

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board Members

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

More information about this series at <http://www.springer.com/series/7411>

Éric Renault · Selma Boumerdassi ·
Cherkaoui Leghris · Samia Bouzefrane (Eds.)

Mobile, Secure, and Programmable Networking

5th International Conference, MSPN 2019
Mohammedia, Morocco, April 23–24, 2019
Revised Selected Papers

Editors

Éric Renault
Télécom SudParis
Évry, France

Cherkaoui Leghris
Hassan II Mohammedia University
Mohammedia, Morocco

Selma Boumerdassi
Conservatoire National des Arts et Métiers
Paris, France

Samia Bouzebrane
Conservatoire National des Arts et Métiers
Paris, France

ISSN 0302-9743

ISSN 1611-3349 (electronic)

Lecture Notes in Computer Science

ISBN 978-3-030-22884-2

ISBN 978-3-030-22885-9 (eBook)

<https://doi.org/10.1007/978-3-030-22885-9>

LNCS Sublibrary: SL5 – Computer Communication Networks and Telecommunications

© Springer Nature Switzerland AG 2019

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, expressed 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

The rapid deployment of new infrastructures based on network virtualization and cloud computing triggers new applications and services that in turn generate new constraints such as security and/or mobility. The International Conference on Mobile, Secure, and Programmable Networking (MSPN) aims at providing a top forum for researchers and practitioners to present and discuss new trends in networking infrastructures, security, services, and applications while focusing on virtualization and cloud computing for networks, network programming, software defined networks (SDN), and their security. In 2019, MSPN was hosted by the Faculté des Sciences et Techniques (FST) of Mohammedia, a member of Hassan II University, one of the most important universities in Morocco.

The call for papers resulted in a total of 48 submissions from all around the world: Algeria, France, Germany, India, Mauritania, Morocco, Saudi Arabia, Senegal, Tunisia. All submissions were assigned to at least three members of the Program Committee for review. The Program Committee decided to accept 23 papers. Five intriguing keynotes from Antoine GALLAIS, Inria Lille, France, Awatif HAYAR, Hassan II University of Casablanca, Morocco, Bruno STEVANT, IMT Atlantique, France, Guy PUJOLLE, University of Paris 6, France, and Mohammed ACHOUR, Cisco Inc., France, completed the technical program.

We would like to thank all who contributed to the success of this conference, in particular the members of the Program Committee and the reviewers for carefully reviewing the contributions and selecting a high-quality program. Our special thanks go to the members of the Organizing Committee for their great help.

We hope that all participants enjoyed this successful conference, made many new contacts, engaged in fruitful discussions, and had a pleasant stay in Mohammedia, Morocco.

April 2019

Cherkaoui Leghris
Selma Boumerdassi
Éric Renault

Organization

MSPN 2019 was jointly organized by the Faculty of Sciences and Techniques (FST) of Mohammedia, Hassan II University, Morocco, the Wireless Networks and Multimedia Services (RS2M) Department of Télécom SudParis (TSP), a member of Institut Mines-Télécom (IMT) and University Paris-Saclay, France, and Conservatoire National des Arts et Métiers (CNAM), France.

General Chairs

Cherkaoui Leghris	FSTM, UH2C, Morocco
Selma Boumerdassi	CNAM, France
Éric Renault	IMT-TSP, France

Steering Committee

Selma Boumerdassi	CNAM, France
Éric Renault	IMT-TSP, France
Samia Bouzeffrane	CNAM, France

Publicity Chair

Rahim Haiahem	ENSI, Tunisia
---------------	---------------

Organizing Committee

Abdellah Adib	FSTM, UH2C, Morocco
Habib Ayad	FSTM, UH2C, Morocco
Lahcen El Bouny	FSTM, FSTM, UH2C, Morocco
Fouad Elhajji	FSTM, FSTM, UH2C, Morocco
Ali Elksimi	FSTM, FSTM, UH2C, Morocco
Lamia Essalhi	ADDA, France
Mustapha Jebbar	University Hassan II, Morocco
Mohammed Khalil	FSTM, UH2C, Morocco
Feddoul Khoukhi	FSTM, UH2C, Morocco
Mouad Mansouri	FSTM, FSTM, UH2C, Morocco
Lahcen Mchaara	FSTM, FSTM, UH2C, Morocco
Noureddine Moukine	FSTM, UH2C, Morocco
Said Raddouche	FSTM, FSTM, UH2C, Morocco
Mouad Riyad	FSTM, FSTM, UH2C, Morocco
Sara Sekkat	FSTM, FSTM, UH2C, Morocco

