Turkey)
Abhay Mehta (HP Labs, USA)

SESSION III: Mobile Sensor Networks and Outlier Detection

Query Driven Data Collection and Data Forwarding in Intermittently Connected Mobile Sensor Networks ................................................................. 20
Wei Wu (National University of Singapore, Singapore)
Hock Beng Lim (Nanyang Technological University)
Kian-Lee Tan (National University of Singapore, Singapore)

DEMS: A Data Mining Based Technique to Handle Missing Data in Mobile Sensor Network Applications ................................................................. 26
Le Gruenwald (University of Oklahoma, USA)
Md. Shiblee Sadik (University of Oklahoma, USA)
Rahul Shukla (University of Oklahoma, USA)
Hanqing Yang (University of Oklahoma, USA)

Nikos Giatrakos (University of Piraeus, Greece)
Yannis Kotidis (Athens University of Economics and Business, Greece)
Antonios Deligiannakis (Technical University of Crete, Greece)

SESSION IV: Panel Discussion

Future Directions in Sensor Data Management: A Panel Discussion .................... 38
Panelists: Yanlei Diao (University of Massachusetts Amherst, USA), Le Gruenwald (National Science Foundation, USA), Christian S. Jensen (Aarhus University, Denmark), Kian-Lee Tan (National University of Singapore, Singapore)
Panel Moderator: Demetris Zeinalipour (University of Cyprus, Cyprus)