



HAL
open science

Digital Transformation for a Sustainable Society in the 21st Century

Ilias Pappas, Patrick Mikalef, Yogesh Dwivedi, Letizia Jaccheri, John
Krogstie, Matti Mäntymäki

► **To cite this version:**

Ilias Pappas, Patrick Mikalef, Yogesh Dwivedi, Letizia Jaccheri, John Krogstie, et al.. Digital Transformation for a Sustainable Society in the 21st Century: I3E 2019 IFIP WG 6.11 International Workshops, Trondheim, Norway, September 18–20, 2019, Revised Selected Papers. Springer International Publishing, AICT-573, 2020, IFIP Advances in Information and Communication Technology, 978-3-030-39633-6. 10.1007/978-3-030-39634-3 . hal-03759106

HAL Id: hal-03759106

<https://inria.hal.science/hal-03759106>

Submitted on 24 Aug 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.




Distributed under a Creative Commons Attribution 4.0 International License

Editor-in-Chief

Kai Rannenberg, Goethe University Frankfurt, Germany

Editorial Board Members

TC 1 – Foundations of Computer Science

Luis Soares Barbosa , University of Minho, Braga, Portugal

TC 2 – Software: Theory and Practice

Michael Goedicke, University of Duisburg-Essen, Germany

TC 3 – Education

Arthur Tatnall , Victoria University, Melbourne, Australia

TC 5 – Information Technology Applications

Erich J. Neuhold, University of Vienna, Austria

TC 6 – Communication Systems

Burkhard Stiller, University of Zurich, Zürich, Switzerland

TC 7 – System Modeling and Optimization

Fredi Tröltzsch, TU Berlin, Germany

TC 8 – Information Systems

Jan Pries-Heje, Roskilde University, Denmark


TC 9 – ICT and Society

David Kreps , University of Salford, Greater Manchester, UK

TC 10 – Computer Systems Technology

Ricardo Reis , Federal University of Rio Grande do Sul, Porto Alegre, Brazil


TC 11 – Security and Privacy Protection in Information Processing Systems

Steven Furnell , Plymouth University, UK

TC 12 – Artificial Intelligence

Eunika Mercier-Laurent , University of Reims Champagne-Ardenne, Reims, France

TC 13 – Human-Computer Interaction

Marco Winckler , University of Nice Sophia Antipolis, France

TC 14 – Entertainment Computing

Rainer Malaka, University of Bremen, Germany

IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the first World Computer Congress held in Paris the previous year. A federation for societies working in information processing, IFIP's aim is two-fold: to support information processing in the countries of its members and to encourage technology transfer to developing nations. As its mission statement clearly states:

IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.


More information about this series at <http://www.springer.com/series/6102>

Ilias O. Pappas · Patrick Mikalef ·
Yogesh K. Dwivedi · Letizia Jaccheri ·
John Krogstie · Matti Mäntymäki (Eds.)


Digital Transformation for a Sustainable Society in the 21st Century

I3E 2019 IFIP WG 6.11 International Workshops
Trondheim, Norway, September 18–20, 2019
Revised Selected Papers

Editors

Ilias O. Pappas 
University of Agder
Kristiansand, Norway


Norwegian University of Science
and Technology
Trondheim, Norway

Yogesh K. Dwivedi 
Swansea University
Swansea, UK

John Krogstie
Norwegian University of Science
and Technology
Trondheim, Norway

Patrick Mikalef 
Norwegian University of Science
and Technology and SINTEF
Trondheim, Norway

Letizia Jaccheri 
Norwegian University of Science
and Technology
Trondheim, Norway

Matti Mäntymäki 
University of Turku
Turku, Finland

ISSN 1868-4238

ISSN 1868-422X (electronic)

IFIP Advances in Information and Communication Technology

ISBN 978-3-030-39633-6

ISBN 978-3-030-39634-3 (eBook)

<https://doi.org/10.1007/978-3-030-39634-3>

© IFIP International Federation for Information Processing 2020, corrected publication 2020

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

During the 18th International Federation of Information Processing (IFIP) Conference on e-Business, e-Services, and e-Society (I3E), which was held in Trondheim, Norway, during September 18–20, 2019, we made efforts to offer the opportunity for discussing up-to-date topics under the broad umbrella of e-Business, e-Services, and e-Society. Nonetheless, there are specific topics that require increased attention. This was accomplished by hosting several workshops in parallel with the main conference.

The workshops allow the researchers to present their working ideas and ongoing projects, while at the same time offer the opportunity to discuss research ideas with a highly focused audience. Based on the feedback received during the presentations and the workshops activities, the authors had the opportunity to edit the workshop articles for the current publication.

Four workshops took place during the 18th IFIP I3E 2019 conference. We were proud to host DTIS, TPSIE, 3(IT), and CROPS. Each workshop focused on different topics, with all being connected to the main theme of the I3E 2019 conference “Digital Transformation for a Sustainable Society in the 21st Century.” They focused on Digital Transformation for an Inclusive Society (DTIS), Trust and Privacy Aspects of Smart Information Environments (TPSIE), Innovative Teaching of Introductory Topics in Information Technology (3IT), and CROwd-Powered e-Services (CROPS). A message from the chairs of each workshop is included below.

