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Quality of Information and Communications Technology

14th International Conference, QUATIC 2021
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Proceedings

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Preface

The International Conference on the Quality of Information and Communications Technology (QUATIC) serves as a forum for disseminating advanced methods, techniques, and tools for supporting quality approaches to ICT engineering and management. Practitioners and researchers are encouraged to exchange ideas and approaches on how to adopt a quality culture in ICT process and product improvement and to provide practical studies in varying contexts.

QUATIC 2021 was led by Ana C. R. Paiva (Faculty of Engineering of the University of Porto) and Ana R. Cavalli (Institut Polytechnique Paris/Telecom Sud-Paris) as program chairs. The organizing chair of this 14th edition of QUATIC was Paula Ventura Martins (University of Algarve) and the event was locally organized along with Marielba Zacarias and João Dias at the University of Algarve. QUATIC 2021 was planned to be held during September 8–11, 2021 in Faro, Algarve, Portugal. Unfortunately, due to the effects of the COVID-19 pandemic, QUATIC 2021 was conducted as a fully online conference.

This volume is a collection of high-quality peer-reviewed research papers from all over the world. QUATIC 2021 attracted a good number of submissions from different areas spanning several thematic tracks, proposed in the call for papers, in various cutting-edge technologies of specialized focus, organized and chaired by eminent experts of each field. The following nine thematic tracks correspond to QUATIC 2021 sessions:

- ICT Verification and Validation (Francesca Lonetti, ISTI-CNR, Italy)
- Software Evolution (Nicolas Anquetil, Inria and ULille-1, France)
- Process Modeling, Improvement, and Assessment (Karol Frühauf, Infogem AG, Switzerland)
- Quality Aspects in Quantum Computing (Manuel Serrano, UCLM, Spain)
- Safety, Security, and Privacy (Valentina Casola, University of Napoli Federico II, Italy)
- Quality Aspects in Machine Learning, AI, and Data Analytics (Shuo Wang, University of Birmingham, UK)
- Evidence-Based Software Quality Engineering (Fernando Brito e Abreu, ISCTE, Portugal)
- Quality in Cyber-physical Systems (Shaukat Ali, Simula Research Laboratory, Norway)
- Software Quality Education and Training (Claudia Werner, UFRJ, Brazil, and Káthia Marçal de Oliveira, Polytechnic University of Hauts-de-France, France)

Due to the exigent review process, no papers were accepted for the following three tracks:

- ICT Requirements Engineering (Luiz Marcio Cysneiros, York University, Canada and Vera Werneck, State University of Rio de Janeiro, Brazil)

- Model-driven Engineering (Antonio Cicchetti, Mälardalen University, Sweden)
- SEDES - Doctoral Symposium (Miguel Goulão, NOVA School of Science and Technology, Portugal)

Technical Review Summary

The Technical Program Committee of QUATIC 2021 was made up of 171 international academic and industrial domain experts, from organizations in 29 different countries on 5 continents. Based on a rigorous peer-review process by the Technical Program Committee members along with external experts as reviewers, the best quality papers were identified for presentation and publication.

The review was carried out in a double-blind process, with a minimum of three reviews per submission. Submitted papers came from more than 45 countries and accepted papers originated from 26 countries. Out of the submission pool of 98 papers, 30 (30.6%) were accepted as full papers for inclusion in the proceedings and 9 (9.2%) as short papers.

Invited Talk

QUATIC 2021 was fortunate to have three invited talks presented by outstanding keynote speakers.

The first keynote was by Martin Shepperd. Martin Shepperd received a PhD in computer science from the Open University in 1991 for his work in measurement theory and its application to empirical software engineering. He is professor of Software Technology and Modelling at Brunel University London, UK. Previously he has worked as a software developer for HSBC and also as COPUS Fellow in the Parliamentary Office of Science and Technology. He has published more than 180 refereed papers and three books in the areas of software engineering and machine learning. He is a fellow of the British Computer Society.

The second keynote speaker was Manuel Wimmer. Manuel Wimmer is a full professor and head of the Institute for Business Informatics – Software Engineering at the Johannes Kepler University, Linz, Austria. He received his Ph.D. and Habilitation from TU Wien, Austria. He has been a research associate at the University of Malaga, Spain, a visiting professor at the University of Marburg, Germany, as well as at TU Munich, Germany, and an assistant professor at the Business Informatics Group (BIG), TU Wien, Austria. Currently, he is also leading the Christian Doppler Laboratory on Model-Integrated Smart Production (CDL-MINT). He is co-author of the book Model-driven Software Engineering in Practice (Morgan & Claypool, second edition, 2017).

The third talk was given by Jaime Jorge. Jaime Jorge (industry keynote) is the CEO and co-founder of Codacy, one of the best-known platforms for software quality standardization around the world. Jaime has an MSc in Software Engineering from IST and was previously an associate researcher in L2F/INESC-ID in Lisbon, Portugal.

September 2021

Ana C. R. Paiva
Ana Rosa Cavalli
Paula Ventura Martins
Ricardo Pérez-Castillo

Acknowledgments

As proceedings editors, we wish to thank all the people and organizations that directly or indirectly supported this event. Thanks to the thematic track and PhD symposium chairs and all other members of the Technical Program Committee for their many contributions and reviews that guaranteed the overall quality of the QUATIC 2021 conference.

Thanks to our colleagues from the University of Algarve for all the organizational details required for hosting the conference, despite the fact that the constraints and difficulties associated with the COVID-19 pandemic obliged us to do it fully online. Thanks to our colleagues that participated at different levels in the organization of the conference. Thanks to the QUATIC's Steering Committee members for their guidance and support throughout all this process.

Also, a special thanks to all the organizations involved in this conference, including our promoters (IPQ and CS03), supporters (UAlgarve, Brunel University, ISCTE-IUL, IST-UL, UCLM, FCT-UNL, FE-UP, UMinho, CNR, and UCoimbra), sponsor (ACM), and partners (NEEI/UALG and APQ).

Last but not least, special thanks to all the authors and participants at the conference. Without their efforts, there would be no conference or proceedings. Thank you for contributing to the critical mass of researchers that keep this conference alive for what we expect to be many years to come.

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