Ben Eng

408-707-8807 | eng-ben@outlook.com | linkedin.com/in/beneng2025 | github.com/BenEng11037

Education

Purdue University West Lafayette, IN

Bachelor of Science in Applied Mathematics, Computer Science *Aug. 2021 – Dec 2025*

Relevant Coursework: Data Structures & Algorithms, Differential Equations, Numerical Methods, Optimization

Experience

Modeling Intern May 2024 – February 2025

Donaldson Company *Bloomington, MN*

- Led a Python project implementing Fast Fourier Transform (FFT) algorithms for Phase Inversion Process Modeling, solving the Cahn-Hilliard equation in two dimensions with arbitrary boundary conditions. Presented findings to cross-functional teams, translating technical insights into actionable strategies for life sciences, ultimately enabling the company to produce its own filtration membranes, significantly reducing reliance on competitors and cutting costs.
- Spearheaded collaboration with PhD-level computational scientists to develop and implement a GeoDict optimization tool integrated with Python. This tool optimized media microstructure, targeting flow efficiency and pressure drop in hollow fiber filtration media, reducing task completion time from several weeks to under an hour. Deployed the solution on Azure DevOps, presenting results to a company wide expo, and establishing a proof-of-concept for future optimization efforts.
- Contributed to the Modeling and Data Science department's infrastructure by authoring comprehensive Wiki articles that address obstacles encountered by team members, fostering continuous improvement.

Undergraduate Research Assistant Aug 2023 – May 2024

Computational Quantum Electromagnetics Lab *West Lafayette, IN*

- Collaborated in the core coding development of a "ground up" 1D Finite Element Method (FEM) analysis python codebase in order to model 3D electromagnetic phenomena. This requires generating an EM physics encoded matrix via the FEM process.
- Investigated suitable eigen solvers specialized for solving 3D EM problems with FEM due to Python constraints, which in turn requires an "in house" algorithm to optimize and analyze EM partial differential equations through numerical methods and error analysis.

Mathematics Counselor Feb 2022 – April 2022

Purdue Polytechnic High School *Indianapolis, IN*

- Mentored four high school students in pre-calculus, and analytical thinking to enhance their mathematical proficiency and build upon their critical thinking.
- Completed reports for 6 weeks, meticulously analyzing the mathematical progress and development of each student, in order to track and document student growth and foster academic success.

Projects

Purdue Marketplace Application | *Java, Git, Docker* Aug 2023 – May 2023

- Created a Java-based, student-exclusive virtual marketplace enabling Purdue students to list and trade items commonly sought after in a college community.
- Implemented a concurrent client-server socket model, ensuring data security by utilizing a peer-to-peer server structure, and designed robust security measures linking account access to each student's unique numerical ID and alphanumeric passcode.

Technical Skills

Foreign Languages: Cantonese, Japanese
Languages: Java, Javascript, Python, C/C++, SQL, Swift, R, MatLab, LaTeX, Markdown
Developer Tools: CICD, UNIX, Azure Devops, Git, Docker, podman, COMSOL, GeoDict, pandas, NumPy, SciPy
Concepts: Spectral (Fourier) Methods, Partial Differential Equations, Machine Learning, Linear Regression

Extracurriculars

Clubs: Society of Asian Scientists and Engineers, Purdue Automotive Performance Association
Hobbies: Graphic Design, WRC, Touge, 24 Hours of Lemons