

Divyesh Mistry

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

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🎓 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 Halder, 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, 154th 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


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|------|---|--|
| 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 <i>COMPLAS 2023</i> , Spain |
| 2025 |  | Institution of Eminence Funds, IIT Bombay : Awarded to attend the international conference <i>TMS 2025</i> , 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


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 Available for contact during working hours.

Prof. Amit Singh (RPC Chairperson)

Associate Professor, Mechanical Engineering, Indian Institute of Technology - Bombay, Mumbai-400076, India

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 Available for contact during working hours.