Divyesh Mistry

Ph.D. Research Scholar, IIT Bombay, Mumbai, India-400076

d.mistryg@gmail.com (+91) 8768708586
divyesh-mistry.github.io/webpage/ linkedin.com/in/divyesh-mistry

Education

Jan 2019 - present — **Doctorate**, Aerospace Engineering, Indian Institute of Technology - Bombay, Mumbai-400076

Advisors : Prof. Amuthan A. Ramabathiran, Prof. P J Guruprasad
Funding : MHRD Teaching Assistantship through Project (TAP)
Thesis : Multiscale Modeling of Prior Particle Boundaries in Nickel-based Superalloys
Key Subjects : Multiscale Modeling of Materials, Continuum Mechanics, High Performance Scientific Computing, Tensors for Engineers, Parallel Scientific Computing and Visualization
Final Grade : 9.36/10

June 2014 - July 2016 — **M.Tech.**, Mechanical Engineering, Indian Institute of Technology - Kharagpur, West Bengal-721302

Post Graduation Specialization : Mechanical System Design
Advisor : Prof. Manas Chandra Ray
Funding : MHRD GATE Fellowship
Thesis : Simple Mesh Free Model for Static Analysis of Smart Composite Beams
Key Subjects : Advanced Mechanics of Solids, Fracture Mechanics, Mechanics of Composites, Vibration Analysis, Applied Elasticity, Finite Element Method
Final Grade : 8.85/10

December 2013 — **B.E.**, Aeronautical Engineering, The Aeronautical Society of India, New Delhi

Graduation Specialization : Aero Mechanical
Key Subjects : Aircraft Structures, Aerodynamics, Propulsion, Aircraft Stability & Control, Solid Mechanics, Fluid Mechanics

Competences

Programming	Python, C++, High Performance Computing (OpenMP, MPI), Unix/Linux Shell scripting, Git, GitHub, MATLAB
Packages	LAMMPS, ATOMSK, OVITO, NEPER, Ansys, ABAQUS, AutoCAD, LaTeX, Gnuplot
Data Analysis	scikit-learn, pandas, NumPy, SciPy, Matplotlib
Operating Systems	Ubuntu, macOS, Windows
Languages	Reading, writing and speaking competencies in English, Hindi and Gujarati.

Teaching Experience

June 2016 – Dec 2018 — **Assistant Professor**, *CMR Institute of Technology, Mechanical Engineering, Bangalore-560037, India*

- **Curriculum Development :** Led the development of the Mechanical Engineering program as a committee member at CMR University.
- **Workshop Organization :** Conducted workshops on MATLAB, Python, and ANSYS, enhancing undergraduate students' practical skills.
- **Teaching Excellence :** Delivered courses on Experimental Stress Analysis and Finite Element Methods, while managing CAD, Design, and Engineering workshops.

Teaching Experience (continued)

Jan 2019 – Present **Institute Teaching Assistant**, *IIT Bombay, Aerospace Engineering, Mumbai-400076*
Subject : Continuum Mechanics, Data Analysis and Interpretation, Multiscale Modeling of Materials, Finite Element Method

June 2014 – July 2016 **Institute Teaching Assistant**, *IIT Kharagpur, Mechanical Engineering, Mumbai-400076*
Subject : Vibrational Analysis, Finite Element Method, Tribology Laboratory

Research Projects

Jan 2025 – Present **Rate-dependent Constitutive Modeling of Shape Memory Alloy(SMA) Composite for Ballistic Response**
Funding agency : **Defence Research** & **Development Organisation(DRDO)**
Advisors : Prof. Krishnendu Haldar, Prof. P J Guruprasad, Prof. C.S. Yerramalli

June 2019 – Present **Multiscale Modeling Of Prior Particle Boundaries in Nickel-based Superalloys**
Funding agency : **Defence Metallurgical Research Laboratory (DMRL)**
Advisor : Prof. P J Guruprasad, Prof. Amuthan A. Ramabathiran
Tools : LAMMPS, OVITO, Atomsk, Polycrystalline DDD, Python, HPC
Developed a multiscale material model to study dislocation behavior, stress distribution, and strengthening mechanisms around PPBs and γ/γ' phases.
Addressed challenges in modeling complex interactions between PPBs and dislocation dynamics in Ni-based superalloys.

