PRANJAL MISHRA

pranjalmishra291299@gmail.com pranjalmish1 Google Scholar

RESEARCH INTERESTS

3D Vision, Graphics, Reinforcement Learning, and Robotics

EDUCATION

Bachelor of Technology | Indian Institute of Technology Roorkee, India — July 2017 - June 2021 | GPA: 8.8/10

Major: Metallurgical & Materials Engineering

Minor: Computer Science & Engineering

Coursework: *Mathematical Methods I & II*, *Data Structure*, *Design & Analysis of Algorithms*, *Computer Architecture*, *Computer Network*, *Software Engineering*, *Probability & Statistics*, *Modelling Simulation & Computer Applications*

Higher Secondary Education | Central Board of Secondary Education — Apr 2016 | 89.60 %

PROFESSIONAL EXPERIENCE

Technology Engineer | Research & Development — July, 2021 - present

Sterlite Technologies Limited — Aurangabad, India

- Worked on FEM based mathematical models (Python & MATLAB) for optical fiber manufacturing process
- Developed machine-learning-based control and optimization algorithms for different processes
- Developed Multiphase CFD & FSI simulations to study fluid flow characteristics for dip-coating process
- Responsible for maintaining and monitoring the HPC Infrastructure

External Collaborator | Software Team — Sept, 2022 - present

Qilimanjaro Quantum Tech — Remote

- Contributed to the implementation of elements in the full-stack software solution
- Contributed to the development of low-level libraries (Python & C++) to control the qubits
- Tested & debugged backend framework for automatically deploying quantum circuits on quantum hardware
- Developed new features in coordination with the quantum hardware & quantum theory teams

Research Internship | Delft University of Technology — May, 2021 - Aug 2021

Mechanics Materials Computing Group - Dr. Sid Kumar — Remote

- Implemented physics-informed neural networks (PINNs) in Tensorflow to solve ODEs & PDEs
- Developed PINNs to find energy-minimized microstructures associated with non-convex energy potentials

Research Internship | Indian Institute of Science (IISc) — May, 2019 - Jul 2019

MSD Lab - Prof. Mayank Shrivastava — Bangalore, India

- Synthesized Graphene and Hexagonal Boron Nitride using thermal CVD process
- Fabricated Graphene and hBN based device for Terahertz applications.
- Implemented GANs and 1D-CNNs for Raman spectral data augmentation of isolated 2D materials

PROJECTS

Machine Learning Driven Discovery of Novel Thermoelectric Materials (Undergraduate Thesis) — Aug 2020 - Apr 2021

CMEG Lab | Dept. of Metallurgical and Materials Engineering | Indian Institute of Technology Roorkee

- Developed ML framework to accelerate first-principle calculations for predicting low thermal conductivity oxides
- Built supervised learning models trained on AFLOW database for predicting thermal conductivity values
- Developed DFT models to calculate thermal conductivity of identified compounds

Transient Analysis of Cross-talk Induced Effects in CNT Bundle Interconnects — Jan 2019 - Apr 2019

Prof. B.K. Kaushik | Dept of Electronics and Communication Engineering | Indian Institute of Technology Roorkee

- Modelled closed-form matrix rational approximation algorithm to analyze delay and cross-talk noise of RLC on-chip with CNT and GNR interconnect in MATLAB

MaAuVe | Autonomous vehicle Aug 2018 - Mar 2019
Software Team, Models and Robotics Section (MaRS) | Indian Institute of Technology Roorkee

- Responsible for development and implementation of Lane Detection Pipeline on OpenCV
- Designed the Omni-wheeled chassis using SolidWorks

PUBLICATIONS & PATENTS

1. 2022. Patent No. 202211032954 : **Apparatus and method for manufacturing an optical fiber using non-contact pneumatic levitation** [Patent Filled]
2. 2021. NK Tailor, S. Kar, **P. Mishra**, A. These, C. Kupfer, Hanlin Hu, M Awais, M. Saidaminov, M. Ibrahim Dar, C. Brabec, and S. Satapathi. **Advances in Lead-Free Perovskite Single Crystals: Fundamentals and Applications** [ACS Materials Letter (paper)]

TECHNICAL SKILLS:

Programming Languages: Python, MATLAB, C++, R, SQL
Frameworks: Sklearn, PyTorch, Tensorflow, Qiskit, Pennylane, JAX
Tools: COMSOL Multiphysics, SolidWorks, ANSYS Fluent, OpenPBS, Git, OpenCV, OpenMP, LaTeX, Premier Pro

AWARDS AND EXTRA-CURRICULAR ACTIVITIES

Lean Six Sigma Yellow Belt course	Sterlite Technologies Limited | 2022
Toastmasters International - Member	2022
MMVY Academic fellowship from the Madhya Pradesh State Government of India	2017-2021
Undergraduate Student Mentor	IIT Roorkee, India | 2019-20
Video Editor, Cinematic Section (CineSec)	IIT Roorkee, India | 2018-20
Software Team Member, Models and Robotics Section (MaRS)	IIT Roorkee, India | 2018-20
Exhibited Waiter Robot in Engineer's Conclave at 7th Inter IIT Tech meet.	IIT Bombay, India | 2019
Secured 1st position in National Space Science Challenge by ISRO	IIT Kharagpur, India | 2018
Best Execution Award for Quadruped Bot in Campus Tech meet	IIT Roorkee, India | 2018

TEACHING EXPERIENCE

Teaching Assistant | NPTEL Online Certification Course Jan 2021 - Apr 2021
Course: Material Science & Engineering

- Contributed to the development of appropriate teaching material for the course, such as tutorials and assignments
- Responsible for answering student questions on the forum