Dhvaneel Visaria

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Education

Stanford University — Expected Jun '23
Master of Science in Mechanical Engineering — GPA: 3.810
- Specialization in Energy Systems and applications of computational modeling and machine learning

Indian Institute of Technology Bombay, India — Graduated Aug '21
Bachelor of Technology in Mechanical Engineering — GPA: 9.42/10
- Minor in Management - Shailesh J. Mehta School of Management, Minor GPA: 9.8/10
- Conferred Undergraduate Research Awards for exceptional research [URA01 & URA02]

Experience

Indepedent Research study | NanoHeat Lab — **Stanford University**
Guide: Prof. Mehdi Asheghi | Mechanical Engineering Department — Jan '22 - Present
- Working on two-dimensional MATLAB modeling of vapor chamber evaporation micropillar wick surface using energy analysis

Undergraduate Researcher | Materials Research Lab — **IIT Bombay**
Guide: Prof. Ankit Jain | Mechanical Engineering Department — Sep '19 - Aug '21
- Worked on first-principles-based **thermal transport** calculations of materials and **machine learning** applications
- **Materials Discovery**: Leveraged dimensionality reduction in autoencoder-based generative machine learning models to expedite discovery of graphene-like materials with exceptional thermal transport properties
- **Van der Waal's study**: Benchmarked effect of five different vdW functionals on the thermal transport of MoS_2 using high-throughput ab-initio calculations to improve thermal conductivity simulation results

Research Intern | Cooling Technologies Research Center — **Purdue University**
Guide: Prof. Justin Weibel | School of Mechanical Engineering | PURE 2020 — Apr '20 - Jun '20
- Developed **data-driven design** approach for high performance cold plates to select optimal heat exchange surfaces
- Built python framework to construct unique ML input using flow & heat transfer database for 700+ shapes
- Received **Best Poster** award in 20th iTherm Conference (2021) [Poster]

Publications

[1] Amey G. Gokhale, **Dhvaneel Visaria**, and Ankit Jain, "*Cross-plane thermal transport in Mos_2*", Physical Review B **104(11)**, 115403 (2021)

[2] Pai, Saeel S., **Dhvaneel Visaria**, and Justin A. Weibel, "*A Machine-Learning-Based Surrogate Model for Internal Flow Nusselt Number and Friction Factor in Various Channel Cross Sections*", 20th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (iTherm), (2021)

[3] **Dhvaneel Visaria** and Ankit Jain, "*Machine-learning-assisted space-transformation accelerates discovery of high thermal conductivity alloys*", Applied Physics Letters **117(20)**, 202107 (2020)

Projects

High-temperature molten-state batteries — Fall '21
Surveyed literature on high temperature molten battery technologies for stationary energy storage systems

Parallelization of genetic-algorithm-trained neural networks [**Report**] — Spring '20
Applied OpenMP and MPI parallelization paradigms suitably to efficiently train artificial neural networks in C++

Clean power generation using energy recovery from roads [**Report**] — Fall '20
Designed machinery and conducted its energy, economic and FEM analysis using Fusion 360 for clean power generation

Nanoindentation for cross-linking polymer SU-8 [**Poster**] — Summer '19
Evaluated nanoindentation data to study the effect of time on mechanical properties using mathematical modeling

Technical Skills

Languages: Python, C++, MATLAB, Bash
Atomic Simulation: Quantum Espresso, VASP, Ovito, ASE
Machine Learning: Keras, Matplotlib, Scikit-Learn
Software: AutoCAD, ANSYS Fluent, Fusion360

Relevant Coursework

ML/AI: Machine Learning, Programming Abstractions*, Deep Learning for Computer Vision*, High Performance Scientific Computing, Natural Language Processing [Online]

Energy Systems: Batteries, Advanced Thermodynamics, Modeling and Advanced Concepts*, Engineering Design Optimization*, DFT-based materials modeling, Finite Element Method