Divyesh Mistry

divyesh-mistry.github.io/webpage/
linkedin.com/in/divyesh-mistry github.com/divyesh
divyesh@aero.iitb.ac.in +91 87687-08586
Aerospace department, IIT - Bombay, Powai, Mumbai, Maharashtra 400076

Education

Indian Institute of Technology - Bombay, Mumbai, India 2018-present

Doctor of Philosophy (Ph.D.), Aerospace Engineering
Stream : Aircraft Structures
Advisor : Dr. Amuthan

Indian Institute of Technology - Kharagpur, West Bengal, India 2014

Master of Technology (M.Tech.), Mechanical Engineering,
Stream : Mechanical System Design
Advisor : Prof. M.C. Ray

Aeronautical Society of India, New Delhi, India 2013

Bachelor of Engineering, Aeronautical Engineering
Stream : Aero Mechanical

Research Projects

Sequential multiscale modeling of materials 2018-present

Funding agency : **Defence Metallurgical Research Laboratory (DMRL), India**

- Spearheaded cutting-edge research on hardening mechanisms in nickel superalloys, with a particular focus on the detrimental effects of **Prior particle boundaries (PPBs)**, to support the development of next-generation aerospace materials.
- Developed and implemented a state-of-the-art **hierarchical multiscale material model** that seamlessly integrates atomistic simulations, molecular dynamics simulations using LAMMPS, and 2D **discrete dislocation dynamics (DDD)** to gain unprecedented insights into the dislocation behavior and effective dislocation-obstacle strengthening mechanisms of nickel superalloys in the presence of PPBs.
- Utilized **LAMMPS**, **Ovito**, **Atomsk** and **Python** to expertly model and post-process the microstructure of nickel superalloys, gaining valuable insights into their mechanical behavior under extreme conditions.

Developing an MPI-enabled MD code for efficient parallel simulations 2019-2020

Funding agency : **Industrial Research and Consultancy Centre (IRCC), India**

- Developed an advanced Molecular Dynamics (MD) simulation code using C++ and MPI, implementing highly efficient parallel algorithms that significantly accelerated simulations and enabled investigations of larger systems and longer timescales than previously feasible.
- Collaborated with a team of experts to enhance the functionality and optimize the performance of a proprietary Molecular Dynamics (MD) simulation code. Contributed to the identification of areas for improvement and worked closely with colleagues to develop and implement new features, resulting in significant improvements to the code's overall capabilities.

Dislocation Avalanche Mechanisms in Metallic Materials : Investigation and Simulation using C++ and Python 2021-PRESENT

Funding agency : Industrial Research and Consultancy Centre (IRCC), India

- Researched dislocation avalanche mechanisms and developed a custom simulation code using C++ and Python to investigate their behavior in metallic materials.
- Conducted extensive post-processing and analysis of simulation data to identify critical factors influencing avalanche dynamics.

Smart Structures Analysis and Design 2014-16

Funding agency : **Ministry of Human Resource Development (MHRD)**, India

- Researched dislocation avalanche mechanisms and developed a custom simulation code using C++ and Python to investigate their behavior in metallic materials.
- Conducted extensive post-processing and analysis of simulation data to identify critical factors influencing avalanche dynamics. Results have important implications for the design and optimization of materials for industrial applications.

Working Experience

January 2018 – Present

Indian Institute of Technology- Bombay, Aerospace Engineering, Mumbai, India

Teaching Assistant

- AE 639 : Continuum Mechanics, Spring 2019 and Fall 2019.
- AE 102 : Data Analysis and Interpretation, Spring 2020, 2021, 2022.
- AE 731 : Multiscale Modeling of Materials, Fall 2020.

June 2016 – December 2018

CMR Institute of technology, Department of Mechanical engineering, Bangalore, India

Assistant Professor

- **Subject Taught**

  ME 832 : Experimental Stress Analysis
  ME 61 : Finite Element Methods
  ME 15/25 : Elements Of Mechanical Engineering.
  MEL 68 : Modeling and Analysis Lab

Position of responsibilities

June 2021 – June 2022

Department Placement Coordinator (DPC),

Indian Institute of Engineering Bombay, Aerospace Engineering, India

- Coordinated with industry partners and facilitated the recruitment process of students for internships and full-time positions.
- Organized and conducted career development workshops and seminars to enhance students' employability skills.
- Assisted in the placement of students by reviewing resumes, conducting mock interviews, and providing personalized feedback.
- Maintained effective communication channels between students, industry partners, and the university administration to ensure smooth coordination of placement activities.

June 2014 – June 2016 | **Teaching assistant**,
Indian Institute of Engineering kharagpur, Mechanical System Design, India

- Assisted professors in the delivery of course material, grading assignments and exams, and holding office hours.
- Led tutorial sessions and supervised laboratory experiments to enhance students' understanding of course material.
- Demonstrated strong communication and leadership skills while mentoring and supporting students.

AWARDS, ACHIEVEMENTS , AND HONORABLE MENTIONS

- **MHRD POSTGRADUATE GATE FELLOWSHIP** 2014-2016
  Ministry of Human Resource Development, India
- **MHRD TEACHING ASSISTANTANTSHIP THROUGH PROJECT** 2018-Present
  Industrial Research and Consultancy Centre (**IRCC**), India
- All India rank **69** in Graduate Aptitude Test in Engineering (**GATE**) 2014

PROFESSIONAL MEMBERSHIPS

AMAeSI | **Aeronautical Society of India**, New Delhi, India
Associate Member
Membership No. : G12589
Aeronautical Society of India (AeSI) is the principal Society in India serving the professions in areas of aeronautics, aerospace and aviation.

Competences

Programming	Python, C++, MATLAB, High Performance Computing (OpenMP, MPI, CUDA)
Atomistic Simulations	LAMMPS, ATOMSK, OVITO
FEA Simulations	ANSYS, ABAQUS

Languages

English ●●●●●
Hindi ●●●●●
Gujarati ●●●●●
Marathi ●●●●

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References

Dr. Amuthan A. Ramabathiran
Assistant Professor, Aerospace Engineering
Indian Institute of Technology - Bombay
amuthan@aero.iitb.ac.in
+91-22-2576-7111

Dr. Amit Singh
Assistant Professor, Mechanical Engineering
Indian Institute of Technology - Bombay
amit.k.singh@iitb.ac.in
+91-98206-69363