2013 IEEE 10th International Conference on Ubiquitous Intelligence and Computing and 2013 IEEE 10th International Conference on Autonomic and Trusted Computing

(UIC/ATC 2013)

Sorrento Peninsula, Italy
18-21 December 2013
Table of Contents

Message from the UIC-13 Organizing Committee ................................................................. xiii
UIC 2013 Organizing and Program Committee ................................................................. xv
Message from the ATC-13 Organizing Committee .............................................................. xix
ATC 2013 Organizing and Program Committee ................................................................. xx
Message from the UIAS-13 Organizing Committee ........................................................... xxiii
Message from the ITUS-13 Organizing Committee ........................................................... xxiv
Keynote Speakers ................................................................................................................ xxv

The 10th IEEE International Conference on Ubiquitous Intelligence and Computing (UIC’10)

UIC 1: Localization and Location-Based Services

Hybrid Localization for Ubiquitous Services ........................................................................ 1

Massimo Ficco and Rocco Aversa

DE2: Localization with the Rotating RSS Using a Single Beacon ........................................ 9

Liqing Ren, Xiaojiang Chen, Junjie Huang, Tianzhang Xing, Weike Nie, Chen Liu, and Dingyi Fang

User Travelling Pattern Prediction via Indistinct Cellular Data Mining .............................. 17

Jingwei Wang, Neil Y. Yen, Bin Guo, Runhe Huang, Jianhua Ma, Tao Ban, and Hong Zhao

BodyGuards: A Clairvoyant Location Predictor Using Frequent Neighbors and Markov Model ................................................................. 25

Roland Assam and Thomas Seidl

Privacy Preserving Path Recommendation for Moving User on Location Based Service ................................................................. 33

Yuqing Sun, Haoran Xu, and Reynold Cheng

Constructing Adaptive Indoor Radio Maps for Dynamic Wireless Environments ............... 41

Xiaodong Cai, Ling Chen, and Gencai Chen
UIC 2: Mobile and Ubiquitous Systems

Android Platform Based on Vehicle Embedded Data Stream Processing .................................................................48
    Yukikazu Nakamoto, Masanori Okamoto, Mohammed Bhuiya, Akihiro Yamaguchi, Kenya Sato,
    Shinya Honda, and Hiroaki Takada

Exploring a New Dimension in Code Mobility for Ubiquitous Embedded Systems ...............................................................56
    Alessandro Cilardo, Nicola Mazzocca, and Paolo Prinetto

PathSim: A Tool for Finding Minimal Energy Device Operation Sequence for Reaching a Target Context in a Smart-Home .................................................................64
    Teruhiro Mizumoto, Khaled El-Fakih, and Keiichi Yasumoto

Using Virtualization and Guacamole/VNC to Provide Adaptive User Interfaces to Disabled People in Cloud Computing .................................................................72
    Davide Mulfari, Antonio Celesti, Massimo Villari, and Antonio Puliafito

Towards Physical Activity Recognition Using Smartphone Sensors ..................................................................................80
    Muhammad Shoaib, Hans Scholten, and P.J.M. Havinga

uOS: A Resource Rerouting Middleware for Ubiquitous Games ..................................................................................88
    Fabricio N. Buzeto, Miriam A.M. Capretz, Carla D. Castanho, and Ricardo P. Jacobi

UIC 3: Mobile Social Networking and Crowd Sensing (1)

Fully Distributed Self Certified Key Management for Large-Scale MANETs ........................................................................96
    Zahra Moradlu, Mohammad Ali Doostari, Mohammed Gharib, and Ali Movaghar

Social Activity Recognition and Recommendation Based on Mobile Sound Sensing .........................................................103
    Yao Yang, Bin Guo, Zhiwen Yu, and Huilei He

Tagpref: User Preference Modeling by Social Tagging .................................................................................................111
    Wei Hu, Yaoxue Zhang, Yuezhi Zhou, and Kun Deng

Integrating Things and the Smart Mobile Phone Capabilities through the Wireless Web of Things .........................................................119
    L.M. Domínguez-Peinado and M. Linaje

Understand Group Travel Behaviors in an Urban Area Using Mobility Pattern Mining .........................................................127
    Bowen Du, Yang Yang, and Weifeng Lv

