

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

76

Editorial Board

Ozgur Akan

Middle East Technical University, Ankara, Turkey

Paolo Bellavista

University of Bologna, Italy

Jiannong Cao

Hong Kong Polytechnic University, Hong Kong

Falko Dressler

University of Erlangen, Germany

Domenico Ferrari

Università Cattolica Piacenza, Italy

Mario Gerla

UCLA, USA

Hisashi Kobayashi

Princeton University, USA

Sergio Palazzo

University of Catania, Italy

Sartaj Sahni

University of Florida, USA

Xuemin (Sherman) Shen

University of Waterloo, Canada

Mircea Stan

University of Virginia, USA

Jia Xiaohua

City University of Hong Kong, Hong Kong

Albert Zomaya

University of Sydney, Australia

Geoffrey Coulson

Lancaster University, UK

Martin Griss Guang Yang (Eds.)

Mobile Computing, Applications, and Services

Second International ICST Conference, MobiCASE 2010
Santa Clara, CA, USA, October 25–28, 2010
Revised Selected Papers

Volume Editors

Martin Griss
Carnegie Mellon University
Silicon Valley, Bldg. 23
Moffett Field, CA 94035, USA
E-mail: martin.gris@sv.cmu.edu

Guang Yang
Nokia Research Center
955 Page Mill Rd
Palo Alto, CA 94304, USA
E-mail: guang.g.yang@nokia.com

ISSN 1867-8211
ISBN 978-3-642-29335-1
DOI 10.1007/978-3-642-29336-8

e-ISSN 1867-822X
e-ISBN 978-3-642-29336-8

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012934858

CR Subject Classification (1998): C.2, H.4, I.2, D.2, H.3, H.5

© ICST Institute for Computer Science, Social Informatics and Telecommunications Engineering 2012

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

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

Welcome to the proceedings of MobiCASE 2010, the Second International Conference on Mobile Computing, Applications, and Services, held in the heart of the Silicon Valley. Built on last year's inaugural success, MobiCASE provided great opportunities to researchers and practitioners, both from academia and industry, to present and discuss their work on mobile applications and service provisioning.

We were thrilled to have a very strong program this year. Philippe Lucas, Senior Vice President of France Telecom Orange, Marc Davis, Partner Architect of Microsoft Online Services Division, and Arpit Joshipura, Vice President of Ericsson Silicon Valley, delivered morning keynote speeches. Tony Wasserman, Professor at Carnegie Mellon University, and Adam Blum, CEO of Rhomobile, were invited to talk in the afternoons. Panelists explored a variety of topics at three discussion sessions, including one sponsored by Wireless Communications Alliance, and we teamed up with Ericsson Silicon Valley and Sprint Developer Conference for joint exhibit sessions in the evenings.

The program was single-track with six regular sessions, covering a wide range of topics including Web and mash-ups, software engineering and development tools, cross-layer approaches, location-based services, healthcare, and social networking. Each submission went through a rigorous evaluation process with at least two independent reviews from the TPC, after which a total of 15 papers were selected for publication. All submissions and reviews were read by the TPC Chair to insure quality. The program also had a demonstration/poster session to allow better interactivity and hands-on experiences among attendees.

The conference could not be held without the tremendous work done by the Technical Program Committee (TPC). Each TPC member reviewed an average of five papers and provided in-depth critique and analysis. Special thanks go out to the General Chair, Martin Griss, for his unyielding efforts in putting together the conference. Additional thanks go to Christian Martin for working on industry submissions, Wendy Fong and KRS Murthy for handling publicity and communications, Yingen Xiong and Djamal Zeghlache for chairing workshops, Angela Nicoara for managing demonstrations and posters, and Stacy Marshall for taking care of local arrangements. Yet more thanks go to the IEEE Computer Society and CREATE-NET for their technical co-sponsorships.

Finally, my particular thanks and appreciation must be put forth for the MobiCASE Steering Committee Chair, Imrich Chlamtac, and committee members Thomas Phan and Petros Zerfos, whose vision has steered and shaped this effort.

Guang Yang

Organization

Steering Committee

Imrich Chlamtac	CREATE-NET, Italy
Thomas Phan	Microsoft
Petros Zerfos	IBM Research

Organizing Committee

Martin Griss	Carnegie Mellon Silicon Valley, USA
Imrich Chlamtac	CREATE-NET, Italy
Guang Yang	Nokia Research Center, USA
Christian Martin	Institut Telecom, France
Angela Nicoara	Deutsche Telekom Inc. R&D Lab, USA
David Kagan	Kagan Media Net, USA
Yingen Xiong	Nokia Research Center, USA
Djamal Zeghlache	Institut Telecom, France
Wendy Fong	Carnegie Mellon Silicon Valley, USA
KRS Murthy	I Cubed, USA
Stacy Marshall	Carnegie Mellon Silicon Valley, USA

