Lecture Notes of the Institute
for Computer Sciences, Social Informatics
and Telecommunications Engineering 102

Francisco Martins Luís Lopes
Hervé Paulino (Eds.)

Sensor Systems and Software

Third International ICST Conference,
S-Cube 2012
Lisbon, Portugal, June 4-5, 2012
Revised Selected Papers

Springer

Volume Editors

Francisco Martins
Universidade de Lisboa, Faculdade de Ciências & LaSIGE
Departamento de Informática
Faculdade de Ciências
Campo Grande, 1749-016 Lisboa, Portugal
E-mail: fmartins@di.fc.ul.pt

Luís Lopes
Universidade do Porto
CRACS/INESC-TEC & Faculdade de Ciências
Departamento de Ciência de Computadores
Faculdade de Ciências
Rua do Campo Alegre 1021, 4169-007 Porto, Portugal
E-mail: lblopes@dcc.fc.up.pt

Hervé Paulino
Universidade Nova de Lisboa
CITI & Departamento de Informática
Faculdade de Ciências e Tecnologia
2829-516 Caparica, Portugal
E-mail: herve@di.fct.unl.pt

ISSN 1867-8211
ISBN 978-3-642-32777-3
DOI 10.1007/978-3-642-32778-0

e-ISSN 1867-822X
e-ISBN 978-3-642-32778-0

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012944425

CR Subject Classification (1998): C.2.1, C.2, C.3, J.2, J.3, H.2.8, C.4, K.6

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

The Third International ICST Conference on Sensor Systems and Software (S-cube 2012) was held during June 4–5, in Lisbon, Portugal. The conference focuses on the research challenges arising from the development of software systems for wireless sensor networks (WSNs). WSNs introduce innovative and interesting application scenarios that may support a large amount of different applications including environmental monitoring, disaster prevention, building automation, object tracking, nuclear reactor control, fire detection, agriculture, healthcare, and traffic monitoring. The widespread acceptance of these new services can be improved by the development of novel programming paradigms, middleware, and technologies that have the potential to radically simplify the development and deployment of WSN applications. Such improvements require contributions from many fields of expertise such as embedded systems, distributed systems, data management, system security, and machine learning. The emphasis is, thus, on layers well above the traditional MAC, routing, and transport layer protocols.

This year's technical program included four invited talks/papers, seven regular papers, and three demos. Overall we received 18 submissions corresponding to an acceptance rate of 38%. The papers make quite diverse contributions with an emphasis on: middleware, frameworks, learning from sensor data streams, stock management, e-health, and Web of Things.

There were around 25 registrants for the conference. The social program included a dinner at "A Severa," a picturesque restaurant in downtown Lisbon, where the attendees had the opportunity to listen to "fado," a music style that is characterstic of Portugal and that has recently been classified as part of the World Cultural Heritage.

Conference Organization

Steering Committee

Imrich Chlamtac	Create-Net, Italy
Sabrina Sicari	Università degli studi dell'Insubria, Italy
Stephen Hailes	University College of London, UK

Organizing Committee

Conference General Chair

Francisco Martins	University of Lisbon, Portugal

TPC Chair

Luís Lopes	University of Porto, Portugal

Local Chair

Hervé Paulino	New University of Lisbon, Portugal

Conference Coordinator

Justina Senkus	ICST

Web Chair

Ana Lúcia Rodrigues	University of Lisbon, Portugal
Rúben Quintas	University of Lisbon, Portugal

Technical Program Committee

Alberto Coen Porisini	Università degli Studi dell'Insubria, Italy
Alicia Asín Pérez	Libelium, Spain
Animesh Pathak	INRIA, France
Fausto Vieira	Instituto de Telecomunicações, Portugal
Francisco Martins	Universidade de Lisboa, Portugal
Hervé Paulino	Universidade Nova de Lisboa, Portugal
JeongGil Ko	Johns Hopkins University, USA
João Gama	Universidade do Porto, Portugal
Luís Lopes	University of Porto, Portugal
Mattia Monga	Università degli Studi di Milano, Italy

Ming Zhao	Florida International University, USA
Mirco Musolesi	University of St. Andrews, UK
Pedro Brandão	Universidade do Porto, Portugal
Pedro Pereira Rodrigues	Universidade do Porto, Portugal
Philip Morrow	University of Ulster, UK
Sabrina Sicari	Universitá degli Studi dell'Insubria, Italy
Traian Abrudan	Instituto de Telecomunicações, Portugal
Ming Zhao	Florida International University, USA

Table of Contents

Day One

Vehicular Sensing: Emergence of a Massive Urban Scanner 1
Michel Ferreira, Ricardo Fernandes, Hugo Conceição, Pedro Gomes, Pedro M. d'Orey, Luís Moreira-Matias, João Gama, Fernanda Lima, and Luís Damas

Framework for a Self-managed Wireless Sensor Cloud for Critical Event Management 15
Nithya G. Nair, Philip J. Morrow, and Gerard P. Parr

Middleware Mechanisms for Agent Mobility in Wireless Sensor and Actuator Networks 30
Nikos Tziritas, Giorgis Georgakoudis, Spyros Lalis, Tomasz Paczesny, Jarosław Domaszewicz, Petros Lampsas, and Thanasis Loukopoulos

Vital Responder – Wearable Sensing Challenges in Uncontrolled Critical Environments 45
Miguel Coimbra and João Paulo Silva Cunha

Time Series Prediction for Energy-Efficient Wireless Sensors: Applications to Environmental Monitoring and Video Games 63
Yann-Aël Le Borgne and Gianluca Bontempi

Day Two

Connected Cars: How Distributed Data Mining Is Changing the Next Generation of Vehicle Telematics Products 73
Hillol Kargupta

Modelling and Simulation of Underwater Low-Power Wake-Up Systems 75
Salvador Climent, Antonio Sanchez, Juan Vicente Capella, Sara Blanc, and Juan José Serrano

Collaborative Sensing Platform for Eco Routing and Environmental Monitoring 89
Markus Duchon, Kevin Wiesner, Alexander Müller, and Claudia Linnhoff-Popien

Integrate WSN to the Web of Things by Using XMPP 105
Pin Nie and Jukka K. Nurminen

Challenges and Opportunities for Embedded Computing in Retail Environments 121
Kunal Mankodiya, Rajeev Gandhi, and Priya Narasimhan

The Need for Standardized Tests to Evaluate the Reliability of Data Transport in Wireless Medical Systems 137
Helena Fernandez-Lopez, José A. Afonso, J.H. Correia, and Ricardo Simoes

Link Stability in a Wireless Sensor Network – An Experimental Study 146
Stefan Lohs, Reinhardt Karnapke, and Jörg Nolte

Author Index 163