Lecture Notes in Computer Science 13475

Founding Editors

Gerhard Goos

Karlsruhe Institute of Technology, Karlsruhe, Germany

Juris Hartmanis

Cornell University, Ithaca, NY, USA

Editorial Board Members

Elisa Bertino

Purdue University, West Lafayette, IN, USA

Wen Gao

Peking University, Beijing, China

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Moti Yung

Columbia University, New York, NY, USA

More information about this series at https://link.springer.com/bookseries/558

Irfan Awan · Muhammad Younas · Aneta Poniszewska-Marańda (Eds.)

Mobile Web and Intelligent Information Systems

18th International Conference, MobiWIS 2022 Rome, Italy, August 22–24, 2022 Proceedings



Editors Irfan Awan University of Bradford Bradford, UK

Aneta Poniszewska-Marańda Lodz University of Technology Lodz, Poland Muhammad Younas Oxford Brookes University Oxford, UK

ISSN 0302-9743 ISSN 1611-3349 (electronic) Lecture Notes in Computer Science ISBN 978-3-031-14390-8 ISBN 978-3-031-14391-5 (eBook) https://doi.org/10.1007/978-3-031-14391-5

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2022

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

It is a great privilege to present the proceedings of the 18th International Conference on Mobile Web and Intelligent Information Systems (MobiWis 2022). The conference was held during August 22–24, 2022, in a hybrid mode. We were pleased that in addition to online presentations, the conference was held onsite in the historic city of Rome, Italy. According to UNESCO, Rome is a World Heritage site with magnificent monuments such as the Roman Forum, Colosseum, Trevi Fountain, St. Peter's Basilica, Spanish Steps, Piazza Navona, and many others. Rome is one of the most visited destinations in Europe, as well as the world, as millions of international visitors visit Rome each year.

MobiWis 2022 provided a good setting for discussing recent developments in various topics related to mobile web and intelligent information systems. The objective was to bring academic and industry researchers, engineers, and practitioners together to exchange ideas, experiences, and research results and discuss future challenges in mobile web and intelligent information systems. The use of mobile devices such as smart phones, tablets, and wearable gadgets has significantly increased in recent years. Though such devices provide various facilities to users, they also pose significant research challenges, which include, for instance, issues related to maintaining an appropriate level of security and privacy; managing and maintaining the underlying mobile networks as well as communication media and protocols; effective and user-friendly design of software for mobile devices by taking account of human—computer interaction and related principles; and deploying and applying mobile web systems and tools in prototype applications as well as in businesses and organizations.

The conference technical committee put together an exciting program which included papers on timely and emerging topics such as mobile technology acceptance, software-defined networks, user-interface design, intelligent services, and security and privacy with practical applications in healthcare, public transportation, etc. Papers accepted for the conference came from authors based in both academic research institutes and industry.

The COVID-19 pandemic had a negative effect on productivity in every sector, including education, research, business, industry, and the public sector. Researchers were unable to work at full capacity as they had limited resources and faced constraints in terms of access to required research facilities such as labs, equipment, and data. Despite these challenges, MobiWis 2022 received a good number of quality submissions from authors from different countries across the world. Members of the Program Committee rigorously reviewed all submitted papers. Based on the reviews, 18 papers were accepted for the conference, which is around 35% of the total submissions.

The success of this conference is truly attributed to the organizing and technical committee members who made serious efforts for the smooth running of the conference. We greatly appreciate all the committee members who contributed their time and efforts to organize the conference. We are sincerely grateful to the Program Committee members who provided timely, constructive, and balanced feedback to the authors. We are also thankful to the authors for their contributions to the conference.

vi Preface

We sincerely thank Markus Aleksy and Stephan Böhm (General Co-chairs), Filipe Portela (Workshop Coordinator), Nor Shahniza Kamal Bashah (Publicity Chair), and Natalia Kryvinska (Special Issue Coordinator) for their help and support.

We greatly appreciate the Springer LNCS team for their valuable support in the production of the conference proceedings.

August 2022

Irfan Awan Muhammad Younas Aneta Poniszewska-Marańda

Organization

General Co-chairs

Markus Aleksy ABB, Germany

Stephan Böhm RheinMain University of Applied Sciences,

Germany

Program Co-chairs

Aneta Poniszewska-Marańda Lodz University of Technology, Poland

Muhammad Younas Oxford Brookes University, UK

Publication Chair

Irfan Awan University of Bradford, UK

Journal Special Issue Coordinator

Natalia Kryvinska University of Vienna, Austria

Workshop Coordinator

Filipe Portela University of Minho, Portugal

Publicity Chair

Nor Shahniza Kamal Bashah Universiti Teknologi Mara, Malaysia

Program Committee

Omar Abdel Wahab University of Quebec at Outaouais, Canada Fatma Abdennadher National School of Engineering of Sfax, Tunisia

Pablo Adasme University of Santiago de Chile, Chile Novia Admodisastro Universiti Putra Malaysia, Malaysia

Thomas Barton University of Applied Sciences Worms, Germany

Christian Baun Frankfurt University of Applied Sciences,

Germany

Mohamed Ben Aouicha National School of Engineering of Sfax, Tunisia Lukasz Chomatek Lodz University of Technology, Poland

