Dr. Sunny Singhania

Assistant Professor, Department of Foundry and Forge Technology

NIAMT Ranchi

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RESEARCH INTEREST

Machining Dynamics, Experimental Modal Analysis, Machine Tool Design, Digital Manufacturing, Casting and Solidification, Robotics Machining, Smart Manufacturing, Machinery Health Monitoring, Applied Dynamics and Vibration, Vibration of Continuous system, Rotor dynamics, Vibration Control

EDUCATION

Year	Discipline	Institute
2023	Ph.D. (Mechanical Engineering)	IIT Kanpur
2014	MTech (Mechanical Engineering)	IIT(BHU), Varanasi
2011	BTech (Mechanical Engineering)	JSS Academy of Technical Education, Noida

WORK EXPERIENCE

Nov'23-Till Now

Working as an Assistant Professor in the Department of Foundry and Forge Technology, **NIAMT Ranchi**

Oct'23-Nov'2023

Worked as an Assistant Professor in the Department of Mechanical Engineering, **HBTU Kanpur** (State govt. college)

April'23-Sep'2023

Research Engineer | Centre of Excellence on Machine Tools Design (**CoEMTD**) IIT(BHU) Varanasi U.P. India

- Working as a Research Engineer under the project **Centre of Excellence on Machine Tools Design** with Industry partner as Hindustan Machine Tool at IIT(BHU) Varanasi
- Design and FE analysis of machine tool components of **RAM type design for Heavy duty CNC Horizontal Boring and Milling Machine (Floor Type)** and **Roll grinding machine**

Mar'23-April'23

SENIOR STUDENT RESEARCH ASSOCIATE | *Med Tech, Imagineering Lab, IIT Kanpur, U.P. India*

- Working on the Machinability of Additively Manufactured Difficult-to-cut materials.
- Hybrid manufacturing: Machine could 3D print a near-net shape component that takes the place of a conventional casting or forging. Then, its subtractive capabilities could be applied to finish this part.

Sep'22-June'23

Guest faculty | *UTTAR PRADESH TEXTILE TECHNOLOGY INSTITUTE (**UPTTI**), Kanpur, U.P. India*

- Work as a temporary Guest faculty in the Department of Textile Engineering and teach subjects: Material Science, Manufacturing Science, Mechanism of Machine, Machine Design
- Conducting Engineering drawing lab

Aug'20-Dec'22	**SENIOR STUDENT RESEARCH ASSOCIATE** | *Machine Tool Dynamics Lab, IIT Kanpur* Worked as a research associate to design new experiments set up and conducting modal testing. • Proficient in measuring dynamic vibratory response of a system (cutting tools and machine tool) through Experimental Modal Testing • The dynamic vibration tests are performed by Tap test and experiments are conducted for rotating as well as for stationary circular saw mounted on VMC. • Experienced in numerical modelling and simulation of manufacturing process in **MATLAB, MAPLE, ANSYS** software • Design new experimental set up for rotating circular saw to perform modal analysis using non-contact actuator and eddy current sensor. **Administrative Experience** • Responsible for purchasing and procurement of Machine tool dynamics lab equipments such as cutting tools, tool holders, sensors for vibration measurements, and other modal testing equipment's
July'14-Jan'16	**Assistant Professor** | *PSIT College, Kanpur, U.P. India* • Worked as an Assistant Professor in the Department of Mechanical Engineering and taught subjects like Manufacturing Science, Material Science and Strength of Material. • Lab coordinator for the Manufacturing Science and Material Science lab. • Responsible and performed work for the department **NBA accreditation**, which enhances teaching-learning, academic progress of students, socio-economic development with technical manpower.
Oct'11-May'12	**Lecturer** | *Shanti Institute of Technology, Baghpat Road, Meerut, U.P. India* • Worked as a Lecturer in the Department of Mechanical Engineering and taught subjects like Material Science and Fluid Mechanics.

PROJECT (Ph.D)

July'2017 - Mar'2022	**Dynamics and stability of metal cutting circular saws constrained with lubricated guides (SERB, DST)** ***Thesis Supervisor: Dr. Mohit Law | Machine Tools Dynamics Lab, IIT Kanpur*** • Model based investigation of the dynamics and stability of circular saw used for cutting bars, tubes and wood sawing applications. • Our findings can instruct sizing and placing guides and in selecting appropriate fluid media for stabilizing metal sawing processes.

RESEARCH PUBLICATIONS

• **S. Singhania**, P. Kumar, S. K. Gupta and M. Law, 'Influence of guides on critical speeds of circular saws', Advances in Computational Methods in Manufacturing, 519-530, ICCMM, IIT Guwahati, 2019, (**Best paper award**) https://doi.org/10.1007/978-981-32-9072-3_45

- **S. Singhania**, M. Law, Regenerative instabilies of spring-guided circular saw, Procedia CIRP – Proceedings of the CIRP HPC, UK, 2020 https://doi.org/10.1016/j.procir.2021.02.017
- **S. Singhania**, A. Singh, M. Law, Dynamics and stability of metal cutting circular saws with distributed and lubricated guides, Journal of Vibration Engineering and Technology, 2022:1-13 https://doi.org/10.1007/s42417-022-00544-6
- **S. Singhania**, M. Law, Influence of Process Damping on the Regenerative Instability of Guided Metal Circular Sawing, Manufacturing Technology Today, Vol. 22, No. 4, April 2023 https://doi.org/10.58368/MTT.22.4.2023.20-25
- **S. Singhania**, M. Law, Influence of Process Damping on the Regenerative Instability of Guided Metal Circular Sawing, Proceedings of the COPEN12, IIT Kanpur, 2022
- **S. Singhania**, M. Law, Regenerative instabilities in guided metal circular sawing, Sādhanā Journal, 2023 (in press)

TEACHING ASSISTANTSHIP (TA)/TRAINING

- Tutor and TA in TA202 Manufacturing Science Lab in 2019 and 2020 respectively (IIT Kanpur)
- TA in Manufacturing science technologies courses in 2017 and 2018 (IIT Kanpur)
- TA in **Modal Analysis** and **Machining Dynamics** courses in 2018, 2019 and 2020 (IIT Kanpur)
- Actively participated in the training programme on **CNC programming and operation of Machining Centre at IMTMA Pune**
- Provide assistance to MATLAB Training at IITK (2020)

AWARDS /ACHIEVEMENTS

- Awarded a Fellowship worth INR 35,000 per month till five years in Ph. D. by **Ministry of Human Resource Development**, Government of India.
- Awarded an **Honorarium** worth INR 4,000 per month for three years for doing commendable work on SERB Project by Dean of Research and Development Office, **IIT Kanpur**.
- Qualified **GATE 2012** with **AIR-1517** and **98.95%** (Graduate Aptitude Test in Engineering)