
Editorial

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Biographical notes: S.S. Pande is a Professor of Mechanical Engineering at Indian Institute of Technology, Bombay, India. He was a Visiting Professor at the University of Cincinnati, USA. His research interests include computer aided design and manufacturing (CAD/CAM) with focus on product modelling, algorithms for rapid prototyping, CNC machining and computational metrology, artificial intelligence techniques, manufacturing process modelling and internet-based collaborative product development. He has published 140 research papers in various referred International Journals and Conferences and has authored a book titled Computer Graphics and Product Modelling for CAD/CAM.

V.K. Jain has done his MTech and PhD from University of Roorkee. He has ~40 years of teaching and research experience. He has served as a Visiting Professor at the University of California at Berkeley (USA) and University of Nebraska at Lincoln (USA). Presently, he is Emeritus Fellow at Indian Institute of Technology Kanpur. He has around 300+ publications to his credit. He has written/edited seven books. He has various research areas of interest, viz. advanced machining processes (ECM, EDM, AFM, MAF, MRAF and others), machining of advanced engineering materials, shear strain acceleration phenomenon in metal cutting, and CAPP.

Product development activities worldwide are facing newer challenges due to stringent demands on product quality and reliability. Inspection plays a key role in this scenario to ensure conformance of the product tolerances to the design specifications. Traditionally inspection focuses on dimensional measurement using gages, comparators and dedicated instruments for complex parts like gears and splines. With the advent of digital instruments during the last three decades or so, newer research paradigms have been globally set in terms of computational algorithms, inspection procedures and associated standards.

Keeping this trend in view, researchers from Premier Academic Institutions and Research Laboratories in India have been steadily contributing to the area of *Metrology, Inspection and Quality Engineering*. This special issue aims to present the state-of-the-art research being carried out in India.

For the past four decades, All India Manufacturing Technology Design and Research (AIMTDR) conference is being organised bi-annually in India that provides a forum for the researchers to present their contemporary work. The recent one was 4th International and 25th All India Manufacturing Technology Design and Research (AIMTDR) conference held at Jadavpur University, Kolkata, during 14–16 December, 2012. Enhanced versions of seven research papers presented at this conference which constitute about 5% of the total published papers have been selected for this special issue. This special issue broadly focuses on the areas like algorithms for computational metrology, vision-based inspection, calibration of precision metrology instruments, reliability-based condition monitoring and process control/optimisation using statistical techniques.

Rajamohan and Shunmugam report an adaptive sampling strategy based on dominant isoparametric lines for the inspection of free form surfaces on continuous scanning coordinate measuring machine (CMM). The proposed strategy is found to optimise the sample size in terms of fewer scan lines. *Lawrence and Ramamoorthy* propose a fractal-based statistical model for the characterisation of surface topography of honed surfaces from stylus profile data. Fractal parameters offer a new prospect of characterisation of surface topography to avoid parameter rash. *Dutta et al.* employed a miniature interferometer to measure the position and angular errors of precision metrological instruments and recommend suitable calibration parameters. *Kumar et al.* report a vision-based approach for the identification of wear of a spur gear using reverse engineering technique. *Biswas et al.* carried out risk and hazard analysis of a real-life industrial system through reliability-based condition monitoring and suggest approach for preventive maintenance. *Chowdhury et al.* report measurement system analysis (MSA) using ANOVA technique to assess if the system is within the acceptable limits to measure the production data of a process. Planning experiments using Taguchi techniques, *Biswas et al.* recommend optimum conditions of process parameters for arc welding process to get superior weld quality.

We hope that the papers presented in this issue will be useful to both academic researchers as well as practicing engineers.

The Guest Editors are very much thankful to Professor V.C. Venkatesh, the Honorary Editor-in-Chief of *IJPTech* for his valuable suggestions and guidance during the process of bringing out this special issue on *Metrology, Inspection and Quality Engineering*. Finally, we thank the reviewers for their dedicated support in the timely review of the papers.