Guest Editorial

ON May 20, 2019, we celebrated World Metrology Day and correspondingly opened the 26th Annual IEEE International Instrumentation and Measurement Technology Conference (I^2MTC) in Auckland, New Zealand. Ranked within the top 3 in 2019 as the world's most liveable cities by Mercer Quality Living Survey, Auckland is a vibrant city, rich with culture and history. It is New Zealand's major economic and financial center with over a third of the nation's population residing here.

Between May 20–23, 2019, a total of 426 registered attendees from Europe, Asia, U.S./Canada, Middle East, and South America attended a rich technical program consisting of 3 keynotes from eminent scientists, 16 tutorials, 2 industry tutorials, 31 oral presentation sessions, and 3 poster sessions. The oral presentation sessions included 13 special sessions, a minisymposium on SI for the 21st Century, and a Sensors and Measurement Student Contest co-organized with the IEEE Sensors Council.

The theme of the 2019 I^2MTC was "The Lords of the IMS: Expanding the Frontiers of Metrology Innovations," and as such, a strict review process supported by 30 associate technical program chairs, 3 special session co-chairs, and over 230 reviewers was conducted to ensure close alignment with the conference theme. Out of 522 submissions, 358 papers were accepted for presentation at the conference.

Following the conference, a total of 72 papers were extended from their conference proceedings and submitted for consideration for inclusion into the Special Issue of the IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT (TIM). Of these, 30 papers have been accepted for this Special Issue, presenting the latest metrology innovations in the context of instrumentation and measurement. We greatly appreciate the support of the IEEE TIM Associate Editors and Reviewers who voluntarily dedicate their time and efforts in supporting the rigorous review process and strict review timelines, thus ensuring that the papers in this Special Issue are of high quality and interest to our community. We are honored to be the Guest Editors of this Special Issue and would like to especially thank the Editor-in-Chief, Prof. Shervin Shirmohammadi, for this opportunity.

ANDREW J. TABERNER
Department of Engineering Science
Auckland Bioengineering Institute
The University of Auckland
Auckland 1010, New Zealand

MELANIE OOI
School of Engineering
The University of Waikato
Hamilton 3240, New Zealand

VINCENZO PIURI
Department of Computer Science
University of Milan
20133 Milan, Italy

Andrew J. Taberner received the Ph.D. degree in physics from The University of Waikato, Hamilton, New Zealand, in 1999.

He is currently a Professor with the Auckland Bioengineering Institute, The University of Auckland, Auckland, New Zealand. He is also a Co-Founder of Portal Instruments, Boston, MA, USA, a Boston-based medical device company that has an exclusive world-wide license to commercialize his jet-injection intellectual property portfolio. His teaching is centered on the principles and methods of bioinstrumentation and measurement and forms part of his University's B.E. degree (Hons.) in biomedical engineering. He leads a team of researchers in his Bioinstrumentation Laboratory in novel instrumentation design, construction, and development. He has supervised 32 Ph.D., 18 M.E., and 66 honours students. He is the author of more than 150 refereed scientific articles in journals, books, and published conference proceedings, and 120 conference abstracts, and an inventor of 29 granted U.S., European, and other patents. His current research interest includes the development of scientific and medical instruments for measuring tissue structure and function, and needle-free drug delivery.

Dr. Taberner received the Innovation Excellence in Research Award at the 2014 New Zealand Innovators Awards. The quality of his teaching has been recognized by five Students' Choice Top-Teacher awards and the Sustained Excellence in Teaching Award. He was a recipient of the James Cook Fellowship from the Royal Society of New Zealand. He is a Distinguished Lecturer of the IEEE Instrumentation and Measurement Society, the Chair of the New Zealand Chapter of the IEEE Instrumentation and Measurement Society, an Editor of the *IEEE Pulse Magazine*, and a member and a Reviewer of the IEEE Engineering in Medicine and Biology Society.

Digital Object Identifier 10.1109/TIM.2020.2979538

Melanie Ooi is currently an Associate Professor with the School of Engineering, University of Waikato, Hamilton, New Zealand. Her research in electronics test technologies has led to the proposal of new testing standards and methodologies for the semiconductor industry. In addition to electronics testing, she has also proposed new measurement uncertainty theories and frameworks with application to medical measurement, and structural and mechanical systems.

Prof. Ooi is the youngest female fellow elected by the Institution of Engineering and Technology, U.K., a member of the IEEE Public Visibility Committee, and an ADCOM Member of the IEEE Instrumentation and Measurement Society. She has received numerous national and international awards, such as the 2019 Rutherford Discovery Fellowship from the New Zealand Royal Society, the 2014 Excellence Award from the International Education Association of Australia, the Outstanding Engineering of the Year 2014, the 2012 Faculty Course Development Award from the IEEE Instrumentation and Measurement Society, and the 2011 Citation for Outstanding Contributions to Student Learning from the Australian Learning and Teaching Council. Her work is adopted as a part of the South African National Accreditation System guidelines document TG 50-02.

Vincenzo Piuri (Fellow, IEEE) received the Ph.D. degree in computer engineering from the Politecnico di Milano, Milan, Italy, in 1989.

He has been a Full Professor in computer engineering with the Università degli Studi di Milano, Milan, since 2000. He has been an Associate Professor with the Politecnico di Milano and a Visiting Professor with The University of Texas at Austin, Austin, TX, USA, and George Mason University, Fairfax, VA, USA. He is an Honorary Professor at Óbuda University, Budapest, Hungary; the Guangdong University of Petrochemical Technology, Maoming, China; Northeastern University, Shenyang, China; the Muroran Institute of Technology, Muroran, Japan; and Amity University, Noida, India. His main research interests are in artificial intelligence, computational intelligence, intelligent systems, machine learning, pattern analysis and recognition, signal and image processing, biometrics, intelligent measurement systems, industrial applications, digital processing architectures, fault tolerance, dependability, and cloud computing infrastructures. Original results have been published in more than 400 papers in international journals, proceedings of international conferences, books, and book chapters.

Dr. Piuri received the IEEE Instrumentation and Measurement Society Technical Award in 2002. He is a Distinguished Scientist of the Association for Computing Machinery and a Senior Member of INNS. He is the President of the IEEE Systems Council for the term of 2010–2021. He was the Vice President of the IEEE Technical Activities in 2015, the President of the IEEE Computational Intelligence Society, the Vice President for Education of the IEEE Biometrics Council, the Vice President for Publications of the IEEE Instrumentation and Measurement Society and the IEEE Systems Council, and the Vice President for Membership of the IEEE Computational Intelligence Society. He was the Editor-in-Chief of the IEEE SYSTEMS JOURNAL from 2013 to 2019. He has been an Associate Editor of the IEEE TRANSACTIONS ON COMPUTERS, the IEEE TRANSACTIONS ON NEURAL NETWORKS, the IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, and IEEE ACCESS. He is an Associate Editor of the IEEE TRANSACTIONS ON CLOUD COMPUTING.