Technical Program Committee

Paolo Bellavista	University of Bologna, Italy
Nina Bhatti	HP Labs, USA
Jeff Burke	UCLA, USA
Ling-Jyh Cheng	Academica Sinica, Taiwan
Jerry Cheng	Yahoo!, USA
Angela Dalton	Johns Hopkins University, USA
Anind Dey	Carnegie Mellon University, USA
Hanni Jamjoom	IBM Research, USA
Lukas Kencl	Czech Technical University, Czech Republic
Satya Mallya	Orange Labs, USA
Gerard Memmi	Institut Telecom, France
Tommi Mikkonen	Tampere University, Finland
April Mitchell	HP Labs, USA
Rebecca Montanari	University of Bologna, Italy
Thomas Phan	Microsoft, USA
Calicrates Policroniades	Telenor, Norway

Michel Simatic	Telecom & Management SudParis, France
Martin Svensson	Ericsson Research, USA
Pablo Vidales	Deutsche Telekom Labs, Germany
Yingen Xiong	Nokia Research Center, USA
Djamal Zeghlache	Institut Telecom, France
Petros Zerfos	IBM Research, USA
Yu Zheng	Microsoft Research, China

Workshop Committees

International Workshop on Mobile Security 2010

Philippe Proust	Security labs, Gemalto
Patrick Tague	Carnegie Mellon University, USA
Yafei Yang	Qualcomm
Lujo Bauer	Carnegie Mellon University, USA
Hao Chen	University of California - Davis, USA
Songqing Chen	George Mason University, USA
Yuecel Karabulut	SAP
Angelos Keromytis	Columbia University, USA
Sridhar Machiraju	Google
Patrick Traynor	Georgia Institute of Technology, USA
Zheng Yan	Nokia Research Center

International Workshop on Mobile Computing and Clouds 2010

Calton Pu	Georgia Institute of Technology, USA
Weidong (Larry) Shi	Nokia Research Center, Palo Alto, USA
Sujoy Basu	HP Lab, Palo Alto, USA
Ivona Brandic	Vienna University of Technology, Austria
Rajkumar Buyya	University of Melbourne, Australia
Keke Chen	Wright State University, USA
Wenguang Chen	Tsinghua University, China
Byung-Gon Chun	Intel Labs, Berkeley, USA
Frdric Desprez	INRIA, France
Guofei Gu	Texas A&M University, USA
Zhu Li	Hong Kong Polytechnic University, Hong Kong
Shivajit Mohapatra	Motorola Applied Research Center, USA
Nitya Narasimhan	Motorola Applied Research Center, USA
Guillaume Pierre	VU University, The Netherlands
Kyung Dong Ryu	IBM T.J. Watson Research Center, USA
Weisong Shi	Wayne State University, USA
Dilma Da Silva	IBM T.J. Watson Research Center, USA
Sivasubramanian Swami	Amazon Inc, USA
Zhenlin Wang	Michigan Technological University, USA

Shouhuai Xu	University of Texas at San Antonio, USA
Jun Yang	Nokia Research Center, Palo Alto, USA
Sheng Zhong	State University of New York (SUNY) at Buffalo, USA
Dong Zhou	NTT DoCoMo Research Lab, Palo Alto, USA
Suiping Zhou	Nanyang Technological University, Singapore

Workshop on Mobile Software Engineering 2010

Sarah Allen	Blazing Cloud
Ray Bareiss	Carnegie Mellon Silicon Valley, USA
Adam Blum	Rhomobile
David Brittain	Motorola
Martin Griss	Carnegie Mellon Silicon Valley, USA
David Witkowski	Wireless Communications Alliance

Table of Contents

Mobile Web and Mashups

3D Audio Interface for Rich Mobile Web Experiences	1
<i>Victor K.Y. Wu and Roy H. Campbell</i>	
Secure, Consumer-Friendly Web Authentication and Payments with a Phone	17
<i>Ben Dodson, Debangsu Sengupta, Dan Boneh, and Monica S. Lam</i>	
Tool Support for Constructing Mobile Mashups	39
<i>Lasse Holmstedt, Tommi Mikkonen, and Mikko Terho</i>	

Software Engineering and Development Tools

Cuckoo: A Computation Offloading Framework for Smartphones	59
<i>Roelof Kemp, Nicholas Palmer, Thilo Kielmann, and Henri Bal</i>	
Debugging Tools for MIDP Java Devices	80
<i>Olli Kallioinen and Tommi Mikkonen</i>	
Dynamic Reduction of Rollbacks in Wireless Multi-user Virtual Environments	100
<i>Abdul Malik Khan, Sophie Chabridon, and Antoine Beugnard</i>	