We would like to express our gratitude to everyone who made the I3E 2019 workshops successful. First of all, our workshop chairs, the members of the workshop Program Committees, authors of submitted papers, invited speakers, and finally all workshop participants.

November 2019

Ilias O. Pappas
Patrick Mikalef
Yogesh K. Dwivedi
Letizia Jaccheri
John Krogstie
Matti Mäntymäki

Conference Organization

Conference Chairs

Ilias O. Pappas	University of Agder and Norwegian University of Science and Technology (NTNU), Norway
Patrick Mikalef	Norwegian University of Science and Technology (NTNU) and SINTEF, Norway
Yogesh K. Dwivedi	Swansea University, UK
Letizia Jaccheri	Norwegian University of Science and Technology (NTNU), Norway
John Krogstie	Norwegian University of Science and Technology (NTNU), Norway

Program Committee Chairs

Ilias O. Pappas	University of Agder and Norwegian University of Science and Technology (NTNU), Norway
Patrick Mikalef	Norwegian University of Science and Technology (NTNU) and SINTEF, Norway
Yogesh K. Dwivedi	Swansea University, UK
Letizia Jaccheri	Norwegian University of Science and Technology (NTNU), Norway
John Krogstie	Norwegian University of Science and Technology (NTNU), Norway
Matti Mäntymäki	University of Turku, Finland

Contents

Digital Transformation for an Inclusive Society - DTIS

Everybody Rock Your Equity: Experiences of Organizing a Women in Computing Event with Role Models for Diversity and Inclusion	5
<i>Virginia Grande, Clara Benac-Earle, Cristina Manresa-Yee, Elena Gómez-Martínez, Laura M. Castro, Patricia Pons, and Raúl Corobán</i>	
Alenta: A Practitioner’s Case of Technology Usage to Support Special Needs of Populations with Cognitive Disabilities	17
<i>Guadalupe Montero de Espinosa and Juan C. Torrado</i>	
Evaluating Digitalization of Social Services from the Viewpoint of the Citizen	23
<i>Anne-Marie Tuikka</i>	
eHealth Approach for Motivating Physical Activities of People with Intellectual Disabilities	31
<i>Valter Berg, Vebjørn Haugland, Marius Foshaug Wiik, Henriette Michalsen, Audny Anke, Miroslav Muzny, Javier Gomez, Santiago Gil Martinez, Antonio Martinez-Millana, Andre Henriksen, Keiichi Sato, and Gunnar Hartvigsen</i>	

Trust and Privacy Aspects of Smart Information Environments - TPSIE

Towards a Right not to Be Deceived? An Interdisciplinary Analysis of Media Personalization in the Light of the GDPR.	47
<i>Urbano Reviglio</i>	
Software Assisted Privacy Impact Assessment in Interactive Ubiquitous Computing Systems.	60
<i>Alfredo Pérez Fernández and Guttorm Sindre</i>	
Facilitating GDPR Compliance: The H2020 BPR4GDPR Approach	72
<i>Georgios V. Lioudakis, Maria N. Koukovini, Eugenia I. Papagiannakopoulou, Nikolaos Dellas, Kostas Kalaboukas, Renata Medeiros de Carvalho, Marwan Hassani, Lorenzo Bracciale, Giuseppe Bianchi, Adrian Juan-Verdejo, Spiros Alexakis, Francesca Gaudino, Davide Cascone, and Paolo Barracano</i>	

Designing a Privacy Dashboard for a Smart Manufacturing Environment 79
Felix Mannhardt, Manuel Oliveira, and Sobah Abbas Petersen

RRTxFM: Probabilistic Counting for Differentially Private Statistics 86
Saskia Nuñez von Voigt and Florian Tschorsch

Innovative Teaching of Introductory Topics in Information Technology - 3(IT)

Empowering Women to Seek Careers in Game Development and Creative IT Studies 103
Helga Dis Ísfold Sigurðardóttir

ATMF: A Student-Centered Framework for the Effective Implementation of Alternative Teaching Methods for CSEd 116
Anastasios Theodoropoulos, Costas Vassilakis, Angeliki Antoniou, Manolis Wallace, and George Lepouras

Framework for Pupil-to-Student Transition, Learning Environment and Semester Start for First-Year Students 128
Omid Mirmotahari, Gunnar Rye Bergersen, Yngvar Berg, Kristin Bråthen, and Kristin Broch Eliassen

CROwd-Powered e-Services - CROPS

Crowd-Based Assessment of Deformational Cranial Asymmetries 145
Kathrin Borchert, Matthias Hirth, Angelika Stellzig-Eisenhauer, and Felix Kunz

CuneiForce: Involving the Crowd in the Annotation of Unread Mesopotamian Cuneiform Tablets Through a Gamified Design 158
Martín López-Nores, Juan Luis Montero-Fenollós, Marta Rodríguez-Sampayo, José Juan Pazos-Arias, Silvia González-Soutelo, and Susana Reboreda-Morillo

Exploring Self-organisation in Crowd Teams 164
Ioanna Lykourantzou, Antonios Liapis, Costas Papastathis, Konstantinos Papangelis, and Costas Vassilakis

Correction to: Crowd-Based Assessment of Deformational Cranial Asymmetries C1
Kathrin Borchert, Matthias Hirth, Angelika Stellzig-Eisenhauer, and Felix Kunz

Author Index 177