

Special Issue on

Vibration Assisted Machining

Guest Editors: Dr. Dehong Huo and Professor Kai Cheng

Precision components are increasingly in demand for various engineering industries, such as biomedical engineering, MEMS, electro-optics, aerospace and communications. In addition to the aims of achieving tight tolerances and high quality surface finishes, many applications also require the use of hard and brittle materials such as optical glass and technical ceramics, owing to their superior physical, mechanical, optical, and electronic properties. However, due to their high hardness and usually low fracture toughness, the processing and fabrication of those hard-to-machine materials have always been a challenge. Furthermore, aeronautic or aerospace alloys through delicate heat treatment and composites materials have also imposed the challenge on precision machining in a similar manner.

Continuous efforts to enhance machining performance have revealed that machining quality can be improved by high frequency vibration of the tool or workpiece. Vibration assisted machining (VAM) was first introduced in the late 1950s, and has been applied in several machining processes, including both traditional machining (turning, drilling, grinding and more recently milling) and non-traditional machining (laser machining, electro-discharge machining, and electro-chemical machining). Reported benefits of VAM include: reductions in machining forces; improved surface finish and form accuracy; suppression of burr formation; reduction of tool wear and extension of tool life, albeit there are still many gaps for technological improvement and the scopes for deeper and better scientific exploration and understanding.

The aim of collating this special issue is to provide a forum for researchers and practitioners to review the state-of-the-art in the field, and to identify possible directions for future developments. Original contributions should discuss the development and application of vibration assisted machining, and emphasis will be on the knowledge and insights accumulated so far, and also on opportunities and implications for the future. Possible topics, within this scope, include but are not limited to:

- Vibration assisted traditional processes (turning, milling, drilling, and grinding)
- Vibration assisted electro-discharge machining
- Vibration assisted electro-chemical machining
- Vibration assisted laser machining
- Rotary ultrasonic machining
- Development of resonant or non-resonant vibration platform for VAM
- Kinematic modelling of VAM
- Machining dynamics in VAM
- Cutting mechanics and tribological issues
- Tool wear and tool life aspects
- Surface texture generation through VAM
- Industrial applications of VAM

Contributions will be reviewed by at least two referees. The manuscripts should normally be within 25 pages of A4 paper, printed on one side only and double-spaced, and inclusive of figures and tables. Interested authors are welcome to send in their tentative titles and abstracts through email. Full electronic manuscripts (MS-Word, or PDF file) should be submitted via JMES on-line system by **March 18, 2018**. They must be prepared using the [Instructions to Authors of the Proceedings of the IMechE](#).

Guest editors:

Dr. Dehong Huo	Professor Kai Cheng
School of Engineering, Newcastle University, Newcastle University Newcastle upon Tyne, NE1 7RU, UK	Department of Mechanical, Aerospace and Civil Engineering, Brunel University London, UB8 3PH, UK
Email: dehong.huo@newcastle.ac.uk	Email: kai.Cheng@brunel.ac.uk
Tel: +44(0)191 208 6230	Tel: +44(0)1895 267255

Important dates:

Express of interest (Title + Abstract + Date) through email	As soon as possible
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Notification of reviews to authors	June 1, 2018
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Final notification and re-reviews	October 31, 2018
Final submission and decision	December 18, 2018
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