Introduction to the ACTA IMEKO issue devoted to selected papers presented in the 14th Joint International IMEKO TC1 + TC7 + TC13 Symposium

Gerhard Linß

Ilmenau University of Technology, Department of Quality Assurance and Industrial Image Processing, Faculty of Mechanical Engineering, Gustav-Kirchhoff-Platz 2, 98693 Ilmenau, Germany

ABSTRACT
This editorial article is a brief introduction to the ACTA IMEKO issue devoted to selected papers presented in the 14th Joint International IMEKO TC1 + TC7 + TC13 Symposium "Intelligent Quality Measurements - Theory, Education and Training". This Symposium took place in Jena, Germany from August 31st to September 2nd 2011 in conjunction with the 56th IWK Ilmenau University of Technology and the 11th SpectroNet Collaboration Forum.

Corresponding author: Gerhard Linß, e-mail: gerhard.linss@tu-ilmenau.de

1. INTRODUCTION

The 14th Joint International IMEKO TC1 + TC7 + TC13 Symposium, which took place in Jena, Germany, had the title "Intelligent Quality Measurements – Theory, Education and Training". The 14th Joint International IMEKO TC1 + TC7 + TC13 Symposium was intended to reflect innovative solutions for intelligent quality measurements in both theory and application. International researchers from 12 countries presented their exciting work in fundamentals of measurement science, mathematical models in measurement, new education and training methods and applications for intelligent quality measurements, for measurements in medicine and measurements in biology. The symposium aimed to bring researchers and developers from various fields together to share their new thoughts, findings and applications. The response from the academic community has been great, with more than 70 submissions received. The authors have contributed towards new knowledge and understanding, and have provided research results and applications that will be of important value to researchers, students and industry alike. The involved competence network SpectroNet Green Vision connected specialists for visual quality control with digital image processing and spectral imaging in research and industry, nutrition and health, transportation, environment, security and administration (www.spectronet.de). Additionally the 56th International Scientific Colloquium, which was held at the Ilmenau University of Technology from 12th to 16th September 2011 has had an unbroken tradition of more than 50 years and is the "flagship" event of the university, having an excellent reputation. In 2011 the International Scientific Colloquium was again organised by the Faculty of Mechanical Engineering. The title of the conference is "Innovation in Mechanical Engineering – Shaping the Future" (www.iwk.tu-ilmenau.de).

We are grateful to all the contributors who presented their valuable work to the research community in Jena 2011.

The journal papers presented in this ACTA IMEKO issue were chosen by the IMEKO TC1 + TC7 + TC13 Board from the papers which were presented at the 14th IMEKO TC1 + TC7 + TC13 Symposium. After the IMEKO Symposium in Jena more than 17 authors were recommended for providing an updated and extended version of their Jena papers for publication in a special issue of the journal Measurement or an issue in ACTA IMEKO in February 2012. 12 authors accepted this invitation and papers begun arriving us in spring of 2012. In the next step the received extended papers underwent a normal reviewing process. 14 reviewers were involved in the reviewing process and helped to optimize the final manuscripts with constructive references and recommendations.

At the result we had seven extended and positive ranked papers, which show a significant update to take into account progress since the Symposium submission and the discussions at the Symposium in Jena. Four of the positive ranked papers discuss the role of mathematical models in measurement and so these papers are published in the Measurement journal (2013). The other three positive ranked papers discuss new education and training methods and applications for intelligent quality measurements and on this thematic basis these papers are published in this issue of ACTA IMEKO.

2. ABOUT TC1, TC7 AND TC13

TC1 is concerned with all matters of education and training of professional scientists and engineers for measurement and instrumentation including curricula, syllabuses and methods of teaching as well as the nature and scope of measurement and instrumentation as an academic discipline. TC1 of IMEKO was established in 1967 (www.imeko.org/tc1).

TC7, the Committee established in 1973 under the name Measurement Theory and in 1993 redesignated as Measurement Science, is concerned with the development of measurement science (www.imeko.org/tc7).

TC13 is concerned with measurement of whole body, organ and cellular function, medical imaging and medical information systems (www.imeko.org/tc13).

3. THE JOURNAL PAPERS

The three selected journal papers discuss several applications for intelligent quality measurements in highly topical industrial fields, new education and training methods and the combination of image processing with classical quality assurance methods.

The focus of paper [1] lays on the realization, how to combine image processing with classical quality assurance methods. Two industrial applications were used to describe the problem to gain the importance of this combination. Very often the technical realization of sensor systems and data processing are completely separated to quality inspection tasks. So special trainings as well as special parts in the lectures were developed and structured for closing this known gap.

Paper [2] discusses two analysis activities in the construction material industry, which could be solved by intelligent image processing algorithms for saving time and costs. One of the tasks was the optical identification of recycled aggregates of construction and demolition waste (CDW) as basis of an innovative sorting method on the field of processing of CDW and another task was the optical analysis of samples from mineral aggregates.

Paper [3] discusses new problems of inspection planning arising from the improvement in measurement technology. The paper describes essential demands, ideas and conceptual approaches to multistructured quality inspections. The background is the fact that the development and control of more and more complex and extensive technical systems yields to measurement-technology requirements in an increasing degree.

4. CONCLUSIONS

We are grateful to all the contributors who provided their extended papers for this issue of ACTA IMEKO and the issue of Measurement. It was a great pleasure to act as guest editor for this issue of ACTA IMEKO. Particularly I must thank the authors, the reviewers for contribution, evaluation and recommendation and specially Paul Regtien for his support, help and copyediting and publishing process.

REFERENCES

[1] M. Rosenberger, M. Schellhorn, G. Linß, "New education strategy in quality measurement technique with image processing technologies - chances, applications and realisation", ACTA IMEKO, vol. 2 (2013), no. 1, pp. 56-60.
[2] K. Anding, D. Garten, E. Linß, "Application of Intelligent Image Processing in the Construction Material Industry", ACTA IMEKO, vol. 2 (2013), no. 1, pp. 61-73.
[3] K. Weissensee, "New demands on inspection planning and quality testing for micro- and nanostructured components", ACTA IMEKO, vol. 2 (2013), no. 1, pp. 74-78.