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

267

Editorial Board

Ozgur Akan

Middle East Technical University, Ankara, Turkey

Paolo Bellavista

University of Bologna, Bologna, Italy

Jiannong Cao

Hong Kong Polytechnic University, Hong Kong, Hong Kong

Geoffrey Coulson

Lancaster University, Lancaster, UK

Falko Dressler

University of Erlangen, Erlangen, Germany

Domenico Ferrari

Università Cattolica Piacenza, Piacenza, Italy

Mario Gerla

UCLA, Los Angeles, USA

Hisashi Kobayashi

Princeton University, Princeton, USA

Sergio Palazzo

University of Catania, Catania, Italy

Sartai Sahni

University of Florida, Florida, USA

Xuemin Sherman Shen

University of Waterloo, Waterloo, Canada

Mircea Stan

University of Virginia, Charlottesville, USA

Jia Xiaohua

City University of Hong Kong, Kowloon, Hong Kong

Albert Y. Zomaya

University of Sydney, Sydney, Australia

More information about this series at http://www.springer.com/series/8197

Joao Carlos Ferreira · Ana Lúcia Martins · Vitor Monteiro (Eds.)

Intelligent Transport Systems, From Research and Development to the Market Uptake

Second EAI International Conference, INTSYS 2018 Guimarães, Portugal, November 21–23, 2018 Proceedings



Editors
Joao Carlos Ferreira
ISCTE-IUL
Lisbon, Portugal

Vitor Monteiro D University of Minho Guimaraes, Portugal Ana Lúcia Martins DISCTE-IUL Lisbon, Portugal

ISSN 1867-8211 ISSN 1867-822X (electronic) Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering ISBN 978-3-030-14756-3 ISBN 978-3-030-14757-0 (eBook) https://doi.org/10.1007/978-3-030-14757-0

Library of Congress Control Number: 2019932914

© ICST Institute for Computer Sciences, Social Informatics and Telecommunications Engineering 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, 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

We are delighted to introduce the proceedings of the second edition of the International Conference on Intelligent Transport Systems (INTSYS 2018) organized by European Alliance for Innovation (EAI), which was held in Guimarães, Portugal. This conference brought together researchers, developers, and practitioners from around the world who are leveraging and developing intelligent transportation systems (ITS) to increase efficiency, safety, mobility, and tackle Europe's growing emission and congestion problems. The theme of INTSYS 2018 was "Intelligent Transport Systems (ITS) and Logistics," allowing participants to discuss relevant topics connecting these two subjects.

The technical program of INTSYS 2018 consisted of 11 full papers in oral presentation sessions at the main conference tracks selected from 16 submissions. All papers were subject to a peer-review blinded process with a minimum of three reviewers per paper and an average of 3.5 reviews per paper. It was a great pleasure to work with the excellent organizing team of the EAI, which was essential for the success of the INTSYS 2018 conference. In particular, we would like to express our gratitude to Kristina Lappyova and Marek Kaleta for all the support they provided in all areas. We would like also to express our gratitude to all the members of the Technical Program Committee, who helped in the peer-review process of the technical papers, which allowed us to have a high-quality technical program. We would like to thank the extensive list of external reviewers from several areas of expertise and from numerous countries around the world.

We strongly believe that the INTSYS conference provides a good forum for researchers, developers, and practitioners to discuss science and technology aspects that are relevant to ITS. We expect that the future INTSYS conference will be as successful and stimulating as indicated by the contributions presented in this volume.

February 2019

Joao Carlos Ferreira Ana Lúcia Martins Vitor Monteiro

Conference Organization

Steering Committee

Imrich Chlamtac Bruno Kessler Professor, University of Trento, Italy

Organizing Committee

General Chair

Joao Carlos Ferreira Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

General Co-chair

Ana Lúcia Martins Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

TPC Chair and Co-chairs

Ana de Almeida Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

Paulo Novais University of Minho, Portugal

Sponsorship and Exhibit Chair

Alexander Kocian Pisa University, Italy

Local Chair

Vitor Monteiro University of Minho, Portugal

Workshops Chair

Jose Aguilar Madeira IST, Portugal

Publicity and Social Media Chair

Sara Eloy Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

Publications Chair

Sophia Kalakou Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

Web Chair

Frederica Gonçalves Madeira University, Portugal

Posters and PhD Track Chair

Ana Madureira ISEP, Portugal

Panels Chair

VIII

Alberto Silva IST, Portugal

Demos Chair

Stefano Chessa Pisa University, Italy

Tutorials Chair

Porfirio Filipe ISEL, Portugal

Conference Managers

Kristina Lappyova EAI, Slovakia Marek Kaleta EAI, Slovakia

Technical Program Committee

Alberto Fernandez European GNSS Agency

Wyttenbach

Alberto Silva IST, Portugal

Ana de Almeida Instituto Universitário de Lisboa (ISCTE-IUL), Portugal Instituto Universitário de Lisboa (ISCTE-IUL), Portugal Dagmar Caganova Slovak University of Technology in Bratislava, Slovakia Slovak University of Technology in Bratislava, Slovakia

Giuseppe Lugano University of Žilina, Slovakia

Joao C. Ferreira Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

Lorna Uden Staffordshire University, UK
Lubos Buzna University of Zilina, Slovakia
Marek Kvet University of Žilina, Slovakia
Michal Kohani University of Žilina, Slovakia
Michal Kvet University of Žilina, Slovakia

Miroslav Svitek Czech Technical University in Prague, Czech Republic

Peter Brida University of Žilina, Slovakia Peter Holečko University of Žilina, Slovakia Peter Jankovic University of Zilina, Slovakia Peter Pocta University of Zilina, Slovakia

Porfirio Filipe ISEL, Portugal

Sara Eloy Instituto Universitário de Lisboa (ISCTE-IUL), Portugal Sophia Kalakou Instituto Universitário de Lisboa (ISCTE-IUL), Portugal

Tatiana Kováčiková University of Žilina, Slovakia Veronika Sramova University of Žilina, Slovakia University of Minho, Portugal

Contents

Parking and Collaborative Approaches	
A Blockchain and Gamification Approach for Smart Parking João Carlos Ferreira, Ana Lúcia Martins, Frederica Gonçalves, and Rui Maia	3
A Low-Cost Smart Parking Solution for Smart Cities Based on Open Software and Hardware	15
Collaborative Gamified Approach for Transportation	26
Case Studies and Simulation	
Improving Fleet Solution – A Case Study	41
Challenges in Object Detection Under Rainy Weather Conditions	53
Simulation and Testing of a Platooning Cooperative Longitudinal Controller	66
ROM-P: Route Optimization Management of Producer Mobility in Information-Centric Networking	81
Mobility and Planning	
Smart Mobility: A Mobile Approach	95
Prediction of Journey Destination for Travelers of Urban Public Transport: A Comparison Model Study	113
Vera Costa, Tânia Fontes, José Luís Borges, and Teresa Galvão Dias	113

X Contents

With Whom Transport Operators Should Partner? An Urban Mobility and Services Geolocation Data Analysis.	133
Marta Campos Ferreira, Teresa Galvão Dias, and João Falcão e Cunha	
Intermodal Routing Model for Sustainable Transport Through	
Multi-objective Optimization	144
Cecília Vale and Isabel M. Ribeiro	
Future 5V	
A Low Latency SCAN-Flip Polar Decoder for 5G Vehicular	
Communication	157
Yu Wang, Lirui Chen, Shikai Qiu, Li Huang, and Zuocheng Xing	
Author Index	171