UIC 4: Mobile Social Networking and Crowd Sensing (2)

Socially-Aware Venue Recommendation for Conference Participants .............................................................................134
    Feng Xia, Nana Yaw Asabere, Joel J.P.C. Rodrigues, Filippo Basso, Nakema Deonauth, and Wei Wang

Using the Model of Markets with Intermediaries as an Incentive Scheme for Opportunistic Social Networks .................................................................142
    Shenlong Huangfu, Bin Guo, Zhiwen Yu, and Dongsheng Li

A Mobile Social Network-Based Group Touring Scheme with FEC Packet Loss Recovery .................................................150
    Chung-Ming Huang, Chao-Hsien Lee, Hsin-Yi Lai, and Chia-Ching Yang
Where is the Largest Market: Ranking Areas by Popularity from Location Based Social Networks
Zhiyong Yu, Daqing Zhang, and Dingqi Yang

An Automatic Face Annotation System Featuring High Accuracy for Online Social Networks
Chih-An Hsu, Ming-Kai Jiau, and Shih-Chia Huang

Relationship between Physical Behaviors of Students and Their Scholastic Performance
Jun-Ichiro Watanabe, Kazuo Yano, and Saki Matsuda

**UIC 5: Ubiquitous Intelligence**

Private Map Matching: Realistic Private Route Cognition on Road Networks
Roland Assam and Thomas Seidl

FCT4U—When Private Mobile Displays Meet Public Situated Displays to Enhance the User Experience
Pedro Albuquerque Santos, Rui Neves Madeira, and Nuno Correia

Improving Thermal Comfort in Residential Buildings Using Artificial Immune System
Jiawei Zhu, Fabrice Lauri, Abderraafian Koukam, Vincent Hilaire, and Marcelo Godoy Simões

RoRo-LT: Social Routing with Next-Place Prediction from Self-Assessment of Spatiotemporal Routines
Okan Türk, Hans Scholten, and Paul Havinga

The Case for Mobile Edge-Clouds
Utsav Drolia, Rolando Martins, Jiaqi Tan, Ankit Chheda, Monil Sanghavi, Rajeev Gandhi, and Priya Narasimhan

**UIC 6: Intelligent Devices and Smart Environments**

Endless Flyer: A Continuous Flying Drone with Automatic Battery Replacement
Katsuya Fujii, Keita Higuchi, and Jun Rekimoto

WeCare: An Intelligent Badge for Elderly Danger Detection and Alert
Hongwei Xie, Xianping Tao, Haibo Ye, and Jian Lu

An Intelligent Monitoring System for Cognitive Impaired People
Antonio Coronato and Giovanni Paragliola

Combining Activity Recognition and AI Planning for Energy-Saving Offices
Ilche Georgievski, Tuan Anh Nguyen, and Marco Aiello

Dynamicity to Save Energy in Microrobots Reconfiguration
Hicham Lakhlef, Hakim Mabed, and Julien Bourgeois

A Control and Decision System for Smart Buildings
Claudio Farias, Luci Pirmez, Flávia C. Delicato, Henrique Soares, Igor L. dos Santos, and Luiz F.R.C. Carmo
**UIC 7: Context-Aware Computing**

The Right Thing to Do: Automating Support for Assisted Living with Dynamic Decision Networks .........................................................................................................................................................................................262

*Nayyab Zia Naqvi, Davy Preuveneers, Wannes Meert, and Yolande Berbers*

A Loosely Coupled and Distributed Bayesian Framework for Multi-context Recognition in Dynamic Ubiquitous Environments ............................................................................................................................................270

*Arun Kishore Ramakrishnan, Davy Preuveneers, and Yolande Berbers*

An Ontology-Based Model for Context Information Management in Smart Spaces ...........................................................278

*Ana H.O.R. Castillo, Fabricio N. Buzeto, Carla D. Castanho, and Ricardo P. Jacobi*

Context-Driven Control Algorithms for Scalable Simulation of Human Activities in Smart Homes ..............................................................................................................................................................................................285

*Jae Woong Lee, Abdelsalam Helal, Yunsick Sung, and Kyungeun Cho*

Dynamic Parameter Filling for Semantic Exceptions in Context-Aware Systems ........................................................................................................................301