Technical Program Committee

Abdellah Adib	FSTM, UH2C, Morocco
Abdeslam Annaque	EMI, UM5, Morocco
Mounir Arioua	Abdelmalek Essaadi University, Morocco
Habib Ayad	FSTM, UH2C, Morocco
Khalid Baamrani	ENSA, UCA, Morocco
Mohamed Belaoued	University of Constantine, Algeria
Assia Belbachir	IPSA, France
Aissa Belmeguenai	University of Skikda, Algeria
Hassan Berbia	ENSIAS, UM5, Morocco
Indayara Bertoldi Martins	PUC Campinas, Brazil
Luiz Bittencourt	University of Campinas, Brazil
Naïla Bouchemal	ECE Paris, France
Nardjes Bouchemal	University Center of Mila, Algeria
Selma Boumerdassi	CNAM, France
Ahcene Bounceur	University of Brest, France
Luca Caviglione	National Research Council, Italy
Driss Chana	EST, UMI, Morocco
De-Jiu Chen	KTH, Sweden
Yeh-Ching Chung	National Tsing Hua University, Taiwan
Domenico Ciuonzo	Network Measurement and Monitoring (NM2), Italy
Sanae El Filali	FSB, UH2C, Morocco
Raja Ellassali	ENSA, UCA, Morocco
Paul Farrow	BT, UK
Hacène Fouchal	Université de Reims Champagne-Ardenne, France
Aravinthan Gopalasingham	NOKIA Bell Labs, France
Jean-Charles Grégoire	INRS, Canada
Viet Hai Ha	Hue University, Vietnam
Awatif Hayar	ENSEM, UH2C, Morocco
Alberto Huertas Celdran	University of Murcia, Spain
Noureddine Idboufker	ENSA, UCA, Morocco
Mohammed Khalil	FSTM, UH2C, Morocco
Feddoul Khoukhi	FSTM, UH2C, Morocco
Donghyun Kim	Kennesaw State University, GA, USA
Adam Krzyzak	Concordia University, QC, Canada
Mohammed Lahby	EST, UH2C, Morocco
Cherkaoui Leghris	Hassan II University, Morocco
Zoltán Mann	University of Duisburg-Essen, Germany
Natarajan Meghanathan	Jackson State University, USA
Saurabh Mehta	Vidyalankar Institute of Technology, Mumbai, India
Abdeltif Mezrioui	INPT, Morocco
Redha Mili	University of Constantine, Algeria
Ruben Milocco	Universidad Nacional del Comahue, Argentina
Pascale Minet	Inria, France
Noureddine Moumkine	FSTM, UH2C, Morocco

Paul Mühlethaler	Inria, France
Benayyad Nsiri	ENSET, UM5, Morocco
Frank Phillipson	TNO, The Netherlands
Éric Renault	IMT-TSP, France
Abdallah Rhattoy	EST, UMI, Morocco
Rachid Saadane	EHTP, Morocco
Hamida Seba	University of Lyon, France
Abderrahim Sekkaki	FSAC, UH2C, Morocco
Augustin Solanas Gomez	Universitat Rovira i Virgili, Spain
Patrick Sondi	Université du Littoral, France
Mounir Tahar Abbes	University of Chlef, Algeria
Van Long Tran	Hue Industrial College, Vietnam
Vinod Kumar Verma	Sant Longowal Institute of Engineering and Technology, India
Martine Wahl	IFSTTAR, France
Lei Zhang	East China Normal University, China

Sponsoring Institutions

CNAM, Paris, France
FST, Hassan II University, Mohammedia, Morocco
IMT-TSP, Évry, France
IT Innov Research Development, Mohammedia, Morocco

