Name: Ravinder Singh Joshi

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Year of joining: 2010

Entry No.: 2010MEZ0002

Research Interest(s): Modulation assisted machining; Severe plastic deformation; Sustainable manufacturing systems; CAD/CAM; Neural networks; Genetic Algorithms.

Status: full time

List of Publications

Conferences (Published)

- Joshi, R. S., Singh, H., (2012) "Modulation Assisted Machining: A Way Out for Particulate Production", 4th International and 25th National All India Machine Tool Design and Research (AIMTDR 2012), December 14-16, held at Jadavpur University Kolkata, India.

- Joshi, R. S., Singh, H., (2012) "Deformation in Brass Particulates Produced by Modulation Assisted Machining" The European Powder Diffraction Conference (EPDIC 13), October 28-31, held at Congress Center of MINATEC, Grenoble, France. (Abstract Published).

- Joshi, R. S., Singh, H., (2011) "Piezoelectric Transducer Based Devices for Development of a Sustainable Machining System – A Review", Proceedings of 20th IEEE ISAF-PFM 2011, Vancouver, Canada.

- Joshi, R. S., Kumar, N., (2008) "Setup Planning and operation sequencing using Neural Network and Genetic Algorithm" IEEE International Conference on Information Technology: New Generations (ITNG), April 7-9 held at Las Vegas, Nevada, USA.

- Kumar, N., Joshi, R. S., (2007) "Part Family Formation Using ART Neural Network" International Conference on Applications and Design in Mechanical Engineering, October 25-26, held at University of Perlis Malaysia.

- Kumar, N., Joshi, R. S., (2006) "Feature recognition using Artificial Neural Network" International Conference on Advances in Mechanical Engineering, December 1-3, Baba Banda Singh Bahadur Engineering College Fatehgarh Sahib.

Research Profile

Research Topic: Parametric studies of modulation assisted machining (MAM) and its effect on chip characteristics

Aim of this work is to study the effect of modulation assisted drilling on surface finish cutting forces and tool wear while drilling difficult to machine materials such as stainless steel and super alloys. In MAM controlled vibration of high amplitude and low frequency given to the tool helps in breaking the chip-tool contact during machining. This breakage of tool chip contact further helps in improving contact conditions by proper lubrication of tool chip contact. Surface roughness tester and dynamometer in used to evaluate the surface roughness and cutting forces respectively. For carrying out tool wear study tool maker's microscope and scanning electron microscopy (SEM) is used.

Second aspect of this work is to produce particulates of different size and shape from different materials using Modulation Assisted Machining (MAM). Controlled breakage of chip-tool contact produces the chips as particulate at a rate of frequency of modulation. Size and shape of the particles produced by MAM can be controlled by varying modulation and machining conditions. Morphology of the particulates produced at different conditions is investigated using SEM and Tool maker's microscope. Vickers's microhardness testing is used to study and understand the variation of hardness in bulk brass and chip particulates produced using MAM. Microstructure analysis of bulk brass and chip particulate is carried out on metallurgical microscope. Effect of modulation and machining parameters on deformation level of the chips particulates produced during MAM is also investigated using X-Ray diffraction.

Conference/Workshop attended

Attended "ITNG 2008" conference held at Las Vegas, USA.
Attended "AIMTDR 2012" conference held at Jadavpur University, Kolkata.

Travel Grant

Received travel grant from AICTE for attending "ITNG 2008" conference held at Las Vegas, USA.
Received travel grant from institute for attending "AIMTDR 2012" conference held at Jadavpur University, Kolkata.