Lecture Notes in Computer Science **11226**

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, Chennai, 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

Yang Xiang · Jingtao Sun
Giancarlo Fortino · Antonio Guerrieri
Jason J. Jung (Eds.)

Internet and Distributed Computing Systems

11th International Conference, IDCS 2018
Tokyo, Japan, October 11–13, 2018
Proceedings

Springer

Editors
Yang Xiang
Swinburne University of Technology
Hawthorn, VIC, Australia

Jingtao Sun
National Institute of Informatics
Tokyo, Japan

Giancarlo Fortino
University of Calabria
Rende (CS), Italy

Antonio Guerrieri
ICAR-CNR
Rende (CS), Italy

Jason J. Jung
Chung-Ang University
Seoul, Republic of Korea

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-030-02737-7 ISBN 978-3-030-02738-4 (eBook)
https://doi.org/10.1007/978-3-030-02738-4

Library of Congress Control Number: 2018950190

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

© Springer Nature Switzerland AG 2018
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. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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

Preface

Following the previous ten successful editions of IDCS – IDCS 2008 in Khulna, Bangladesh, IDCS 2009 in Jeju Island, 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, IDCS 2015 in Windsor, UK, IDCS 2016 in Wuhan, China, IDCS 2017 in Fiji — IDCS 2018 was the 11th in the series to promote research in diverse fields related to the Internet and distributed computing systems.

Modern systems such as distributed systems, cloud computing, mobile computing, edge computing, fog computing, and cyber-physical systems have a tendency toward complexity, elasticity, dependability, and security especially when dealing with dynamic events or actions in their environments and/or Internet applications. We not only need to keep those systems running normally, but also need them to be self-adaptive to many changes. On the other hand, the development of the Internet is very rapid, and it has already entered the 5G era. The Internet as a society infrastructure and the widespread use of mobile edge, wireless wearable devices, or IoT sensors have laid the foundation for the emergence of innovative network applications and transportation and logistics. Under the influence of these most advanced technologies, human production and life are gradually changing. The academic and industrial worlds are constantly developing and innovating in areas such as mechanical learning, artificial intelligence, and media stream processing. These technologies enrich and improve not only the quality of life of modern people, but also the process of integration in many fields, the huge amount of data processing, and the integration of the digital world with the physical environment; they also contribute toward constructive development in biological, agricultural, and policy.

IDCS 2018 received papers on emerging models, paradigms, technologies, and novel applications related to cloud computing, distributed systems, Internet of Things, cyber-physical systems, wireless sensor networks, next-generation collaborative systems, extreme-scale networked systems, and self-adaptive systems.

The audience included researchers and industry practitioners who were interested in different aspects of the Internet and distributed systems, with a particular focus on practical experiences with the design and implementation of related technologies as well as their theoretical perspectives.

IDCS 2018 received a large number of submissions from which 23 regular papers were accepted after a careful review and selection process. This year's conference also featured four invited talks: (1) "Inter-Cloud Computing over Academic and Public Clouds" from Associate Professor Atsuko Takefusa, National Institute of Informatics and The Graduate University for Advanced Studies, Tokyo, Japan; (2) "Interconnecting the Edge with Software-Defined Overlay Virtual Private Networks" from Professor Renato J. Figueiredo, University of Florida, USA; (3) "Towards Opportunistic IoT Services: A Novel Paradigm for Engineering the Next-Generation IoT Systems" from Professor Giancarlo Fortino, University of Calabria, Italy; and (4) "Simultaneous

Scheduling of Routes for On-Demand Bus and Walking Passengers" from Associate Professor Naoki Shibata, Nara Institute of Science and Technology, Japan.

IDCS 2018 was held in the wonderful Hitotsubashi Hall, National Center of Sciences Building, in the center of Tokyo, Japan. The conference organization was supported by the National Institute of Informatics (Japan), Swinburne University of Technology (Australia), Western Sydney University (Australia), and the University of Calabria (Italy).

The successful organization of IDCS 2018 was possible thanks to the dedication and hard work of a number of individuals.

