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 manufacturing process modelling, simulation and optimisation, algorithms for additive manufacturing, CNC machining and computational metrology, Artificial Intelligence techniques and Internet based collaborative product development. He has published about 140 research papers in international journals and peer reviewed Conferences and has authored a book titled *Computer Graphics and Product Modeling for CAD/CAM*.

Ramesh Singh is an Associate Professor in the Department of Mechanical Engineering at Indian Institute of Technology Bombay. He received his PhD from Georgia Institute of Technology, MS from Tufts University and Bachelors from Birla Institute of Technology, Ranchi. His research interests are flexible fibre laser based materials processing, ultra-high speed micromachining, super-finishing and finite element modelling of manufacturing processes. He has worked on development of laser-assisted mechanical micromachining process and machine which was highlighted by Industry Week magazine. He has very active association with Indian Industry and has consulted and collaborated with NTPC, CEAT, PCI Ltd, Axis Microtools, Interface Design Associates, KGK diamonds to name a few. He has published 110 international journal and peer-reviewed conference publications. He has published four book chapters and filed five patents. He has graduated 55 Masters and five PhD students. He received the prestigious SwarnaJayanti Fellowship in 2015 for sustainable subtractive and additive manufacturing at micro-scale and outstanding paper award in 2016 North American Manufacturing Research Conference.

Product development activities worldwide are focusing upon the production of complex miniature features in micro-sized parts used in automotive, aerospace, electronics and bio medical industries. The focus of R&D is thus, shifting to newer manufacturing processes based on subtractive and additive techniques to produce miniature parts with greater precision, accuracy and reliability. Process modelling and simulation play a key role in this scenario as they provide a means to understand the physics behind the processes and suggest directions to optimise them.

This special issue of *International Journal of Precision Technology* aims to present the state-of-the-art research being carried out in these areas.

Enhanced versions of six research papers presented at the *9th International Conference on Precision, Meso, Micro and Nano Engineering (COPEN)* held at Indian Institute of Technology, Bombay, India during 10–12 December, 2015 have been selected for the special issue. The papers broadly focus on error modelling of precision CNC machines, online tool life prediction, process modelling and experimental studies on micro machining, high speed turning, plasma coating and additive manufacturing.

Vairamuthu et al. developed a mathematical model considering the geometric and kinematic errors to predict the accuracy of a CNC cylindrical grinding machine. Experimental validation and sensitivity analysis was carried out to identify critical elements and suggest ways to enhance precision and accuracy of the machine. Mishra et al. compared Fast Fourier (FFT) and wavelet transform techniques to assess their suitability for the prediction of tool wear for online tool condition monitoring. Superiority of wavelet transforms was demonstrated for real time data. Anasane and Bhattacharyya carried out experimental investigations on electro chemical micro machining (ECMM) process and recommended optimum ranges of process parameters such as machining voltage, pulse frequency, duty ratio and micro tool feed for improving the accuracy of the micro slots produced. A sustainability assessment model for the high speed turning of Inconel 718 was proposed by Kadam and Pawade, suggesting that the use of water vapour as the coolant and lubricant is quite promising for eco-friendly green machining. A non-contact free form surface finishing process was reported by Dev et al. to obtain ultra-fine surface finish and eliminate surface and sub surface damages generated by the previous processes. Kelley et al. carried out studies to characterise the high cycle fatigue behaviour of Inconel 718 specimen produced by direct metal laser sintering (DMLS) additive manufacturing (AM) process. With optimal surface quality and build orientation, the fatigue behaviour of DMLS produced Inconel 718 was found comparable to that of traditionally processed material.

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

We are grateful to Professor V.K. Jain, Editor-in-Chief, *International Journal of Precision Technology* for his valuable suggestions and guidance during the process of bringing out this special issue. We sincerely thank the authors for submitting their research work for this issue. We are grateful to the reviewers for the timely review of the papers and the suggestions on the technical content. Finally, we sincerely thank the Inderscience publishing team for their professional support during the preparation of this issue.