

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, Lancaster, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Zurich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbrücken, Germany

More information about this series at <http://www.springer.com/series/7409>

Wenfeng Li · Shawkat Ali
Gabriel Lodewijks · Giancarlo Fortino
Giuseppe Di Fatta · Zhouping Yin
Mukaddim Pathan · Antonio Guerrieri
Qiang Wang (Eds.)

Internet and Distributed Computing Systems

9th International Conference, IDCS 2016
Wuhan, China, September 28–30, 2016
Proceedings

Editors

Wenfeng Li
Wuhan University of Technology
Wuhan
China

Shawkat Ali
Central Queensland University
North Rockhampton, QLD
Australia

Gabriel Lodewijks
Delft University of Technology
Delft
The Netherlands

Giancarlo Fortino
University of Calabria
Rende (CS)
Italy

Giuseppe Di Fatta
University of Reading
Reading
UK

Zhouping Yin
Huazhong University of Science
and Technology
Wuhan
China

Mukaddim Pathan
CSIRO ICT
Acton
Australia

Antonio Guerrieri
ICAR-CNR
Rende (CS)
Italy

Qiang Wang
Wuhan University of Technology
Wuhan
China

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-319-45939-4 ISBN 978-3-319-45940-0 (eBook)
DOI 10.1007/978-3-319-45940-0

Library of Congress Control Number: 2016950411

LNCS Sublibrary: SL3 – Information Systems and Applications, incl. Internet/Web, and HCI

© Springer International Publishing AG 2016

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, 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.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

IDCS 2016 was the 9th annual event of the conference series dedicated to the Internet and distributed computing systems and was held in Wuhan, China. The previous eight successful conferences included IDCS 2008 in Khulna, Bangladesh; IDCS 2009 in Jeju Island, South Korea; IDCS 2010 and IDCS 2011 in Melbourne, Australia; IDCS 2012 in Wu Yi Shan, China; IDCS 2013 in Hangzhou, China; IDCS 2014 in Calabria, Italy; and IDCS 2015 in Windsor, UK.

The Internet, including widespread use of mobile and wireless devices, has grown as a ubiquitous infrastructure to support the fast development of diversified services. The advent of the Internet of Things, cyberphysical systems, and big data is creating a new technology revolution, i.e., the next generation of internet and Industry 4.0. The integration of the digital world with the physical environment makes our world more intelligent and efficient. Large-scale networked intelligent systems require higher cooperation and interoperation of heterogeneous IoT platforms.

IDCS 2016 received innovative papers on emerging models, paradigms, technologies, and novel applications related to Internet-based distributed systems, including the Internet of Things, cyber-physical systems, wireless sensor networks, next-generation collaborative systems, extreme-scale networked systems, and cloud-based big data systems. The audience included researchers, PhD students, and practitioners that have a general interest in the different aspects of the Internet and distributed computing systems with a more specific focus on practical and theoretical aspects of the cyber-physical systems built with the integration of computer networks, distributed systems, wireless sensor technology, and network applications for complex real-life problems.

IDCS 2016 received a large number of submissions from 13 different countries: 30 regular papers and 18 short papers were accepted after a careful review and selection process. The selected contributions covered cutting-edge aspects of cloud computing and the Internet of Things, sensor networks, parallel and distributed computing, advanced networking, smart cities and smart buildings, big data, and social networks, and smart logistics technology and methods.

The conference also featured six keynote presentations: “Towards Multi-layer Interoperability of IoT Platforms: the INTER-IoT approach” was given by Prof. Giancarlo Fortino, DIMES-University of Calabria, Italy; “An Application of the IoT in Belt Conveyor Systems” was given by Prof. Gabriel Lodewijks, Delft University of Technology, The Netherlands; “IoT and Big Data in Intelligent Buildings” was given by Prof. Weiming Shen, National Research Council Canada, Canada; “Security and Privacy in Social Networks” was given by Prof. Yang Xiang, Centre for Cyber Security Research, Deakin University, Australia; “Developments and Prospects of Intelligent Water Transport in China” was given by Prof. Xinpeng Yan, Wuhan University of Technology, China; and “Semantic Web Technology for Industrial Internet of Things” was given by Prof. Hai-Bin Yu, Shenyang Institute of Automation, Chinese Academy of Sciences, China.

