

Brendan Hendrata (US Citizen)

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA

Expected Graduation: August 2028

BSc Double Major in Electrical and Computer Engineering and Physics

EXPERIENCE

A*STAR: Agency for Science, Technology, and Research, Singapore

May 2024 – Ongoing

AI/ML Research Intern

- Developed a **physics-informed neural network** for molecular dynamics simulations using **PyTorch**, increasing prediction timestep by **8000-fold** and reducing required data for prediction by **200%**
- Implemented **OOP** to calculate **Jacobian matrices** using **finite differences** for non-differentiable functions in high-dimensional problems contributing over **1000 lines** of code for department-wide use

Singapore Institute of Technology, Singapore

February 2024 – April 2024

Computational Biotech Research Intern

- Utilized **LAMMPS molecular dynamics software** and **rheometers** to optimize rheology in modified starch, protein, and mineral matrices for large-scale bioprocessing
- Analyzed the impact of **calcium fortification** on gelation and viscosity of starch-protein matrices, determining optimal concentrations for **increased storage modulus** (G') and thermal stability

HerbYvore, Alternative Foods Start-up, Singapore

December 2023 – January 2024

R&D Engineering Intern

- Collaborated in a team of 3 to engineer scalable, **automated production solutions**, successfully completing 3 production cycles with custom machinery, achieving **33%** shorter production durations
- Developed and tested **over 50 formulations** of pulse-based protein and starch derivatives

National Cancer Center Singapore, Singapore

February 2024 – June 2024

Youth Project Lead, Low-Dose CT Lung Cancer Detection Campaign

- Managed a **10-member subcommittee** of youth volunteers and poster graphic designers, ensuring effective coordination and timely completion of campaign tasks across Singaporean community centers, achieving a **20% rise** in LDCT screening participation within 6 months

Singapore Academy of Young Scientist and Engineers, Singapore

April 2024 – Ongoing

Advisory Council

- Directed strategic decision-making for events, corporate partnerships, and membership initiatives, enhancing organizational outreach and engagement through targeted publicity efforts

Espero for Innovative Philanthropy, Non-profit Organization, International

Since 2022

Co-founder and Chief Operating Officer

- Expanded the non-profit to over 120 members and launched 9 major initiatives, raising over **\$83,000** in pro-bono work across 10 countries, earning a feature in The Straits Times for global impact
- Led the development of our **CMS/HTML** website, managed **OpenSea NFT** collections, and implemented AI models for **digital art production** from raw refugee camp images

PROJECTS

Hamiltonian Neural Network: Physics-Informed Neural Networks

June 2024 – Ongoing

MATLAB: Optimizing thermodynamical quantities in a syringe with PDEs

September 2022 – February 2023

Stochastic simulation of metmyoglobin/peroxide redox cycling mechanism

December 2022 – February 2023

SKILLS

Languages: Python, CSS/HTML (Elementary)

Laboratory skills: Analytical chemistry; ELISA, GC, MS

Libraries: NumPy, Pandas, SymPy, Scikit, PyTorch

Sports: Tennis (#1 U18s nationally)