Contents

Deep Generative Models for Image Generation: A Practical Comparison Between Variational Autoencoders and Generative Adversarial Networks. . . .	1
<i>Mohamed El-Kaddoury, Abdelhak Mahmoudi, and Mohammed Majid Himmi</i>	
A Game Stochastic Model for Data Dissemination Between Ferries and Cluster Head in Delay Tolerant Networks Routing Hierarchical Topology	9
<i>El Arbi Abdellaoui Alaoui, Mustapha El Moudden, Khalid Nassiri, and Said Agoujl</i>	
Delay-Bandwidth Optimization Method Based on Ant Colony Algorithm Applied to Transport Network Using SDN Paradigm	25
<i>Mounir Azizi, Redouane Benaini, and Mouad Ben Mamoun</i>	
CCN Context-Naming for Efficient Context-Aware Service Discovery in IoT.	37
<i>Mohamed Labbi and Mohammed Benabdellah</i>	
Efficient Distributed Authentication and Access Control System Management for Internet of Things Using Blockchain	51
<i>Hadjer Benhadj Djilali and Djamel Tandjaoui</i>	
Design of a New Patch Antenna Using EBG Structures and Superstrate Operating in the Ku-Band for 5G Cellular Networks	61
<i>Sanae Dellaoui, Adel Asselman, Saida Ahyoud, Abdelmoumen Kaabal, Loubna Rmili, and Mustapha Elhalaoui</i>	
A Data-Filtering Approach for Large-Scale Integrated RFID and Sensor Networks.	69
<i>Mourad Ouadou, Hajar Sahbani, Ouadoudi Zytoune, and Mohamed Ouadou</i>	
High Gain Metallic Electromagnetic Band Gap Antenna for WLAN Applications.	82
<i>Loubna Rmili, Adel Asselman, Abdelmoumen Kaabal, Sanae Dellaoui, and Mustapha El Halaoui</i>	
Toward Design of Advanced System-on-Chip Architecture for Mobile Computing Devices.	88
<i>Mohammed S. BenSaleh, Syed Manzoor Qasim, and Abdulfattah M. Obeid</i>	

A Multiresolution-Based Fusion Strategy for Improving Speech Emotion Recognition Efficiency	96
<i>Sara Sekkate, Mohammed Khalil, Abdellah Adib, and Sofia Ben Jebara</i>	
ECG Beat Classification Based on Stationary Wavelet Transform	110
<i>Lahcen El Bouny, Mohammed Khalil, and Abdellah Adib</i>	
Cross-Subject EEG Signal Classification with Deep Neural Networks Applied to Motor Imagery	124
<i>Mouad Riyad, Mohammed Khalil, and Abdellah Adib</i>	
Data Communication in Electromagnetic Nano-networks for Healthcare Applications	140
<i>Hanan Ferjani and Haifa Touati</i>	
A Distributed Ensemble of Deep Convolutional Neural Networks with Random Forest for Big Data Sentiment Analysis	153
<i>Badr Ait Hammou, Ayoub Ait Lahcen, and Salma Mouline</i>	
Road Safety Against Sybil Attacks Based on RSU Collaboration in VANET Environment	163
<i>Said Benkirane</i>	
A New Alert Message Dissemination Protocol for VANETs Based on Leach Routing Protocol and Simulation in Random Waypoint Model Scenario	173
<i>Hamid Barkouk, El Mokhtar En-Naimi, Mounir Arioua, and Aziz Mahboub</i>	
Towards Semantic Integration of Heterogeneous Data Based on the Ontologies Modeling	188
<i>Cheikh Ould El Mabrouk and Karim Konaté</i>	
A Comparison Between MADM Methods and Utility Functions in the Network Selection Context	201
<i>Mouad Mansouri and Cherkaoui Leghris</i>	
A Robust Blind 3-D Mesh Watermarking Technique Based on SCS Quantization and Mesh Saliency for Copyright Protection	211
<i>Mohamed Hamidi, Aladine Chetouani, Mohamed El Haziti, Mohammed El Hassouni, and Hocine Cherifi</i>	
A New Mechanism to Secure IPv6 Networks Using Symmetric Cryptography	229
<i>Ali El Ksimi and Cherkaoui Leghirs</i>	

Deep Neural Networks for Indoor Localization Using WiFi Fingerprints 247
 Souad BelMannoubi and Haifa Touati

A New Secure Cellular Automata Cryptosystem for Embedded Devices. . . . 259
 Youssef Sbaytri, Saiida Lazaar, Hafssa Benaboud, and Said Bouchkaren

An ElGamal-Like Digital Signature Based on Elliptic Curves 268
 Leila Zahhafi and Omar Khadir

Author Index 277