

# Ankit Jain

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## Objective

To utilize my research skills in a reputable industry, and perform quality research work in the field of machine tools development, designing, CNC machining, surface modifications, and machine tools applications.

## Doctoral Research

Machine tools (Micro milling, drilling, turning), CNC machining, CAD/CAM, surface characterization, surface texturing using mechanical machine tools and their characterization, Finite element analysis machining module (using Abaqus).

## Skills

- Machine tools; Micro machining;
- Surface texturing using CNC micro milling;
- Machining surface characterization and analysis;
- CNC Programming: Mach 3 (proficient); Fanuc (Proficient)
- Abaqus FEA Machining module (Proficient); Deform 3D (intermediate);
- CAD/CAM: NX Siemens (Proficient); Pro-E (Intermediate)
- ImageJ (Proficient) LATEX (Intermediate), Python (beginner)

## Research Experience (2016 Onwards)

### *1. Designing and fabrication of surface textures on titanium and their functional characterization*

- Development of high speed micro machining center at micro fabrication laboratory at IIT Dhanbad.
- Machining of difficult to cut materials (Titanium and Inconel) and their surface characterization.
- Fabrication of different directional textures on titanium alloys using micro milling and studied surface properties
- Published two high-quality research papers based on experiments and numerical analysis.

## 2. Finite element modeling of machining of titanium alloys for predicting industry-relevant outcomes

- Finite element model for the prediction of cutting forces induced during machining has been developed using Abaqus/CAE.
- Models have been developed for both dry and cryogenic machining conditions and predicted results are validated with experimentally obtained results.
- Developed a mathematical model for prediction of flank wear during machining of titanium alloys.
- Published two high-quality research papers based on FEM using Abaqus.

## Teaching Experience

Worked as Teaching Assistant for four years at the Indian Institute of Technology (ISM), Dhanbad, while pursuing MTech and Ph.D. from 2016 onwards.

## Education

2017 - Ongoing **Ph.D. in Mechanical Engineering**

Title: *Creation of engineered features on Ti alloys and their functional characterization.* [ Guide: Dr. Vivek Bajpai], IIT Dhanbad

2015-2017 **MTech in Mechanical Engineering**

Title: *Finite element modeling of machining of titanium alloys for predicting industrial relevant outcomes.* [ Guide: Dr. Vivek Bajpai], IIT Dhanbad

2010-2014 **B.E. in Mechanical Engineering**

RGPV Bhopal, M.P., India

2009 **Higher Senior Secondary** (Mathematics)

A.V.M. HSS Bhind, M.P.

2007 **High school** (10<sup>th</sup>)

A.V.M. HSS Bhind, M.P.

Degree	Major/Specialization	University/Board	Percentage/CGPA	Division	Year
Ph.D.	Surface texturing / Micro machine tools	IIT (ISM) Dhanbad	NA	NA	Ongoing
MTech	Mechanical Engg. (Manufacturing)	IIT (ISM) Dhanbad	9.31	First	2017
B.E.	Mechanical Engg.	RGPV Bhopal	7.91	First	2014
12 <sup>th</sup>	Science (PCM)	MP Board	87.4	First	2009
10 <sup>th</sup>	Science	MP Board	84.8	First	2007

### **Summer Internship & workshops:**

2013	One month Industrial training at Bharat Heavy Electricals Limited (BHEL)	Bhopal
2016	Two-month internship on finite element codes developed by Abaqus and learned about Machining module (mechanical and Thermal)	IIT Dhanbad
2018	Attended workshop on Abaqus	IIT Dhanbad
2018-2020	Attended several webinars on Abaqus, CAD and CNC machining	Online

### **Activities & Achievements:**

- GATE (An all India technical competitive examination) Qualified several times.
- Obtained Ministry of Human Resource and Development (MHRD), Government of India, Scholarship.
- Obtained TEQIP scholarship during the Masters.
- Obtained DST international support to attend WCMNM 2019 at Raleigh USA.
- Member of ASME student chapter (manufacturing Engineering division).
- Scored 96% in PCM in Senior secondary examination.

### **List of Publications:**

Journals (SCI Indexed):

1. **Jain A.**, Kumari N., Jagdevan S., and Bajpai V., “Surface properties and bacterial behavior of micro conical dimple textured Ti6Al4V surface through micro-milling”, *surfaces & interface* 22 (2020) 100714.
2. **Jain A.**, and Bajpai V., “Mechanical micro-texturing and characterization on Ti6Al4V for the improvement of surface properties”, *Surface & coating technology* 380 (2019) 125087.
3. **Jain, A.**, Kumar, S., Bajpai, V., Park, H. W., “Replacement of Hazard Lubricants by Green Coolant in Machining of Ti6Al4V: A 3D FEM Approach”, *International Journal of Precision Engineering and Manufacturing*, 20, (2019) pp. 1027-1035.
4. **Jain, A.**, Khanna, N and Bajpai, V., “Finite element simulation of machining of Ti-54M titanium alloy for predicting industry-relevant outcomes”, *Measurement*, 29, (2018) pp. 268-276.

Book Chapter:

**Jain, A.** and Bajpai V., “Introduction to high-speed machining (HSM)”, in: *High Speed Mach.*, Elsevier, 2020: pp. 1–25. <https://doi.org/10.1016/B978-0-12-815020-7.00001-1>.

Conference Papers:

1. **Jain A.**, Yatirajula S., and Bajpai V., “Fabrication and characterization of conical micro dimple textures on Ti6Al4V for higher biocompatibility” *Proceedings of the ASME 2020 15th MSEC 2020 University of Cincinnati, Ohio, USA*.
2. **Jain A.**, Bajpai V., “Surface characterization of micro-textured titanium surface fabricated by micro milling” *Conference proceeding of WCMNM 2019 Raleigh NC USA*.
3. **Jain A.**, Lee I., Park H.W., and Bajpai V., “Development of a mathematical model for tool wear in dry machining of Ti6Al4V with coated cemented carbide tool” *proceedings of 10<sup>th</sup> COPEN 2017 Indian Institute of Technology Madras, Chennai India*.

**Personal Details:**

Date of Birth: April 4, 1992  
Gender: Male  
Nationality: Indian  
Languages known: Hindi, English