Shravan Godse

P: +1 412 654 0388 | sgodse@andrew.cmu.edu | LinkedIn | Google Scholar

EDUCATION

Carnegie Mellon University — August 2022 - Present
PhD Candidate, Department of Mechanical Engineering — GPA: 4.0/4.0

Indian Institute of Technology, Bombay — July 2018 - May 2022
Bachelor of Technology with Honors in Mechanical Engineering — GPA: 9.02/10.00

RESEARCH EXPERIENCE

The Malen Laboratory | PhD Candidate | Prof. Jonathan Malen (CMU) — August 2023 – Present
Collaborating with cross-functional research groups across 4 universities to develop and characterize thermally conductive polymers

- Characterized the thermal conductivity of polymer thin films and composites using Frequency Domain Thermoreflectance (FDTR) and Transient Hot Wire techniques. Gained expertise in optical systems, lock-in amplifier-based signal detection, clean room nanofabrication and advanced data acquisition and analysis with MATLAB and Python.
- Simulated stereoisomers of single chain Polypropylene and Polystyrene using the Molecular Dynamics software – LAMMPS.

EEG Lab | Graduate Researcher | Prof. Venkat Viswanathan (CMU) — August 2022 – August 2023

- Probed anionic redox in high specific capacity Lithium rich cathodes using Density Functional Theory (DFT), state-of-the-art Equivariant Graph Neural Network potential (NequIP) and Grand Canonical Monte Carlo simulations.

Materials Research Lab | Undergraduate Researcher | Prof. Ankit Jain (IIT Bombay) — July 2020 – May 2022

- Investigated thermal conductivities of type-I clathrates $X_8Ga_{16}Ge_{30}$ (X: Sr/Ba) with potential applications in thermoelectricity using DFT and Anharmonic Lattice Dynamics on the SpaceTime supercomputing facility at IIT Bombay.

INDUSTRY EXPERIENCE

QPiVolta Technologies Pvt. Ltd. | Machine Learning Intern — January 2022 – April 2022

- Compiled and containerized GPU accelerated Quantum Espresso Software for ec2 instances on AWS using Docker
- Implemented a Python wrapper for accelerating ab-initio molecular dynamics simulations by 30x through active learning

Varroc Engineering Pvt. Ltd. | Advanced Engineering Intern — December 2019

- Performed extensive literature survey on charging protocols for Lithium-ion batteries for electric two-wheeler applications.
- Modeled Constant Current – Constant Voltage and Multistage charging protocols in MATLAB and Simulink and designed an optimal charging profile, maximizing charging efficiency, speed and battery life

PUBLICATIONS & CONFERENCE PRESENTATIONS

- *Effect of Chain Tacticity on the Thermal Conductivity of Polymers*, (Presentation) ASME International Mechanical Engineering Congress and Exposition (IMECE), Portland OR (2024)
- G. Reuveni, Y. Diskin-Posner, C. Gehrmann, **S. Godse**, et al., *Static and Dynamic Disorder in Formamidinium Lead Bromide Single Crystals*, The Journal of Physical Chemistry Letters, 14, 5, 1288-1293 (2023)
- **S. Godse**, Y. Srivastava and A. Jain, *Anharmonic lattice dynamics and thermal transport in type-I inorganic clathrates*, Journal of Physics: Condensed Matter, 34, 145701 (2022)

ACADEMIC PROJECTS

Data-driven Inverse Airfoil Design | Bayesian Machine Learning (CMU) — Spring 2023

- Designed a Convolutional Neural Network in PyTorch to predict lift-drag coefficients of airfoils with a R^2 score of 0.98
- Trained an Autoencoder and created a differentiable mapping for inverse design of airfoils with desired lift-drag properties

Manhole Cleaning Solutions | Machine Design (IIT Bombay) — Spring 2022

- Spearheaded a team of 8 and developed solutions to alleviate the issue of manual scavenging in India by designing machines such as Archimedes screw and automatic robots in Fusion 360 and MSC ADAMS software

Schrodinger-Poisson Equation Solver | Physics of Nanoelectronic Devices (IIT Bombay) — Autumn 2020

- Obtained a 99.64% accuracy with $1/10^{th}$ computational resources upon solving the self-consistent Schrodinger-Poisson equation using the technique of non-uniform mesh by Tan et al. for a finite quantum well using Python

TECHNICAL SKILLS

Experimental	:	Frequency Domain Thermoreflectance, Transient Hot Wire, Profilometry, X-Ray Reflectometry, Atomic Force Microscopy, Scanning Electron Microscopy, Clean Room Nanofabrication (Electron-beam and Sputtering)
Programming	:	Python, MATLAB, C++
Engineering Simulations	:	Solidworks, Ansys, Fusion 360, Fenics, MSC Adams
Materials Simulations	:	Quantum Espresso, VASP, LAMMPS, PhonoPy