



Editorial to selected papers from IMEKO TC1-TC7-TC13-TC18 joint symposium and MATHMET workshop 2022, 2nd part

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Dear Readers,

This issue includes the second part of the selection of papers presented at the IMEKO TC1-TC7-TC13-TC18 joint symposium and MATHMET (European Metrology Network for Mathematics and Statistics) workshop “*Cutting-edge measurement science for the future*” held in Porto in August 2022. As for the first part [1], all these papers followed an Acta IMEKO regular peer-review process before being included into this issue.

I have the pleasure to introduce two first papers devoted to the fundamental and historical aspects of measurement science. In their paper “*Probability theory as a logic for modelling the measurement process*” [2], Giovanni Rossi, Francesco Crenna and Marta Berardengo face a fundamental aspect of measurement with an audacious proposal on the nature of probability in the context of measurement modelling. In this contribution they show that probability can be interpreted as a logic for developing models of measurement and by the way they open multiple doors on future advances in measurement modelling.

In “*Metrology in the early days of Social Sciences*” [3], Clara Monteiro Vieira and Elisabeth Costa Monteiro explore the fundamental aspects of the measurement methods proposed more than a century ago by two founding authors of sociology as a scientific field. They especially seek to identify the possible connections between these preliminary sociological approaches and the current metrological conceptions.

The identification of human activity is a crucial topic. Pawel Mazurek and Szymon Kruszewski present in their paper “*Applicability of multiple impulse-radar sensors for the recognition of a person's action*” [4] a highly accurate non-intrusive sensor for the monitoring of elderly persons.

Artificial intelligence is a major topic of interest related to multiple fields, and it also concerns measurement fields. A first paper presents the results of a study to classify masonry debris by different machine learning methods. Elske Linß, Jurij Walz and Carsten Könke investigate in their paper, “*Image analysis for*

the sorting of brick and masonry waste using machine learning methods” [5], the performance of several AI methods (SVM, MLP and k-NN) on images of masonry debris.

A second paper, “*A low-cost table-top robot platform for measurement science education in robotics and artificial intelligence*” [6], proposed by Hubert Zangl, Narendiran Anandan and Ahmed Kafrana, is focused on the diffusion of the knowledge in measurement field by the use of dedicated robotic platforms and their digital twins.

This second selection of selected papers also includes two contributions related to the European Metrology Network for Mathematics and Statistics MATHMET, a network including a large number of European national metrology institutes and that aims at fostering the field of mathematical and statistical applications for measurement science in Europe. The first one, by Francesca R. Pennechi and Peter M. Harris, is a technical note that concerns the Mathmet ‘measurement uncertainty activity’. It provides an analysis of the dissemination of MU training, and a precise report on the progress to undertake surveys of existing training courses on MU: “*Mathmet Measurement Uncertainty Training activity – Overview of courses, software, and classroom examples*” [7]. The second one, “*Case studies for the MATHMET Quality Management System at VSL, the Dutch National Metrology Institute*” [8] by Gertjan Kok presents an early test on two pieces of metrological software, on mathematical reference datasets, and on a set of mathematical guidelines, of the MATHMET Quality Management System previously presented by Lines (see [9]).

I hope you will enjoy your reading.

Eric Benoit
Section Editor

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