



PRANJAL MISHRA

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RESEARCH INTERESTS

Quantum Communications, Quantum Computing, Machine Learning & Numerical Methods

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 Quadraped 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