Cross-Layer Approaches

Handling the M in MANet: An Algorithm to Identify Stable Groups of Peers Using Cross-Layering Information	117
<i>Hoa Dung Ha Duong and Isabelle Demeure</i>	
Small World VoIP	137
<i>Xiaohui Yang, Angelos Stavrou, Ram Dantu, and Duminda Wijesekera</i>	

Location-Based Services

When Will You Be at the Office? Predicting Future Locations and Times	156
<i>Ingrid Burbey and Thomas L. Martin</i>	
PosQ: Unsupervised Fingerprinting and Visualization of GPS Positioning Quality	176
<i>Mikkel Baun Kjærgaard and Kay Weckemann</i>	

SensOrchestra: Collaborative Sensing for Symbolic Location Recognition	195
<i>Heng-Tze Cheng, Feng-Tso Sun, Senaka Buthpitiya, and Martin Griss</i>	

Mobile Healthcare

Activity-Aware Mental Stress Detection Using Physiological Sensors	211
<i>Feng-Tso Sun, Cynthia Kuo, Heng-Tze Cheng, Senaka Buthpitiya, Patricia Collins, and Martin Griss</i>	
Dr. Droid: Assisting Stroke Rehabilitation Using Mobile Phones	231
<i>Andrew Goodney, Jinho Jung, Scott Needham, and Sameera Poduri</i>	

Mobile Social Networking

Open Transaction Network: Connecting Communities of Experience through Mobile Transactions	243
<i>Kwan Hong Lee, Dawei Shen, Andrew Lippman, and Erik Ross</i>	
Mobile Lifelogger – Recording, Indexing, and Understanding a Mobile User’s Life	263
<i>Snehal Chennuru, Peng-Wen Chen, Jiang Zhu, and Joy Ying Zhang</i>	

Demos and Posters

Activity-Aware Mental Stress Detection Using Physiological Sensors	282
<i>Feng-Tso Sun, Cynthia Kuo, Heng-Tze Cheng, Senaka Buthpitiya, Patricia Collins, and Martin Griss</i>	
A Decentralized Decision Support System for Mobile Devices	302
<i>Gert Scholten, Nicholas Palmer, Roelof Kemp, Thilo Kielmann, and Henri Bal</i>	
Inferring Complex Human Behavior Using a Non-obtrusive Mobile Sensing Platform.....	306
<i>Bruce DeBruhl, Michele Cossalter, Roy Want, Ole Mengshoel, and Pei Zhang</i>	
Magic Wand: A Framework for Developing Remote Controlled Web Applications.....	311
<i>Vibhor Nanavati</i>	

International Workshop on Mobile Computing and Clouds

Bringing the Cloud Down to Earth: Transient PCs Everywhere	315
<i>Mahadev Satyanarayanan, Stephen Smaldone, Benjamin Gilbert, Jan Harkes, and Liviu Iftode</i>	
VStore++: Virtual Storage Services for Mobile Devices	323
<i>Sudarsun Kannan, Karishma Babu, Ada Gavrilovska, and Karsten Schwan</i>	
On Economic Mobile Cloud Computing Model	329
<i>Hongbin Liang, Dijiang Huang, and Daiyuan Peng</i>	
The Smartphone and the Cloud: Power to the User	342
<i>Roelof Kemp, Nicholas Palmer, Thilo Kielmann, and Henri Bal</i>	
Towards Cloud Mobile Hybrid Application Generation Using Semantically Enriched Domain Specific Languages	349
<i>Ajith Ranabahu, Amit Sheth, Ashwin Manjunatha, and Krishnaprasad Thirunarayan</i>	
Augmenting Pervasive Environments with an XMPP-Based Mobile Cloud Middleware	361
<i>Dejan Kovachev, Yiwei Cao, and Ralf Klamma</i>	
Elastic HTML5: Workload Offloading Using Cloud-Based Web Workers and Storages for Mobile Devices	373
<i>Xinwen Zhang, Won Jeon, Simon Gibbs, and Anugeetha Kunjithapatham</i>	

International Workshop on Mobile Security 2010

Cost-Sensitive Detection of Malicious Applications in Mobile Devices . . .	382
<i>Yael Weiss, Yuval Fledel, Yuval Elovici, and Lior Rokach</i>	
On-line Signature Verification on a Mobile Platform	396
<i>Nesma Houmani, Sonia Garcia-Salicetti, Bernadette Dorizzi, and Mounim El-Yacoubi</i>	
Google Android: An Updated Security Review	401
<i>Yuval Fledel, Asaf Shabtai, Dennis Potashnik, and Yuval Elovici</i>	
SAVED: Secure Android Value addedED services	415
<i>Antonio Grillo, Alessandro Lentini, Vittorio Ottaviani, Giuseppe F. Italiano, and Fabrizio Battisti</i>	
Author Index	429