Jan 2022 – Present **Dislocation Avalanche Mechanisms in Metallic Materials**
Funding agency : **Industrial Research and Consultancy Centre (IRCC)**
Advisor : Prof. P J Guruprasad, Prof. Amuthan A. Ramabathiran
Tools : C++, 2D DDD, Python
Investigating dislocation avalanche dynamics and plastic deformation mechanisms in metallic materials.

Aug 2022 – Dec 2022 **MPI-Enabled Molecular Dynamic Code Development**
Coursework project : HPC(ME766)
Tools : C++, MPI, OpenMP, HPC
Developed a molecular dynamics simulation code with efficient parallel algorithms for optimized computational performance.

June 2014 – July 2016 **A Simple Mesh-Free Model for Static Analysis of Smart Composite Beams**
Funding agency : **Ministry of Human Resource Development**
Advisor : Prof. Manas Chandra Ray
Tools : MATLAB, Ansys, Abaqus
Analyzed smart composite beams reinforced with piezoelectric materials.

Certifications

Jan 2020 **Using Python for Research**, edX, HarvardX, Harvard University.
Aug 2020 **The Unix Workbench**, Coursera, Johns Hopkins University.
Aug 2020 **Material Behavior**, Coursera, Georgia Institute of Technology.
May 2018 **A Hands-on Introduction to Engineering Simulations**, edX, CornellX, Cornell University.

Publications and Conference Proceedings

[1] Mistry D., & Ramabathiran A. A., **Molecular Dynamics Analysis of Microstructural Influences on Dislocation Dynamics in Nickel Superalloys**, Communicated.

[2] Mistry D., Guruprasad P. J., & Tawqeer N., **Polycrystalline Discrete Dislocation Dynamics Framework for Ni-based Superalloys with Prior Particle Boundaries (PPB)**, Communicated.

[3] Mistry D., Guruprasad P. J., & Ramabathiran A. A., **An atomistically informed discrete dislocation dynamics study of prior particles boundaries in Ni superalloys**, 17th Conference of COMPLAS Series, 05th-07th Sep 2023 Barcelona, Spain.

[4] Mistry D., Guruprasad P. J., & Tawqeer N., **Studying Dislocation - Prior Particle Boundary Interactions in Ni-based Superalloy from Polycrystalline Discrete Dislocation Dynamics**, **Accepted** at TMS 2025, 154^{th} Annual Meeting & Exhibition, March 23-27, 2025, Las Vegas, Nevada, USA.

Positions of Responsibility

June 2021 – July 2022 **Department Placement Coordinator (DPC)**, *Department of Aerospace Engineering, IIT Bombay*

Awards, Achievements, and Honorable Mentions

2013 **Permanent Membership** : Awarded permanent membership as an **Associate Member** at the **Aeronautical Society of India**

2014 **All India Rank 69** : Achieved in the Graduate Aptitude Test in Engineering (GATE)

2019 MHRD Teaching Assistantship Through Project : Awarded by the **Industrial Research and Consultancy Centre (IRCC)**

2023 IIT Bombay Travel Grant : Awarded to attend the international conference *COMPLAS 2023*, Spain

2025 Institution of Eminence Funds, IIT Bombay : Awarded to attend the international conference *TMS 2025*, USA

References

Prof. Amuthan A. Ramabathiran (Ph.D. Supervisor)
Assistant Professor, Aerospace Engineering, California Poly State University, CA 93407, USA
aramabat@calpoly.edu
805-756-0873
Preferred contact via email.

Prof. P J Guruprasad (Ph.D. Supervisor)
Professor, Aerospace Engineering, Indian Institute of Technology - Bombay, Mumbai-400076, India
pjguru@aero.iitb.ac.in
(+91)-22-2576-7142
Available for contact during working hours.

Prof. Amit Singh (RPC Chairperson)
Associate Professor, Mechanical Engineering, Indian Institute of Technology - Bombay, Mumbai-400076, India
amit.k.singh@iitb.ac.in
(+91)-22-2576-5363
Available for contact during working hours.