The conference was held at the Chutian Guangdong International Hotel in Wuhan. The conference venue is immersed in the natural landscape of Donghu Lake and the historic site of the national museum, Hubei Museum.

IDCS 2016 set up a career forum for PhD and master students to provide them with the opportunity to present their project work and discuss how to develop a novelty research topic. A workshop “Smart Transportation and Logistics” proposed by Prof. Xiaoli Jiang, Delft University of Technology, The Netherlands, was accepted by the conference and 11 papers were accepted for this session.

We would like to thank Wuhan University of Technology, the Science and Technology Council of Wuhan, and University of Calabria for providing financial support to the conference and grants to PhD students from overseas countries, and for offering 2 rewards, one for the best paper and one for the best PhD student paper.

The successful organization of IDCS 2016 was possible thanks to the dedication and hard work of a number of individuals. In particular, we would like to thank Antonio Guerrieri and Qiang Wang (Publications Chair) for their commendable work for the conference publicity and proceedings. We also express our gratitude to the students at the Logistics and Robotics Lab of Wuhan University of Technology, who provided their voluntary support during the conference.

September 2016

Wenfeng Li
Shawkat Ali
Gabriel Lodewijks
Giancarlo Fortino
Giuseppe Di Fatta
Zhouping Yin
Mukaddim Pathan
Antonio Guerrieri
Qiang Wang

Organization

Honorary Conference Chairs

Youlun Xiong	Huazhong University of Science and Technology, China
Desheng Jiang	Wuhan University of Technology, China
John Gray	University of Manchester, UK

General Chair

Wenfeng Li	Wuhan University of Technology, China
------------	---------------------------------------

Conference Chairs

Shawkat Ali	University of Fiji, Fiji
Gabriel Lodewijks	Delft University of Technology, The Netherlands
Giancarlo Fortino	University of Calabria, Italy
Giuseppe Di Fatta	University of Reading, UK
Zhouping Yin	Huazhong University of Science and Technology, China
Mukaddim Pathan	Telstra Corporation Limited, Australia

Technical Program Chairs

Deming Liu	Huazhong University of Science and Technology, China
Fazhi He	Wuhan University, China
Chaozhong Wu	Wuhan University of Technology, China
Shengwu Xiong	Wuhan University of Technology, China

PhD Workshop Chair

Mengchu Zhou	New Jersey Institute of Technology, USA
--------------	---

Publicity and Industry Chair

Christian Vecchiola	IBM Research and Development, Australia
---------------------	---

Publications Chairs

Antonio Guerrieri	ICAR-CNR, Italy
Qiang Wang	Wuhan University of Technology, China

Steering Committee - IDCS Series

Jemal Abawajy	Deakin University, Australia
Rajkumar Buyya	University of Melbourne, Australia
Giancarlo Fortino	University of Calabria, Italy
Dimitrios Georgakopoulos	RMIT University, Australia
Mukaddim Pathan	Telstra Corporation Limited, Australia
Yang Xiang	Deakin University, Australia

Program Committee

Shawkat Ali	University of Fiji, Fiji
Gianluca Aloï	University of Calabria, Italy
Rajkumar Buyya	The University of Melbourne, Australia
Mert Bal	Miami University, USA
Jingjing Cao	Wuhan University of Technology, China
Xiaojiang Chen	Northwest University, China
Min Chen	Huazhong University of Science and Technology, China
Massimo Cossentino	National Research Council, Italy
Zhicheng Dai	Huazhong Normal University, China
Marcos Dias De Assuncao	Inria Avalon, LIP, ENS de Lyon, France
Claudio De Farias	PPGI-IM/NCE-UFRJ, Brazil
Jerker Delsing	Lulea University of Technology, Sweden
Giuseppe Di Fatta	University of Reading, UK
Sisi Duan	Oak Ridge National Laboratory, USA
Declan Delaney	University College Dublin, Dublin
Giancarlo Fortino	University of Calabria, Italy
Xiuwen Fu	Wuhan University of Technology, China
Joaquin Garcia-Alfaro	T������ SudParis, France
Antonio Guerrieri	ICAR-CNR, Italy
Maria Ganzha	University of Gda��sk, Poland
Luca Geretti	University of Udine - DIEGM, Italy
Chryssis Georgiou	University of Cyprus, Cyprus
Raffaele Gravina	University of Calabria, Italy
John Gray	University of Manchester, UK
Bin Guo	T������ SudParis, France
Dimitrios Georgakopoulos	University of Thessaly, Greece
Mohammad Mehedi Hassan	King Saud University, Saudi Arabia
Fazhi He	Wuhan University, China

