Yash Vardhan Bhobia

Linkedin | Github

Mobile: +91-916-6687-267
Email: yvbhobia@gmail.com
yashvardhan@iisc.ac.in

Education

- **Indian Institute of Science** — Bangalore, India
  Bachelor of Science(Research); Major: Material Sciences; GPA: 8.10 — *Aug 2020 - contd.*

  Courses: *Solid State Physics, Quantum Mechanics-I, Material Design Principles for electronic, electromechanical and optical functions, Magnetism, Magnetic Materials and Devices, Functional Properties of Materials-I and II, Mathematical Methods of Physics, Nuclear and Particle Physics, Fundamentals of MOS Analog Circuit, Computational Modeling of Materials, Computer Security, High Performance Computer Architecture(Audit), Data Structure and Algorithms, Robot Learning and Control, Machine learning for signal processing, Semiconductor Circuit and Devices, Information Theory, Analysis and Linear Algebra-I and II, Statistics and Probability*

Skills Summary

- **Laboratory Skills**: Probe Station, AGM(Alternating Gradient Magnetometer), XRD, AFM, DC/RF Sputtering, SEM
- **Scientific Softwares**: MuMax, OOMMF, Quantum ESPRESSO, Vampire, XCrySDen, LabView, MATLAB
- **Languages**: Python, C, Java, Matlab, Git, Bash, Assembly(Intel, AT&T, Arm), Flutter
- **Frameworks**: Angr, Scikit, TensorFlow, Keras, Pytorch, YOLO, Scipy
- **Markup**: LaTeX, HTML, CSS

Honors and Awards

- KVPY Fellowship(Kishore Vigyan Protsahan Yojna, Issued by Indian Institute of Science)
- NTSE Scholarship(National Talent Search Examination, conducted by Central Board of Secondary Education, India)
- Recognized as one amongst top 1% of students in the All India High school final examinations

Experience

- **IMRE, A*STAR Research** — Singapore, Singapore
  Research Assistant (Full-time) — *May 2023 - Ongoing*
  - **Spintronics|Skyrmions|MTJs|MuMax|Python**: Conducted investigation and characterization of multilayer magnetic thin films using AGM technique. Examined electrical transport properties and studied current induced Spin-Orbit Torque (SOT) switching behaviour in multistate Magnetic Tunnel Junctions (MTJs) for cutting-edge neuromorphic applications. Employed micromagnetic simulations using MuMax, to understand the intricate switching behavior of skyrmion-based devices.
- **Garrett Advancing Motion** — Bangalore, India
  Engineering Intern (Full-time) — *May 2022 - July 2022*
  - **Python|Genetic Algorithm|Johnson Cook Model|NN**: Optimised material properties for blast and containment test of materials to be used for turbocharger housing, using ballistic test data. Evaluation and analysis of parameters for Johnson-Cook Equation for various metallic alloys, using a genetic algorithm. These python codes have been actively deployed by Garrett for their analysis work since then.
- **Indian Institute of Science - Vision Lab** — Bangalore, India
  Research Intern — *May 2021 - June 2021*
  - **ML|Eye Tracking Model**: Helped in development of eye tracking model using the YOLO framework, trained on PascalVOC dataset. This model was deployed by Vision Lab in their experiments with test monkeys for understanding their behaviour and choices.
- **Indian Institute of Science - CDS Department** — Bangalore, India
  Research Intern — *May 2021 - July 2021*
  - **ML|Zero Shot Knowledge Distillation**: Undertook a reading project on Zero Shot Knowledge Distillation method, understanding the generation of data impressions from parent model for training the student model. Model was further tested on various frameworks and parameters were optimised for improving the robustness of the model.

Projects/Proposals

- **Growth of Epitaxial Rare Earth Nickelate thin films on** $LaAlO_3$: As a part of course project, grew $EuNiO_3$ on LAO epitaxially using RF Sputtering. Used XRD to confirm the epitaxial growth and crystallinity of the film. AFM was used to study the surface morphology of the film.
- **Building an in-kernel, per-process, system-call sandbox**: Worked with Linux Security Modules to setup syscall hooks in kernel for implementation of syscall sandbox, with a generated control flow graph using angr tool. Also implemented the same syscall sandbox, by using ptrace utility, instead of using LSMs.
- **Exoplanet detection using Machine Learning Models**: Used various state of art machine learning techniques for development of a classifier model, for classification of celestial bodies into potential candidates for exoplanets.
- **Proposal: A memory simulator based on first principle analysis for material selection**: Proposed to build a memory simulator, which would be able to simulate the read/write latency and power consumption of a memory system, based on the first principle analysis of the materials and stack configurations assumed for MTJ's and FET's. Won a grant of 1Mil INR for this project.
- **Proposal: Non-Linear thin film based high energy capacitors**: Was part of a team, to propose a project for building high energy capacitors. Helped with thin film fabrication using RF Sputtering, and learnt capacitor fabrication using lithography. Did endurance and electrical characterization on the same.

Volunteering Experience

- **Debug Club, IISc** — Bengaluru, India
  Convenor — *Jan 2022 - Jan 2023*

  Conducted various workshops and talks for undergraduate and masters students at Indian Institute of Science, around topics ranging from common academic softwares, to code optimization and profiling. Also, gave a talk on computer architecture for B.Tech. first and second year students(attendance, ∼50 Students).

- **Pravega, IISc** — Bengaluru, India
  Finance coordinator — *Jan 2022 - Sept 2022*

  Prepared and maintained a budget and finances of more than 10 million INR for Pravega, the Cultural and Sci-Tech fest of IISc. Played a crucial role in ensuring the smooth flow of funds for the fest, involving retrieval of funds from sponsors, and allocation of funds to various teams for props and preparation, as well as ensuring the distribution of prize money to winners.

- **Sponsorship and Public Relations Team, Pravega, IISc** — Bengaluru, India
  Volunteer — *Jan 2022 - Sept 2022*

  Reached out to bring corporate funding for Pravega, 2022. Played a role in the preparation of sponsorship proposals and presentations, and in the preparation of the sponsorship brochure.

References

Prof. Bhagwati Prasad
Assistant Professor
DEMAND Lab, Department of Materials Engineering, IISc
Email: bpjoshi@iisc.ac.in

Prof. Anjan Soumyanarayan
Senior Group Leader, IMRE and Assistant Professor,NUS
Institute of Material Research and Enginnering, A*STAR
Email: anjan@imre.a-star.edu.sg

Prof. Sachin Rhondiya
Assistant Professor
Material Enginnering , IISc
Email: rondiya@iisc.ac.in