*Eun-Sun Cho, Joong-Hyun Choi, and Sumi Helal*

STRIPS Planning with Modular Behavior Selection Networks for Smart Home Agents ..........................................................................................................................................................................................301

*Kyon-Mo Yang and Sung-Bea Cho*

---

**UIC 8: Ubiquitous Intelligence: The Future (Invited Session)**

Eye-Tracking Experiment Design for Extraction of Viewing Patterns in Social Media ........................................................................................................................................................................................................308

*Guangyu Piao, Qun Jin, Xiaokang Zhou, Shoji Nishimura, Kanoksak Watanachote, Timothy K. Shih, and Neil Y. Yen*

Developing Social Applications in SAPERE ........................................................................................................................................................................................................................................................................314

*G. Castelli, M. Mamei, A. Rosi, and F. Zambonelli*

A Linked Data Approach to Electromagnetic Pollution Monitoring ....................................................................................................................................................................................................................................................321

*A. Esposito, L. Tarricone, and M. Zappatore*

Supporting Personizable Virtual Internet of Things ........................................................................................................................................................................................................................................................................329

*Jia Zhang, Zhipeng Li, Oscar Sandoval, Norman Xin, Yuan Ren, Rodney A. Martin, Bob Iannucci, Martin Griss, Steven Rosenberg, Jordan Cao, and Anthony Rowe*

---

**The 10th IEEE International Conference on Autonomic and Trusted Computing (IEEE ATC 2013)**

**ATC 1: Security, Privacy, and SLA Monitoring**

A Logic Framework for Flexible and Security-Aware Service Composition .....................................................................................................................................................................................................................................................337

*Massimiliano Albanese, Sushil Jajodia, and Cristian Molinaro*

Can We Trust This User? Predicting Insider’s Attitude via YouTube Usage Profiling ........................................................................................................................................................................................................................................................................347

*Miltiadis Kandias, Vasilis Sandoval, Nick Bozovic, Lilian Mitrou, and Dimitris Gritzalis*

It’s All in the Cloud: Reviewing Cloud Security ........................................................................................................................................................................................................................................................................355

*Nikolaos Pitropakis, Eleni Darra, Nikos Vrakas, and Costas Lambrinoudakis*

A Model for Multi-levels SLA Monitoring in Federated Cloud Environment ........................................................................................................................................................................................................................................................................363

*Asma Al Falasi, Mohamed Adel Serhani, and Rachida Dssouli*
ATC 2: Reliability and Trustworthiness

AntiCheetah: An Autonomic Multi-round Approach for Reliable Computing ..........................................................371
  Roberto Di Pietro, Flavio Lombardi, Fabio Martinelli, and Daniele Sgandurra

Model-Driven Estimation of Distributed Vulnerability in Complex Railway Networks .................................................380
  Annarita Drago, Stefano Marrone, Nicola Mazzocca, Annarita Tedesco, and Valeria Vittorini

Ranking of Direct Trust, Confidence, and Reputation in an Abstract System with Unreliable Components ..........................................................388
  Rolf Kiefhaber, Ralf Jahr, Nizar Msadek, and Theo Ungerer

Trusted Computing vs. Advanced Persistent Threats: Can a Defender Win This Game? ...............................................396
  Nikos Virvilis, Dimitris Gritzalis, and Theodoros Apostolopoulos

ATC 3: Autonomic Systems and Behavioral Monitoring

Linguistic Abstractions for Programming and Policing Autonomic Computing Systems ..................................................404
  Andrea Margheri, Rosario Pugliese, and Francesco Tiezzi

Autonomic Agents for Real Time UAV Mission Planning .................................................................................................410
  Domenico Pascarella, Salvatore Venticinque, and Rocco Aversa

A Smart Diagnostic Model for an Autonomic Service Bus Based on a Probabilistic Reasoning Approach ..........................................................416
  Roberto Koh-Dzul, Mariano Vargas-Santiago, Codé Diop, Ernesto Exposito, and Francisco Moo-Mena

An Autonomic Trust Management Framework for Secure Dynamic Coalition Cooperation ........................................422
  Samane Abdi

Trustful Data Forwarding in Social Opportunistic Networks .............................................................................................430
  Claudia Becker, Sven Schlinga, and Stefan Fischer