Xiaoya Hu	Huazhong University of Science and Technology, China
Jaehoon Paul Jeong	Sungkyunkwan University, South Korea
Desheng Jiang	Wuhan University of Technology, China
Xiaoli Jiang	Delft University of Technology, The Netherlands
Ram Krishnan	University of Texas, USA
Dimitrios Katsaros	RMIT University, Australia
Qi Kang	Tongji University, China
Wenfeng Li	Wuhan University of Technology, China
Bin Li	Fujian University of Technology, Fuzhou, China
Xiaolei Liang	Wuhan University of Science and Technology, China
Valeria Loscri	Inria Lille-Nord Europe, France
Antonio Liotta	Eindhoven University of Technology, The Netherlands
Dengming Liu	Huazhong University of Science and Technology, China
Bin Lei	Wuhan University of Science and Technology, China
Gabriel Lodewijks	Delft University of Technology, The Netherlands
Jie Mei	Wuhan University of Technology, China
Kashif Munir	UOHB, Saudi Arabia
Carlo Mastroianni	ICAR-CNR, Italy
Mustafa Mat Deris	UTHM, Malaysia
Marco Netto	IBM Research, Brazil
Enrico Natalizio	Université de Technologie de Compiègne, France
Andrea Omicini	Alma Mater Studiorum–Università di Bologna, Italy
Sergio Ochoa	Universidad de Chile, Chile
George Pallis	University of Cyprus, Cyprus
Mukaddim Pathan	Telstra Corporation Limited, Australia
Marcin Paprzycki	IBS PAN and WSM, Poland
Pasquale Pace	University of Calabria, Italy
Ting Qu	Guangdong University of Technology, China
Wilma Russo	University of Calabria, Italy
Ramesh Sitaraman	University of Massachusetts, Amherst, USA
Giandomenico Spezzano	CNR-ICAR and University of Calabria, Italy
Jingtao Sun	National Institute of Informatics, Japan
Riaz Ahmed Shaikh	King Abdul Aziz University, Saudi Arabia
Corrado Santoro	University of Catania, Italy
Claudio Savaglio	Università della Calabri, Italy
Weiming Shen	National Research Council, Canada
Wenan Tan	Shanghai Second Polytechnic University, China
Parimala Thulasiram	University of Manitoba, Canada
Giorgio Terracina	Università della Calabria, Italy
Paolo Trunfio	DEIS, University of Calabria, Italy
Rainer Unland	University of Duisburg-Essen, ICB, Germany
Athanasios Vasilakos	NTUA, Greece
Andrea Vinci	ICAR-CNR, Italy
Chaozhong Wu	Wuhan University of Technology, China

Qiang Wang	Wuhan University of Technology, China
Zhelong Wang	Dalian University of Technology, China
Youlun Xiong	Huazhong University of Science and Technology, China
Shengwu Xiong	Wuhan University of Technology, China
Xin-Qing Yan	North China University of Water Resources and Electric Power, China
Xiang Yang	Deakin University, Australia
Zhouping Yin	Huazhong University of Science and Technology, China
Norihiko Yoshida	Saitama University, Japan
Mengchu Zhou	New Jersey Institute of Technology, USA
Lanbo Zheng	Wuhan University of Technology, China

