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Responsible AI and Analytics for an Ethical and Inclusive Digitized Society

20th IFIP WG 6.11 Conference on
e-Business, e-Services and e-Society, I3E 2021
Galway, Ireland, September 1–3, 2021
Proceedings


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Preface

This book presents the proceedings of the 20th International Federation of Information Processing (IFIP) Conference on e-Business, e-Services, and e-Society (I3E), which was hosted in Galway, Ireland, 1–3 September 2021. The annual I3E conference is a core part of Working Group 6.11, which aims to organize and promote exchange of information and co-operation related to all aspects of e-business, e-services, and e-society (the three Es). The I3E conference series is truly interdisciplinary and welcomes contributions from both academics and practitioners alike.

The central theme of the 2021 conference was Responsible AI and Analytics for an Ethical and Inclusive Digitized Society although, in line with the inclusive nature of the I3E series, all papers related to e-Business, e-Services, and e-Society were welcome. Digital technologies (e.g., AI, Blockchain, Big Data Analytics), and ICT in general, create opportunities and unintended or negative consequences for individuals and society (Gupta et al., 2021; Majchrzak et al., 2016). These opportunities and consequences have not been evenly distributed. Therefore, the aim of the conference was to bring together a community for the advancement of knowledge regarding the adoption, use, impact, and value of digital technologies across e-business, e-services, and e-society.

Despite the many personal, economic, and societal benefits offered by AI and analytics (Dennehy, 2020; Pappas et al., 2018), their use raises a variety of ethical concerns that need to be addressed in order to create a “good AI society” (Fossa Wamba et al., 2021). Ethics permeates the entire analytics process, from what data to use, to how to represent the extracted knowledge and exploit the insights to create economic and social value. Ethical concerns (e.g., illegitimate surveillance, invasion of privacy, unemployment, malicious use, etc.) are frequently used to portray AI and other digital technologies as a danger to humanity. For example, digital exclusion is part of the overall challenge of exclusion, a growing phenomenon which carries with it a series of deteriorations in life paths (e.g., poor lifelong earnings and an increased risk of marginalization). There are many who are currently excluded for reasons of low income and education, location, culture, trust and confidence levels or various disabilities. These concerns warrant the attention of the academic community to ensure the information society is built on a foundation in which integrity and rigor for good science will promote quality systems, and good ethics will promote good professional practice (Calzarossa et al., 2009). Hence, in order to be able to practice in an ethical manner, professionals must see vistas beyond technology (Stoodley et al., 2010).

At the same time, we acknowledge that AI and other digital technologies can offer transformational power across sectors, namely, public (Alshahrani et al., 2021), private (Mikalef and Gupta, 2021), and not-for-profit (Dennehy et al., 2021), ranging from enhanced business operations and supply chains (Cadden et al., 2021) to reinventing business models (Duan et al., 2019) to decision-making (Paschen et al., 2020) to

changing the nature of work (Schwartz et al., 2019) to enhanced human capabilities (e.g., AI-enabled recruiting) (Dwivedi et al., 2021).

The Call for Papers solicited submissions in two main categories: full research papers and short research-in-progress papers. Each submission was reviewed by at least two knowledgeable academics in the field, in a double-blind process. The 2021 conference received submissions from more than 33 countries across the world, including China, Mexico, India, Pakistan, Japan, Kenya, Ghana, Morocco, South Africa, Finland, Sweden, Norway, Greece, the Netherlands, the UK, Papua New Guinea, Canada, and the USA to name a few. The best papers were selected for inclusion in a special issue of *Information Systems Frontiers* or their authors were given the opportunity to enhance the manuscript for fast-track review and publication in *International Journal of Information Management* and *Journal of Decision Systems*. The final set of 57 full papers and 8 short papers submitted to I3E 2021 and appearing in these proceedings were clustered into twelve groups, each of which are outlined below.

Part I encapsulates a core theme of the conference, with nine manuscripts that address the adoption and diffusion of AI for digital transformation and public good.

Part II contains five manuscripts relating to AI and analytics for decision making.

Part III continues the core theme of the conference, drawing together seven manuscripts related AI philosophy, ethics, and governance.

Part IV complements the previous clusters, with five manuscripts related to privacy and transparency in a digitized society.

Part V captures five manuscripts focused on digitally enabled sustainable organizations and societies.

Part VI dovetails with the theme of the previous cluster, with five manuscripts that address digital technologies and organizational capabilities.

Part VII consists of four manuscripts that investigate the role of AI and analytics in digitizing supply chains.

Part VIII contains five manuscripts that address customer behavior and e-business.

Part IX is made up of four manuscripts that examine the opportunities afforded by blockchain technology.

Part X consists of three manuscripts that explore the growing use of AI and analytics in the context of information systems development.

Part XI draws together eight manuscripts that explore social media analytics in a variety of contexts.

Part XII is the final cluster of these proceedings, with five manuscripts focused on AI and analytics in the context of teaching and learning.

In addition to the above papers, we were delighted to welcome Professor Katina Michael, Professor H. Raghav Rao, and Professor Dinesh Kumar as our keynote speakers.