Specifically, we would like to thank our program chairs, Bahman Javadi (Western Sydney University, Australia), Giuseppe Di Fatta (University of Reading, UK), Lei Zhong (Toyota InfoTechnology Center, Japan), Sisi Duan (University of Maryland, Baltimore County, USA), and Markus Ullrich (University of Applied Sciences Zittau/Görlitz, Germany), our publicity and industry chairs, Antonio Guerrieri (ICAR-CNR, Italy), Mukaddim Pathan (Telstra, Australia), and Qiang Wang (Wuhan University of Technology, China), and our Web chair, Mingkang Chen (Central China Normal University, China), for their commendable work with the conference organization. We also express our gratitude to the general chair, Yang Xiang (Swinburne University of Technology, Australia), and the conference co-chairs, Jingtao Sun (National Institute of Informatics, Japan), Giancarlo Fortino (University of Calabria, Italy), and Jason J. Jung (Chung-Ang University, South Korea), for their supports of the conference.

October 2018

Yang Xiang
Jingtao Sun
Giancarlo Fortino
Antonio Guerrieri
Jason J. Jung

Organization

General Chair

Yang Xiang	Swinburne University of Technology, Australia

Co-chairs

Jingtao Sun	National Institute of Informatics, Japan
Giancarlo Fortino	University of Calabria, Italy
Jason J. Jung	Chung-Ang University, South Korea

Program Chairs

Bahman Javadi	Western Sydney University, Australia
Giuseppe Di Fatta	University of Reading, UK
Lei Zhong	Toyota InfoTechnology Center, Japan
Sisi Duan	University of Maryland, Baltimore County, USA
Markus Ullrich	University of Applied Sciences Zittau/Görlitz, Germany

PhD Workshop Chair

Kazushige Saga	National Institute of Informatics, Japan

Publicity and Industry Chairs

Antonio Guerrieri	ICAR-CNR, Italy
Mukaddim Pathan	Telstra, Australia
Qiang Wang	Wuhan University of Technology, China

Web Chair

Mingkang Chen	Central China Normal University, China

Steering Committee - IDCS Series

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

Program Committee

Abdelkarim Erradi	Qatar University, Qatar
Andrea Omicini	Università di Bologna, Italy
Andrea Vinci	ICAR-CNR, Italy
Antonio Guerrieri	ICAR-CNR, Italy
Antonio Liotta	University of Derby, UK
Bahman Javadi	Western Sydney University, Australia
Bin Guo	Institut Telecom SudParis, France
Carlo Mastroianni	ICAR-CNR, Italy
Claudio De Farias	PPGI-IM/NCE-UFRJ, Brazil
Claudio Savaglio	University of Calabria, Italy
Dimitrios Katsaros	University of Thessaly, Greece
George Pallis	University of Cyprus, Cyprus
Giancarlo Fortino	University of Calabria, Italy
Gianluca Aloi	University of Calabria, Italy
Giorgio Terracina	University of Calabria, Italy
Giuseppe Di Fatta	University of Reading, UK
Hu Xiaoya	Huazhong University of Science and Technology, China
Jason Jung	Chung-Ang University, South Korea
Jie Mei	Wuhan University of Technology, China
Lei Zhong	Toyota InfoTechnology Center, Japan
Marcin Paprzycki	IBS PAN and WSM, Poland
Markus Ullrich	University of Applied Sciences Zittau/Görlitz, Germany
Mengchu Zhou	New Jersey Institute of Technology, USA
Mukaddim Pathan	Telstra Corporation Limited, Australia
Norihiko Yoshida	Saitama University, Japan
Paolo Trunfio	University of Calabria, Italy
Pasquale Pace	University of Calabria, Italy
Raffaele Gravina	University of Calabria, Italy
Ragib Hasan	University of Alabama at Birmingham, USA
Riaz Ahmed Shaikh	King Abdul Aziz University, Saudi Arabia
Ruppa Thulasiram	University of Manitoba, Canada
Sergio Ochoa	University of Chile, Chile
Sisi Duan	University of Maryland Baltimore County, USA
Sun Jingtao	National Institute of Informatics, Japan
Valeria Loscri	Inria, France
Wenfeng Li	Wuhan University of Technology, China
Xinqing Yan	NCWU, China
Xiuwen Fu	Shanghai Maritime University, China
Yang Xiang	Swinburne University of Technology, Australia
Jingjing Cao	Wuhan Technology University, China
Bui Khac Hoai Nam	Chung-Ang University, South Korea
Zhengxue Cheng	Waseda University, Japan

Contents

Implementation of Self-adaptive Middleware for Mobile Vehicle Tracking Applications on Edge Computing 1
Jingtao Sun, Cheng Yang, Tomoya Tanjo, Kazushige Sage, and Kento Aida

Towards the Succinct Representation of *m* Out of *n* 16
Victor Parque and Tomoyuki Miyashita

Extending the Advisor Concept to Deal with Known-Ahead Transportation Tasks 27
Nick Nygren and Jörg Denzinger

