Guest Editorial

Special Section on the 2008 Advanced Methods for Uncertainty Estimation in Measurement Workshop

The fourth edition of the workshop on Advanced Methods for Uncertainty Estimation in Measurement (AMUEM), which was organized by the IEEE Instrumentation and Measurement Society, was held in Sardagna, Trento, Italy, on July 21–22, 2008. As in the previous editions, the specific aim of the workshop was to analyze the most advanced methods and tools for the definition and evaluation of uncertainty in measurement through an informal and broad discussion about different approaches and results. In fact, despite the methods and standards available, the achievement of a correct expression and evaluation of uncertainty in measurement is one of the most challenging tasks for scientists and practitioners in the field of instrumentation and measurement.

It is well known and universally accepted that a measurement result provided without specifying the associated uncertainty value does not carry any information, so it is meaningless and devoid of practical utility. On the other hand, the demands for accurate measurement in emerging technical or management-oriented applications, as well as the always wider use of novel measurement methods and of complex distributed instruments, require a deep investigation of the available methods and tools for uncertainty evaluation.

As a consequence, inside the Instrumentation and Measurement community, there is an increasing interest for new approaches enabling a correct but possibly simple expression and evaluation of measurement uncertainty. AMUEM is an open forum organized by the IEEE Instrumentation and Measurement Society to provide a highly qualified answer to this need. Twenty-six manuscripts were submitted to the workshop and evaluated by three independent reviewers. As a result, 20 papers were accepted for the conference and discussed among the participants. Some of them have technically been extended beyond the conference version to qualify for the submission to this Special Section of the IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT. After a rigorous reviewing process, five papers were approved for publication in this Special Section. They highlight and extend several of the more significant results presented at the workshop. I hope that the reader will find these papers informative and valuable. Above all, I hope that they might stimulate further investigations in this important and fundamental field of the measurement science and in all the related applications.

At last, I would like to thank the authors of all of the submitted papers for their effort in preparing the manuscripts and in doing revisions, as suggested by the reviewers, to increase the quality of their work. I would also like to thank the valuable and qualified reviewers, whose dedication and work assure the high quality standards of these TRANSACTIONS, and Editor-in-Chief Prof. R. Zoughi for having agreed to publish this Special Section. Special thanks is given to C. Ingelin for her prompt support in handling the whole editorial process. Finally, a particular thank you is also given to Prof. A. Ferrero for his precious and invaluable support in the organization of this workshop.

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Dario Petri (M’92–SM’05–F’09) received the M.Sc. (*summa cum laude*) and Ph.D. degrees in electronics engineering from the University of Padova, Padova, Italy, in 1986 and 1990, respectively.

From 1990 to 1992, he was an Assistant Professor with the Department of Electronics and Information Engineering, University of Padova. In 1992, he joined the University of Perugia, Perugia, Italy, as an Associate Professor, where he was the Chairperson of the Undergraduate and Graduate Degree Study Programs in Information Engineering in 1999. In the same year, he was elevated to full professorship of measurement and electronic instrumentation. In 2002, he joined the Department of Information Engineering and Computer Science, University of Trento, Trento, Italy, where he was the Chairperson of the International Ph.D. School in Information and Communication Technology from 2004 to 2007. He is currently the Chairperson of the Undergraduate and Graduate Degree Study Programs in Information Engineering of the University of Trento. He is the author or coauthor of almost 200 papers published in international journals or proceedings of peer-reviewed international conferences. His research interests include uncertainty evaluation methods, data acquisition systems design and testing, embedded systems design and characterization, statistical inference methods, and application of digital signal processing to measurement problems.

Dr. Petri is an Associate Editor for the *IEEE Transactions on Instrumentation and Measurement*. He has been chairing the Italy Chapter of the IEEE Instrumentation and Measurement Society since 2006.