Katina Michael has recently moved to Arizona State University, holding a joint appointment in the School for the Future of Innovation in Society and the School of Computing, Informatics, and Decision Systems Engineering. She is also the director of the Centre for Engineering, Policy, and Society. Katina Michael is also affiliated with the School of Computing and Information Technology at the University of Wollongong. Until recently she was the Associate Dean – International, in the Faculty of Engineering and Information Sciences. Katina was formerly the long-standing IEEE

Technology and Society Magazine editor-in-chief (2012–2017), and is presently an IEEE Consumer Electronics Magazine senior editor. Since 2008 she has been a board member of the Australian Privacy Foundation, and was formerly the Vice-Chair. Her research focuses on the socio-ethical implications of emerging technologies. She has written and edited six books, guest edited numerous special issue journals on themes related to radio-frequency identification (RFID) tags, supply chain management, location-based services, innovation, and surveillance/uberveillance. In 2017, Katina was awarded the prestigious Brian M. O'Connell Award for Distinguished Service to the IEEE Society on the Social Implications of Technology (IEEESSIT).

H. Raghav Rao was named the AT&T Distinguished Chair in Infrastructure Assurance and Security at The University of Texas at San Antonio College of Business in January 2016. He also holds a courtesy appointment as full professor in the UTSA Department of Computer Science. Prior to working at UTSA, H. R. Rao was the SUNY Distinguished Service Professor at the University at Buffalo. He graduated from Krannert Graduate School of Management at Purdue University. His interests are in the areas of management information systems, decision support systems, e-business, emergency response management systems, and information assurance. He has chaired sessions at international conferences and presented numerous papers. He also has co-edited four books, including Information Assurance Security and Privacy Services and Information Assurance in Financial Services. He has authored or co-authored more than 200 technical papers, of which more than 125 are published in archival journals. H. R. Rao was the inaugural recipient of The Bright Internet Award for his contributions to the information systems discipline by KMIS, the Korea Society of Management Information Systems. In 2018, H. R. Rao was awarded the International Federation for Information Processing (IFIP) Outstanding Service Award for significant service contributions to the field of information systems and information systems security. In November 2016, H. R. Rao received the prestigious Information Systems Society Distinguished Fellow Award (Class of 2016) for outstanding intellectual contributions to the information systems discipline. Rao's work has received best paper and best paper runner up awards at ISR, AMCIS, and ICIS. He has received funding for his research from the National Science Foundation, the Department of Defense, and the Canadian Embassy. He also received the Fulbright fellowship in 2004. Rao is a past chair of IFIP WG 8.11/11.13, the working group for Information Systems Security Research. He is co-editor-in-chief of Information Systems Frontiers, advisory editor of Decision Support Systems, associate editor of ACM TMIS, and senior editor at MIS Quarterly.

U Dinesh Kumar is a professor in decision sciences area and also the chairperson of DCAL at the Indian Institute of Management, Bangalore (IIMB). Dinesh Kumar holds a Ph.D. in Mathematics from IIT Bombay and has over two decades of teaching and consulting experience. He has been recognized as one of the top 10 most prominent analytics academicians in India for his extensive research in big data analytics. He has spearheaded the analytics education industry in India. IIMB was one of the first education institutes in the country to offer a regular long-duration certification program on Business Analytics & Intelligence (BAI) in the year 2010. U. Dinesh Kumar is also the Programme Director of the Big Data Analytics certification program. He has published several research articles in reputed academic journals such as the European Journal of

Operational Research, Annals of Operations Research, the International Journal of Production Economics, The Journal of Operational Research Society, Computers and Operations Research, IEEE Transactions on Reliability, and the International Journal of Reliability, Quality and Safety Engineering. He has also published more than 30 case studies on business analytics and machine learning algorithms based on Indian and multinational organizations at Harvard Business Publishing. He has authored 3 books and his most recent book titled “Business Analytics - The Science of Data Driven Decision Making” has been recommended by the All India Council for Technical Education (AICTE). He is the Founder-President of the Analytics Society of India (ASI). U. Dinesh Kumar regularly conducts corporate training programs in analytics and has trained many professionals in the field of analytics in the last 11 years. He has provided analytics consulting services to organizations such as Boston Consulting Group, GE Healthcare, General Motors, Hindustan Aeronautics Limited, Indian Army, TVS Motors, Wipro, and so on. He has conducted in-house training programs on analytics for several organizations including Accenture, Aditya Birla Group, Allianz Benelux, Ashok Leyland, Bank of America, CISCO, Fidelity, Honeywell, and ITC Infotech.

The conference schedule included the IFIP 6.11 Committee Meeting (day 1), live traditional Irish Sean-nós (old style) dancing (day 1), virtual coffee house meet ups (days 1-3), Dr. John Oredo chaired a panel discussion with renowned academics and practitioners on the topic of ethical AI (day 2), Best Paper award (day 2), and the conference concluded with a closing ceremony that included a presentation about I3E 2022 (day 3). Supplementary to the conference was a one-day doctoral symposium that involved presentations from 10 Ph.D. candidates and discussions with the symposium committee.

The success of the 20th IFIP I3E conference was a result of the enormous effort of numerous people and organizations. Firstly, this conference was only made possible by the continued support of WG 6.11 for this conference series and for selecting Galway to host I3E 2021, and for this we are extremely grateful. We are privileged to have received so many good quality submissions from authors across the globe and the biggest thank you must go to them for choosing I3E 2021 as the outlet for their current research. We are indebted to the Program Committee who generously gave up their time to provide constructive reviews and facilitate enhancement of the manuscripts submitted. Finally, we extend our sincere gratitude to everyone involved in organizing the conference, to our esteemed keynote speakers, and to Springer LNCS as the publisher of these proceedings, which we hope will be of use for continued development of research related to the three Es and social media in particular.

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