

Lecture Notes in Networks and Systems

Volume 298

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Michael E. Auer · Kalyan Ram Bhimavaram ·
Xiao-Guang Yue
Editors

Online Engineering and Society 4.0

Proceedings of the 18th International
Conference on Remote Engineering
and Virtual Instrumentation

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ISSN 2367-3370

ISSN 2367-3389 (electronic)

Lecture Notes in Networks and Systems

ISBN 978-3-030-82528-7

ISBN 978-3-030-82529-4 (eBook)

<https://doi.org/10.1007/978-3-030-82529-4>

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This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The REV Conference is the annual conference of the International Association of Online Engineering (IAOE) and the Global Online Laboratory Consortium (GOLC).

REV2021 on “Online Engineering and Society 4.0” was the 18th in a series of annual events concerning the area of remote engineering and virtual instrumentation.

In a globally connected world, the interest in online collaboration, teleworking, remote services and other digital working environments is rapidly increasing. In response to that, the general objective of this conference is to contribute and discuss fundamentals, applications and experiences in the field of online and remote engineering, virtual instrumentation and other related new technologies like cross-reality, data science and big data, Internet of Things and Industrial Internet of Things, Industry 4.0, cloud technologies, cyber security, and M2M and smart objects. Another objective of the conference is to discuss guidelines and new concepts for engineering education in higher and vocational education institutions, including emerging technologies in learning, MOOCs and MOOLs, and open resources.

REV2021 has been organized in cooperation with the International Engineering and Technology Institute (IETI), Hong Kong, and the Technical University of Tallinn, Estonia, as an online event from February 24 to 26, 2021.

REV2021 offered again an exciting technical program as well as networking opportunities. Outstanding scientists and industry leaders accepted the invitation for keynote speeches:

- **Jeff Kodosky**

Co-founder of NI and The Father of LabVIEW

- **Javier García-Zubía and Gustavo R. Alves**

University of Deusto, Spain, and ISEP Porto, Portugal

- **Raphael Rohde**

Manager Technology Development, PHOENIX CONTACT GmbH & Co. KG

- **Krishna Vedula**

Executive Director, Indo Universal Collaboration for Engineering Education (IUCEE)

- **Gabriel Xiao-Guang Yue**

Rector Advisor of European University Cyprus and College Advisor of RICE, RMUTR, Thailand

- **Mark Easley**

University Marketing Manager and MCU Applications Specialist at Texas Instruments

It was in 2004 when we started this conference series in Villach, Austria, together with some visionary colleagues and friends from around the world. When we started our REV endeavor, the Internet was just 10 years old! Since then, the situation regarding online engineering and virtual instrumentation has radically changed. Both are today typical working areas of most of the engineers and are intrinsically tied to

- Internet of Things
- Industry 4.0 and Industrial Internet of Things
- Cloud Technologies
- Data Science
- Cross and Mixed Reality
- Remote Working Environments
- Online & Biomedical Engineering

to name only a few.

With our conference in 2004, we already tried to focus on the upcoming use of the Internet for engineering tasks and the opportunities as well as challenges around it. And as we can see today, it was the right decision.

The REV 2021 Conference takes up the following topics in its variety and discusses the state-of-the-art and future trends under the global theme “Cross Reality and Data Science in Engineering”:

- Applications and Experiences
- Artificial Intelligence
- Augmented and Mixed Reality
- Big Data
- Biomedical Engineering
- Cyber Physical System
- Cyber Security

- Collaborative Work in Virtual Environments
- Data Science
- Evaluation of Online Labs
- Human Machine Interaction and Usability
- Internet of Things and Industrial IoT
- Industry 4.0
- M2M Concepts
- Networking, Edge and Cloud Technology
- Online Engineering
- Process Visualization and Virtual Instrumentation
- Remote Control and Measurements
- Remote and Crowd Sensing
- Smart Objects
- Smart World (City, Buildings, Home, etc.)
- Society 4.0 (Impact of COVID on Engineering Education)
- Standards and Standardization Proposals
- Teleservice and Telerobotics
- Telerobotics and Telepresence
- Teleworking Environments
- Virtual and Remote Laboratories

Special thematic tracks have been held on the following topics:

- Non-traditional Labs and Lab Networks in the IoT and Industry 4.0 Domain
- IoT—Smart Materials and Systems
- Biomedical Engineering and Computing

Submission types have been accepted:

- Full Paper, Short Paper
- Work in Progress, Poster
- Special Sessions
- Workshops, Tutorials

All contributions were subject to a double-blind review. The review process was extremely competitive. We had to review near to 200 submissions. A team of over 90 program committee members and reviewers did this terrific job. Our special thanks go to all of them.

Due to the time and conference schedule restrictions, we could finally accept only the best 65 submissions for presentation or demonstration. The conference had over 140 participants from 29 countries from all continents.

We thank our Estonian colleagues from the Technical University of Tallinn and Videal Productions OÜ for conducting the online conference.

Always Sebastian Schreiter did an excellent job to edit this book.
REV2022 will be held at British University of Egypt in Cairo.

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