Contents

Body Sensor Networks and Wearable Devices

Continuous Gesture Recognition Based on Hidden Markov Model	3
<i>Meng Yu, Gang Chen, Zilong Huang, Qiang Wang, and Yuan Chen</i>	
A New Modeling Method of Photoplethysmography Signal Based on Lognormal Basis.	12
<i>Yun Luo, Wenfeng Li, Wenbi Rao, Xiuwen Fu, Lin Yang, and Yu Zhang</i>	
A Neuro-Fuzzy System for Classifying Fatigue Degree of Wheelchair User . . .	22
<i>Xinyun Hu, Raffaele Gravina, Wenfeng Li, and Giancarlo Fortino</i>	
Detecting Novel Class for Sensor-Based Activity Recognition Using Reject Rule	34
<i>Chuhaolun Deng, Wenjing Yuan, Zhiwen Tao, and Jingjing Cao</i>	
SwimSense: Monitoring Swimming Motion Using Body Sensor Networks . . .	45
<i>Jiaxin Wang, Zhelong Wang, Fengshan Gao, and Ming Guo</i>	

Cloud Computing and Networking

SDNFV-Based Routing Service Composition Model	59
<i>Chao Bu, Xingwei Wang, Lianbo Ma, and Min Huang</i>	
Service Model Design and Application of Product Design and Component Procurement for Small and Medium Sized Concrete Mixer Manufacturers Based on Cloud Manufacturing.	72
<i>Guofu Luo, Xianglong Yang, and Jun Ma</i>	
A Novel Access Control Model for Cloud Computing	81
<i>Rajat Saxena and Somnath Dey</i>	
Agreement in Epidemic Information Dissemination	95
<i>Mosab Ayiad, Amogh Katti, and Giuseppe Di Fatta</i>	
Cloud-Based Wheelchair Assist System for Mobility Impaired Individuals . . .	107
<i>Congcong Ma, Wenfeng Li, Jingjing Cao, Raffaele Gravina, and Giancarlo Fortino</i>	

Distributed Computing and Big Data

Energy Management Policies in Distributed Residential Energy Systems	121
<i>Sisi Duan and Jingtao Sun</i>	
LUTMap: A Dynamic Heuristic Application Mapping Algorithm Based on Lookup Tables	134
<i>Thomas Canhao Xu and Ville Leppänen</i>	
Distributed Real-Time Database for the Intelligent Community	147
<i>Xian Zhang, Wenbi Rao, Xiaosong Zheng, Chunyang Rao, Congcong Ma, and Chao Zeng</i>	
Big Sensor Data: A Survey	155
<i>Yin Zhang, Wei Li, Ping Zhou, Jun Yang, and Xiaobo Shi</i>	
Predicting Telecommunication Customer Churn Using Data Mining Techniques.	167
<i>Diana AlOmari and Mohammad Mehedi Hassan</i>	
SLOSELM: Self Labeling Online Sequential Extreme Learning Machine	179
<i>Zhongtang Zhao, Li Liu, Lingling Li, and Qian Ma</i>	

Distributed Scheduling and Optimization

A Modified Genetic Algorithm for Agricultural By-products Logistics Delivery Route Planning Problem	193
<i>Guofu Luo, Dayuan Wu, Jun Ma, and Xiaoyu Wen</i>	
Multi-objective Optimization of Warehouse System Based on the Genetic Algorithm	206
<i>Ting Wu, Hao Wang, and Zhe Yuan</i>	
A Constraint Programming Based Method for Stockyard Management Problem.	214
<i>Can Wen and Lanbo Zheng</i>	
Business Process Reengineering of Road Passenger Transport Based on Unified Modeling Language Method	222
<i>Xingxing Li, Yan Chen, and Wenfeng Li</i>	
A Method Based on SNSO for Solving Slot Planning Problem of Container Vessel Bays	231
<i>Xiaolei Liang, Bin Li, Wenfeng Li, Yu Zhang, and Lin Yang</i>	

Internet of Things and Applications

Design of Distributed Logistics Vehicle Monitoring System with High Load	245
<i>Shengwu Xiong, Na Wang, Li Kuang, Pengfei Duan, and Fengjian Yu</i>	
Design and Implementation of Work-in-Process Management System Based on RFID Technology	254
<i>Wenchao Yang, Guofu Luo, and Wenfeng Li</i>	
Improved CTP Routing Protocol Based on Ant Colony Algorithm	263
<i>Guangyou Yang, Hao Chen, and Xiong Gan</i>	
Distributed Cooperative Flocking Control for Multiple Mobile Robots Based on IoT	276
<i>Qiang Wang, Aosong Li, and Tian Zhu</i>	
Logistics Vehicle Travel Preference of Interest Points Based on Speed and Accessory State	287
<i>Shengwu Xiong, Li Kuang, Pengfei Duan, and Wei Shi</i>	
Tools for Ontology Matching—Practical Considerations from INTER-IoT Perspective.	296
<i>Maria Ganzha, Marcin Paprzycki, Wiesław Pawłowski, Paweł Szmeja, Katarzyna Wasielewska, and Giancarlo Fortino</i>	
A Partition Berth Allocation Scheduler Based on Resource Utilization and Load Balancing	308
<i>Bin Li, Yu Zhang, Xiaolei Liang, and Lin Yang</i>	

