

Special Issue for I²MTC 2020

THE 37th IEEE International Instrumentation and Measurement Conference (I²MTC) was planned to be held in Dubrovnik, Croatia, one of the most prominent destinations in the Mediterranean Sea and UNESCO World Heritage site since 1979. I²MTC is the flagship conference of the IEEE Instrumentation and Measurement Society that is dedicated to advances in measurement methodologies, measurement systems, instrumentation, and sensors in all areas of science and technology. The conference has been held every year since 1986 across the globe bringing together academic and industrial communities in discussions on a wide spectrum of research results and developments with applications in current industrial technology. Strong technical programs, accompanying social events, old and newly acquired friends, and life-long education opportunities provide strong reasons to attend the conference every year.

This strong and dedicated community proved itself when our lives abruptly changed in February 2020 amid the final preparations for I²MTC 2020. While many conferences were being postponed or cancelled, the I²MTC organizing team managed to transfer the conference into the remote attendance mode, and the community responded heartily by sticking to the conference, delivering online presentations, and creating a discussion forum.

The I²MTC 2020 theme “Technology advancement through strong foundation and persistent innovation” reflects the often-neglected fact that only innovation built upon thorough engineering knowledge and education can advance and enrich the world we live in. In total, 568 papers went through the review process, and 405 papers were included in the technical program and presented remotely, with an acceptance rate of 71%. The program consisted of ten tutorials, 37 regular sessions, and 15 special sessions, which traditionally foster in-depth discussions on specific topics. All of this would have been impossible without efforts of 34 associate technical program chairs, special sessions organizers, and 372 reviewers.

The conference continued its traditional TIM@I²MTC session and late results session, both providing the opportunity to the authors to disseminate their papers already published in the Transactions or very recent findings. A number of new initiatives were started but sadly halted when the conference went virtual. One of them was a Demo Session that would provide an intriguing opportunity for researchers to present live demonstrations of their results. The other initiative was

I²MTC Open Day allowing high school students to attend the conference sessions and present their projects. In addition, the Engineering Heritage exhibition was planned devoted to innovators and engineers who were born or worked in Croatia.

This Special Issue of the IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT presents an overview of the conference topics through a small number of presented papers that their authors technically extended beyond the conference proceedings version and submitted for consideration for inclusion into the journal. In total, 98 papers were submitted, and of these, 50 were accepted for this issue. An overall 51% of the submitted papers were accepted, with the highest acceptance ratio since 2011 (see Fig. 1) and an increasing rate in the last years.

The contributions to this Special Issue stem from several broad research areas in the field of instrumentation and measurement. Specifically, nine papers discuss applications in the energy and power industry. Eight papers are focused on the design and experimental characterization of circuits and systems for diverse applications. Seven papers investigate the adoption of signal and image processing algorithms as a fundamental part of measurement methods or instruments. Six papers are in the field of industrial equipment health monitoring. Six papers deal with the design and characterization of sensors and sensing systems. Five papers investigate concepts of smart sensing, industrial Internet of Things, industrial networking and Industry 4.0. Three papers are on the applications in robotics, automotive, and transportation industry. Two papers discuss the harsh environment operation of measurement systems. Two papers are from the field of medical, biomedical and healthcare systems. Finally, two papers are focused on applications of nondestructive testing and evaluation.

We acknowledge the authors for extending and submitting their papers to the Special Issue. We greatly appreciate the support of the Associate Editors and Reviewers who voluntarily dedicated their time and effort to ensure high quality of the papers in this issue through a rigorous and timely review process. A special thank goes to the Editor-in-Chief, Prof. Shervin Shirmohammadi, who has the overall responsibility for the journal and to Reta Wehmeier for her assistance during the Special Issue development process. It was our honour to serve as Guest Editors of the Special Issue dedicated to the I²MTC 2020.

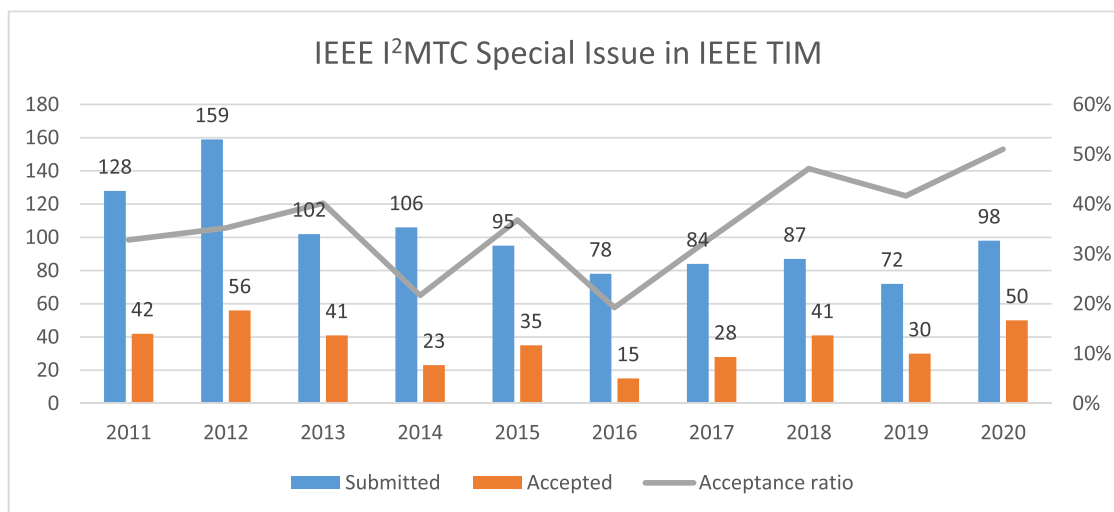


Fig. 1. Submitted and accepted I²MTC extended papers from 2011 to 2020.

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Dr. Rapuano is also the Member-at-Large of the Administrative Committee, the Vice President for Education of the IEEE Instrumentation and Measurement Society (IMS), the Chair of IEEE IMS TC-25, the Sub-Committee Chair of IEEE IMS TC-10, and the Chair of the IEEE Italy Section. In 2008, he received the Outstanding Young Engineer Award from the IEEE IMS and in 2020 the Distinguished Service Award from the IEEE Italy Section. He has been twice the General Co-Chair of the IEEE International Symposium on Medical Measurements and Applications (MeMeA), several times the TPC Co-Chair of IEEE International Instrumentation and Measurement Technology Conference (I2MTC) and MeMeA, and the Co-Guest Editor of IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT (TIM) Special Issues in those conferences.



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Dr. Van Moer was a recipient of the 2006 Outstanding Young Engineer Award from the IEEE Instrumentation and Measurement Society. In 2012, she was elected as a member of the Administrative Committee of the IEEE Instrumentation and Measurement Society for a four-year term, where she has served as the VP of publications. In 2019, she was re-elected as a member of the Administrative Committee of the IEEE Instrumentation and Measurement Society for a four-year term. In 2013, she received the Faculty Course Development Grant of the

IEEE Instrumentation and Measurement Society. She has been the Technical Program Co-Chair of several IEEE International Instrumentation and Measurement conferences as well as the Co-Guest Editor of several IEEE International Instrumentation and Measurement Technology Conference (I2MTC) Special Issues. She was multiple times the recipient of the Outstanding Associate Editor Recognition. From 2007 till 2017, she had been an Associate Editor of the IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT. From 2010 till 2012, she was an Associate Editor of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. From 2014 till 2019, she was the Editor-in-Chief of *IEEE Instrumentation and Measurement Magazine*.