Towards Efficient Collaborative Behavioural Monitoring in a System-of-Systems .............................................................438
  Nathan Shone, Qi Shi, Madjid Merabti, and Kashif Kifayat

ATC 4: Confidentiality and Security

Towards a Trusted Hadoop Storage Platform: Design Considerations of an AES Based Encryption Scheme with TPM Rooted Key Protections ..........................................................444
  Jason Cohen and Subatra Acharya

Security-Aware Scheduling of Mission Tasks under Temporal Constraints .................................................................452
  Sepideh Deliri and Massimiliano Albanese

Formal Analysis of Security Metrics with Defensive Actions ............................................................................................458
  Leanid Krautsevich, Fabio Martinelli, and Artsiom Yautsiukhin
The 2013 International Symposium on Ubiquitous Intelligence and Autonomic Systems (UIAS 2013)

UIAS 1: Augmented Reality and Smart Environments

A Browser-Based Perceptual Experiment Platform for Visual Search Study in Augmented Reality System
Dan Feng, Dongdong Weng, Weiquan Lu, Chenchen Sun, and Ellen Yi-Luen Do

A Low-Cost and Light-Weight Motion Tracking Suit
Sarvenaz Salehi, Gabriele Bleser, Norbert Schmitz, and Didier Stricker

Energy Management in the Smart Home
Aqeel H. Kazmi, Michael J. O’Grady, and Gregory M.P. O’Hare

Human Sensing Using Computer Vision for Personalized Smart Spaces
Dipak Surie, Saeed Partonia, and Helena Lindgren

ARTHE: Experiencing Projected Augmented Reality with THings of the Everyday
Antoine Ferreira, Ana M. Bernardos, Luca Bergesio, and José R. Casar

Time Machine: A Mobile Augmented Reality System for Tourism Based on Coded-Aperture Camera
Dan Feng, Dandan Meng, Yupeng Zhang, and Dongdong Weng

UIAS 2: Semantic Web and Mobile Computing

Novel Hybrid Approach to Content Recommendation Based on Predicted Profiles
Maria Teresa Andrade and Fábio Almeida

Distributed Semantic Service Discovery for MANET
Jong Chang Park, Min Seok Choi, Byoung Joon Lee, Kyung Tae Kim, and Hee Yong Youn

CrowdSMILE: A Crowdsourcing-Based Social and Mobile Integrated System for Learning by Exploration
Dennis Mohan Punjabi, Li-Ping Tung, and Bao-Shuh Paul Lin

Agents Based Monitoring of Heterogeneous Cloud Infrastructures
Rocco Aversa, Luca Tasquier, and Salvatore Venticinque

Adaptable Web Service Registry for Publishing Profile Annotation Description
Chiraz El Hog, Raouidha Ben Djamaa, and Ikram Amous

An Autonomous Fall Detection and Alerting System Based on Mobile and Ubiquitous Computing
Jian He, Chen Hu, and Yang Li

UIAS 3: Trust Computing and Computer Forensic

The Forensics Edge Management System: A Concept and Design
Edewede Oriwoh and Paul Sant

CitiSafe: Adaptive Spatial Pattern Knowledge Using Fp-Growth Algorithm for Crime Situation Recognition
Omowunmi E. Isafiade and Antoine B. Bagula
Trust-Based Context Contract Models for the Internet of Things ................................................................. 557
Samer Machara, Sophie Chabridon, and Chantal Taconet

TrustedSIM: Towards Unified Mobile Security .................................................................................................. 563
Alessandro Cilardo, Nicola Mazzocca, and Luigi Coppolino

Privacy-Preserving Trajectory Publication against Parking Point Attacks .......................................................... 569
Peipei Sui, Tianyu Wo, Zhangle Wen, and Xianxian Li

Enhancing the Security of Mobile Applications by Using TEE and (U)SIM .......................................................... 575
Zaheer Ahmad, Lishoy Francis, Tansir Ahmed, Christopher Lobodzinski, Dev Audsin, and Peng Jiang

UIAS 4: Ad-hoc and Wireless Sensor Networks

Improving Decision-Making for Fuzzy Logic-Based Routing in Wireless Sensor Networks .................................. 583
Ehsan Ahvar, Antonio M. Ortiz, and Noel Crespi