A Framework for Task-Guided Virtual Machine Live Migration 40
Cho-Chin Lin and Yuan-Han Kuo

Verifiable Privacy-Preserving Payment Mechanism for Smart Grids. 52
Chun-I Fan, Yi-Fan Tseng, Jheng-Jia Huang, Yen-Hao Chen, and Hsin-Nan Kuo

Increasing Interoperability Between Heterogeneous Smart City Applications 64
Alexander Rech, Markus Pistauer, and Christian Steger

Reduced Transmission in Multi-server Coded Caching. 75
Minquan Cheng, Qiaoling Zhang, Jing Jiang, and Ruizhong Wei

Distributed Sensor Fusion for Activity Detection in Smart Buildings 87
C. Papatsimpa and J. P. M. G. Linnartz

Climbing Ranking Position via Long-Distance Backlinks 100
V. Carchiolo, M. Grassia, A. Longheu, M. Malgeri, and G. Mangioni

Financial Application on an Openstack Based Private Cloud. 109
Deepak Bajpai, Muskan Vinayak, Ruppa K. Thulasiram, and Parimala Thulasiraman

Towards Island Networks: SDN-Enabled Virtual Private Networks with Peer-to-Peer Overlay Links for Edge Computing 122
Kensworth Subratie and Renato Figueiredo

Almost-Fully Secured Fully Dynamic Group Signatures with Efficient Verifier-Local Revocation and Time-Bound Keys 134
Maharage Nisansala Sevwandi Perera and Takeshi Koshiba

Path Planning for Multi-robot Systems in Intelligent Warehouse 148
Hailong Chen, Qiang Wang, Meng Yu, Jingjing Cao, and Jingtao Sun

Dynamic Framework for Reconfiguring Computing Resources in the Inter-cloud and Its Application to Genome Analysis Workflows. 160
Tomoya Tanjo, Jingtao Sun, Kazushige Saga, Atsuko Takefusa, and Kento Aida

Game-Theoretic Approach to Self-stabilizing Minimal Independent Dominating Sets 173
Li-Hsing Yen and Guang-Hong Sun

Towards Social Signal Separation Based on Reconstruction Independent Component Analysis 185
Hoang Long Nguyen, Khac-Hoai Nam Bui, Nayoung Jo, Jason J. Jung, and David Camacho

Performance, Resilience, and Security in Moving Data from the Fog to the Cloud: The DYNAMO Transfer Framework Approach 197
Raffaele Montella, Diana Di Luccio, Sokol Kosta, Giulio Giunta, and Ian Foster

Development of a Support System to Resolve Network Troubles by Mobile Robots 209
Kohichi Ogawa and Noriaki Yoshiura

A Benchmark Model for the Creation of Compute Instance Performance Footprints 221
Markus Ullrich, Jörg Lässig, Jingtao Sun, Martin Gaedke, and Kento Aida

Developing Agent-Based Smart Objects for IoT Edge Computing: Mobile Crowdsensing Use Case 235
Teemu Leppänen, Claudio Savaglio, Lauri Lovén, Wilma Russo, Giuseppe Di Fatta, Jukka Riekki, and Giancarlo Fortino

Path Planning of Robotic Fish in Unknown Environment with Improved Reinforcement Learning Algorithm 248
Jingbo Hu, Jie Mei, Dingfang Chen, Lijie Li, and Zhengshu Cheng

Review of Swarm Intelligence Algorithms for Multi-objective Flowshop Scheduling. 258
Lijun He, Wenfeng Li, Yu Zhang, and Jingjing Cao

Exploiting Long Distance Connections to Strengthen Network Robustness . . . 270
V. Carchiolo, M. Grassia, A. Longheu, M. Malgeri, and G. Mangioni

An Online Adaptive Sampling Rate Learning Framework for Sensor-Based Human Activity Recognition 278
Zeyi Jin, Jingjing Cao, Jingtao Sun, Wenfeng Li, and Qiang Wang

A Secure Video-Based Robust and Aesthetic 2D Barcode 282
Changsheng Chen, Fengbo Lan, and Wai Ho Mow

A Migratable Container-Based Replication Management for Inter-cloud 288
Mingkang Chen and Jingtao Sun

Dilated Deep Residual Network for Post-processing in TPG Based Image Coding 293
Yuan Yuan, Jingtao Sun, and Miaohui Wang

Underground Intelligent Logistic System Integrated with Internet of Things 298
Qiang Yang, Guohao Li, Ting Cai, and Qiang Wang

Author Index 303