Smart Networked Transportation and Logistics

Optimization Model of the Inland Bridge Navigation Hole	319
<i>Yanfeng Wang, Liwen Huang, and Yaotian Fan</i>	
Key Properties of Connectivity in Vehicle Ad-hoc Network	328
<i>Jiujun Cheng, Pengyu Qin, Mengchu Zhou, Zhenhua Huang, and Shangce Gao</i>	
An Application of the IoT in Belt Conveyor Systems	340
<i>Gabriel Lodewijks, Wenfeng Li, Yusong Pang, and Xiaoli Jiang</i>	
A Novel Adaptive Negotiation Strategy for Agricultural Supply Chain Centered on Third Party Logistics	352
<i>Wenjing Guo, Wenfeng Li, Weiming Shen, Xiaoli Jiang, and Gabriel Lodewijks</i>	

A Facility Location Problem for the Design of a Collaborative Distribution Network.	364
<i>Xin Tang, Fabien Lehuédé, and Olivier Péton</i>	
Urban Traffic Congestion Based on System Dynamics: Taking Wuhan City as an Example	372
<i>Kaikai He and Yan Chen</i>	
Sensors Deployment in Logistics System by Genetic Invasive Weed Optimization.	381
<i>YanJun Shi, Luyang Hou, Xueyan Sun, and Yaohui Pan</i>	
Development Strategy of Agriculture Product Logistic in Guizhou Province on the Transportation Network Context	393
<i>Shanmei Song, Meirong Qiu, Wenfeng Li, and Qiaoxing Li</i>	
The Development Strategies of Logistics in Chongqing City Based on the Complex Traffic Network	405
<i>Shanmei Song, Shuaijun Chen, Wenfeng Li, and Qiaoxing Li</i>	
The Performance Appraisal of Port Logistics Informationization	413
<i>Hongming Chen and Yan Chen</i>	
Synergy Development in New Energy Automobile Industry	421
<i>Zhang Yan</i>	
Wireless Sensing and Controlling Networks	
BKR-SIFT: A High-Precise Matching Algorithm.	433
<i>Jiancai Wu, Shunyan Wang, and Wenchi Sun</i>	
Moving Object Detection for Driving Assistance System Based on Improved ORB Feature Matching.	446
<i>Jun Gao and Honghui Zhu</i>	
Swarm Robots Formation Control Based on Wireless Sensor Network.	458
<i>Bin Lei and Hao Chen</i>	
Reliable Data Transmission Method for Hybrid Industrial Network Based on Mobile Object	466
<i>Ying Duan, Wenfeng Li, Xiuwen Fu, and Lin Yang</i>	
A V-BLAST-Based Cooperative MIMO Transmission Scheme for Heterogeneous Wireless Sensor Networks	477
<i>Guangyou Yang, Jun Li, and Xiong Gan</i>	

Analysis of the Intelligent Call System Based on the Emergency Rescue in China.	487
<i>Tianping Zhang, Lijie Li, Wenfeng Li, and Jie Mei</i>	
Distance Thresholds Analysis for Cooperative Beamforming in WSNs.	494
<i>Xiong Gan, Hong Lu, and Guangyou Yang</i>	
In-Transit Status Perception of Freight Containers Logistics Based on Multi-sensor Information	503
<i>Qingxia Li, Xiaohua Cao, and Huan Xu</i>	
A Sliding Window Method for Online Tracking of Spatiotemporal Event Patterns	513
<i>JunQi Zhang, ShanWen Zhu, Di Zang, and MengChu Zhou</i>	
Author Index	525