On Neuro-inspired Wireless Sensor Networks .................................................................................................. 589
Ferdinand Peper, Naoki Wakamiya, Akihumi Kasamatsu, Shukichi Tanaka, Kenji Leibnitz, Junnosuke Teramae, Katsuyuki Kasai, and Akira Otomo

Proposal and Evaluation of Attractor Selection-Based Adaptive Routing in Layered Networks ......................... 595
Erina Takeshita and Naoki Wakamiya

Support Vector Regression Technique for Multimedia Quality Control in Multicast Networks ............................ 601
Qihua Yang, Biao Jiang, Tarek Saadawi, Ahmed Abdelal, and Mitesh Patel

The Analysis of Route Availability and Route Stability in Mobile Ad-hoc Wireless Networks ................................ 607
Le The Dung and Beongku An

On Constant-Time-Identification and Privacy-Preserving RFID Protocols: Trade-Off between Time and Memory .................................................................................................................. 613
Jen-Chun Chang, Hsin-Lung Wu, and Daqiang Zhang

UIAS 5: Social Engineering

A Non-invasive and Autonomous Physical Activity Measurement System for the Elderly .................................. 619
Juan Luis Carús, Víctor Peláez, Sonia García, Miguel Ángel Fernández, Gabriel Díaz, and Eduardo Álvarez

Towards Context Consistency in a Rule-Based Activity Recognition Architecture .............................................. 625
Tuan Anh Nguyen, Viktoriya Degeler, Rosario Contarino, Alexander Lazovik, Doina Bucur, and Marco Aiello

Understanding User’s Emotional Engagement to the Contents on a Smartphone Display: Psychiatric Prospective ................................................................................................................................. 631
Kunal Mukhotiya, Vinod Sharma, Rolando Martins, Ishan Pande, Samay Jain, Neal Ryan, and Rajeev Gandhi

Using Adaptive Feedback for Promoting Awareness about Physical Activeness in Adults .................................... 638
Hamid Mukhtar and Djamel Belaïd

Smart End-to-End Infrastructural Solution for Monitoring Patients with Neurological Disorders ........................ 644
Mohamed Adel Serhani, N. Sertac Artan, and H. Jonathan Chao
Supporting Localized Interactions among Heterogeneous Smart Things with ThingWare ..................................................650
Junjun Kong, Yao Guo, Xiangqun Chen, and Weizhong Shao

The 2013 International Workshop on Intelligent Techniques for Ubiquitous Systems (ITUS 2013)

ITUS 1: Distributed Systems and Networking
A Mobile Object-Based Secret Key Distribution Scheme for Wireless Sensor Networks .......................................................656
Pardeep Kumar, Pawani Porambage, Mika Ylianttila, and Andrei Gurtov
Analysis of Threshold-Based Event Detection Algorithms for Wireless Sensor Networks by Fault Injection .................................................................662
Karima B. Hein, Leander B. Hörmann, and Reinhold Weiss
Vehicle Type Recognition in WSN Based on ITESP Algorithm .......................................................................................668
Yan Wang and Jiliu Zhou
On the Impact of Fractal Organization on the Performance of Socio-technical Systems ...................................................672
Vincenzo De Florio, Hong Sun, Jonas Buys, and Chris Blondia
Monitoring Community Clouds: The Lightweight Network Management Protocol .........................................................678
Taariq Mullins and Antoine Bagula
Automatic Face Annotation System Used Pyramid Database Architecture for Online Social Networks .................................................................685
Yu-Hsiang Jian, Ming-Kai Jiau, and Shih-Chia Huang

ITUS 2: Intelligent Environments and Ubiquitous Computing
A Run Time Executable Task Model for Ambient Intelligent Environments .................................................................691
Asma Gharsellaoui, Yacine Bellik, and Christophe Jacquet
An Energy-Efficient Context Management Framework for Ubiquitous Systems .................................................................697
Vinicius Bezerra, Misael C. Junior, Olga Valeria, Constantino D. Neto, Liliam Leal, Marcus Lemos, Carlos G. Carvalho, Jose Bringel Filho, Raimir Holanda, and Nazim Agoulmine

Author Index ........................................................................................................................................................................703