Maria Luisa Damiani Universita degli Studi di Milano, Italy

Ivan Demydov Lviv Polytechnic National University, Ukraine Christophe Feltus Luxembourg Institute of Science and Technology,

Luxembourg

Lalit Garg University of Malta, Malta
Sergio Ilarri University of Zaragoza, Spain
John Isaacs Robert Gordon University, UK

Katty Rohoden Jaramillo Universidad Técnica Particular de Loja, Ecuador

Dan Johansson Umea University, Sweden

Norazlina Khamis Universiti Malaysia Sabah, Malaysia

Pınar Kirci Istanbul University, Turkey

Shinsaku Kiyomoto KDDI R&D Laboratories Inc., Japan

Ondrej Krejcar University of Hradec Kralove, Czech Republic

Abdel Lisser CentraleSupélec, France Jung-Chun Liu Tunghai University, Taiwan

Johannes Luderschmidt RheinMain University of Applied Sciences,

Germany

Lech Madeyski Wroclaw University of Technology, Poland Ludger Martin RheinMain University of Applied Sciences,

Germany

Riccardo Martoglia University of Modena and Reggio Emilia, Italy

Inmaculada Medina Bulo Universidad de Cádiz, Spain

Rabeb Mizouni Khalifa University of Science and Technology,

UAE

Paolo Nesi University of Florence, Italy

Artur Niewiadomski Siedlce University of Natural Sciences and

Humanities, Poland

Lidia Ogiela AGH University of Science and Technology,

Poland

Marek R. Ogiela AGH University of Science and Technology,

Poland

Andrea Omicini University of Bologna, Italy

Apostolos Papadopoulos Aristotle University of Thessaloniki, Greece

Mikko Rissanen Improventions, Malaysia Philippe Roose IUT de Bayonne, France

Masahiro Sasabe Nara Institute of Science and Technology, Japan

Florence Sedes Paul Sabatier University, France
Tacha Serif Yeditepe University, Turkey
Jorge Sa Silva University of Coimbra, Portugal

Agnis Stibe EM Normandie Business School, France

Dragan Stojanovic University of Nis, Serbia

Jozef Juhar Raquel Trillo Perin Unal Technical University of Košice, Slovakia University of Zaragoza, Spain METU, Turkey

Contents

Mobile Applications and Technologies	
Knowledge Behavior Gap Model: An Application for Technology Acceptance	3
Agnis Stibe, Nicolai Krüger, and Alina Behne	
UI-Re-Engineering of a Mobile Documentation Software in the Care Sector Sergio Staab, Ludger Martin, and Anika Degreif	18
GUI Element Detection from Mobile UI Images Using YOLOv5	32
Mobile Devices and Autonomous Vehicles	
Active Federated YOLOR Model for Enhancing Autonomous Vehicles	
Safety Gaith Rjoub, Jamal Bentahar, and Y. A. Joarder	49
Neural Network for Public Transport Mode Inference on Mobile Devices	65
Data-Driven Federated Autonomous Driving Ahmad Hammoud, Azzam Mourad, Hadi Otrok, and Zbigniew Dziong	79
Security in Healthcare and Smart Cities Environment	
Case Study on a Session Hijacking Attack: The 2021 CVS Health Data Breach	93
Aversa Prentosito, McKenna Skoczen, Lauren Kahrs, and Suman Bhunia	
Blockchain for Cybersecure Healthcare Avnish Singh Jat and Tor-Morten Grønli	106
Design of a Method for Setting IoT Security Standards in Smart Cities Hana Svecova	118

Software-Defined Networks

Mathematical Models for Minimizing Latency in Software-Defined	121
Networks Pablo Adasme, Andres Viveros, Ali Dehghan Firoozabadi, and Ismael Soto	131
Analyzing the Impact of DNN Hardware Accelerators-Oriented Compression Techniques on General-Purpose Low-End Boards Giuliano Canzonieri, Salvatore Monteleone, Maurizio Palesi, Enrico Russo, and Davide Patti	143
Spatial Dependency in Software-Defined Networking In-Band Monitoring: Challenges and Future Perspective Chin Jun Nan and Tan Saw Chin	156
Smart Systems and Applications	
What is a Smart Service?	165
SSSB: An Approach to Insurance for Cross-Border Exchange by Using	
Smart Contracts Khoi Le Quoc, Hong Khanh Vo, Luong Hoang Huong, Khiem Huynh Gia, Khoa Tran Dang, Hieu Le Van, Nghia Huynh Huu, Tran Nguyen Huyen, The Anh Nguyen, Loc Van Cao Phu, Duy Nguyen Truong Quoc, Bang Le Khanh, and Ha Xuan Son	179
A Review: Sensors Used in Tool Wear Monitoring and Prediction Perin Ünal, Bilgin Umut Deveci, and Ahmet Murat Özbayoğlu	193
Advanced Information Systems	
Towards the Use of IT Technologies for Health Literacy and Health Information Competences – A Case Study Marta Chmielewska-Anielak, Aneta Poniszewska-Marańda, and Agnieszka Renn-Zurek	209
A Systematic Literature Review on Relationship Between Internet Usage Behavior and Internet QoS in Campus	223

	Contents	xiii
Model Checking Intelligent Information Systems with 3-Valued Time Commitments		237
Author Index		253