Anvita Bhagavathula

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Education

Cornell University (Cornell Tech), *M.Eng. Electrical and Computer Engineering* **New York • May 2024**
Awards: $35,000 merit-based scholarship

Brown University, *Sc.B. Physics with Honors, A.B. Applied Math, GPA: 3.95/4.0* **Providence • May 2023**
Relevant Courses: Deep Learning, Data Structures and Program Organization, Computational Probability and Statistics, Intro to Computational Chemistry, Solid State Physics (graduate-level), Quantum Mechanics I and II, Thermodynamics and Statistical Mechanics, Partial Differential Equations, Complex Analysis, Honors Statistics, Linear Algebra

Research Experience

Aqemia, *Deep Learning Research Intern* **Paris, France • June 2023 - Present**
- Developing graph neural network-based approaches to predict reaction synthesis feasibility of drug candidates. This project aims to accelerate the rate at which promising molecules are filtered, optimized, and synthesized within a drug-discovery startup.
- Proposed and implemented unique representation of SMILES reaction template strings using sub-graphs and encoded reaction site.
- Supervised by Dr. Jacques Boitreaud and Dr. Antoine Brochard. Skills: Python, Pytorch, RDKit, AWS, Git.

The Crunch Group, *Research Assistant* **Providence, RI • Oct 2022 – May Present**
- Designing and implementing self-adaptive neural networks to solve differential equations by integrating governing physical laws into their architectures.
- Supervised by Dr. Somdatta Goswami. Skills: Python, Jax, Git.

Li Lab and Rubenstein Lab, *Research Assistant* **Providence, RI • June 2021 – May 2023**
- Honors senior thesis project on using *ab-initio* quantum mechanical simulations to shed light on the electronic interactions responsible for novel superconducting state in 2D graphene systems.
- Experimentally built a nano-electronic device made from twisted tri-layer graphene to measure its unique properties at cryogenic temperatures. Computationally generated structure of this system using Python and carried out band structure and density of states calculations using density functional theory (DFT).
- Supervised by Dr. Jia Li and Dr. Brenda Rubenstein. Skills: Python, Bash Shell scripting, Quantum Espresso.

Microsoft Research, *Research Intern* **Seattle, WA • June 2022 – Aug 2022**
- Proposed an interpretable ML-based QSAR (quantitative structure-activity relationship) approach to predict food protein digestibility. Filed a provisional patent for this research.
- Created two ground-truth protein property datasets by combining amino acid indices and structural protein sequence embeddings extracted from a pretrained transformer model.
- The downstream impact of this work could minimize the role of animal experimentation in food production processes. Supervised by Dr. Sara Malvar and Dr. Ranveer Chandra. Skills: Python, Scikit-learn.

Work Experience

Transcelestial Technologies, *Software Engineer Intern* **Singapore • Jan 2021 – Apr 2021**
- Created Streamlit based client facing web-tool that halved time taken to qualify equipment installations for a laser communications startup. Built using Python.
- Designed and implemented a processing algorithm using Fourier analysis, Euler angle integration, and signal processing to analyze time-series vibration data and evaluate installation structures.
- This web-tool led to faster deployment of devices that facilitated internet connectivity in Southeast Asia during the COVID-19 pandemic. Supervised by Dr. Jan Smisek. Skills: Python, Git.

Leadership and Mentoring Experience

Physics Department Diversity Action Plan Committee, *Member* **Providence, RI • Jan 2020 – May 2023**
- Addressing diversity and inclusion issues within the Physics department in a committee of undergraduates, doctoral students, and faculty who belong to historically underrepresented groups in STEM.
- Designed climate survey to collect data on the state of diversity in the department which received over 100 responses.

Brown University Women in Physics, *Lead Coordinator* **Providence, RI • Jan 2021 – May 2023**
- Organized several community-building initiatives such as group study sessions, lunches, and peer mentoring.

International Mentoring Program, *Mentor* **Providence, RI • Jan 2021 – Aug 2021**
- Mentored a group of 12 international students and provided support for their transition to university. Facilitated virtual orientation events.

Publications (Preprint)

- Malvar, S., **Bhagavathula, A.**, Balaguer, M., Sharma, S., and Chandra, R. (2022). *Machine learning can guide experimental approaches for protein digestibility estimations.* arXiv:2211.00625 [cs, q-bio]. [online] Available at: https://arxiv.org/abs/2211.00625

Programming Languages: Proficient in Python, MATLAB, Bash Shell scripting, Pytorch, TensorFlow, Jax, Pandas, NumPy, RDKit, Scikit-learn. Experience with Quantum Espresso, LaTeX, and Git.
Languages: English, Spanish, Hindi, Telugu.