Nhut Hung Nhan

Ottawa, Ontario
343-297-6643 • howlnhan2003@gmail.com • nhannhuthung.github.io
howlnhan • nhannhuthung

Summary

A motivated Mathematics student with background/experience in computational math, numerical computing, programming and scientific research.

Experience

Research Assistant, *Carleton University*, Ottawa May 2025 - Current
- Modeling and analyzing quantum wave dynamics in deformed 2D graphene using tight-binding model (Schrödinger base) and finite element approximation model (Dirac base).
- Designing and modifying the model of graphene with lattice deformation for numerical experiments.
- Simulating time-dependent wave propagation using Kwant/tkwant.
- Integrating finite element modeling using FEniCS to solve PDEs and validate deformation models.
- Enhancing results of a time-independent tight-binding solver to compute eigenvalues, band structures, and local density of states (LDOS) for spectral analysis.

Teaching Assistant, *Carleton University*, Ottawa Aug 2023 - Current
- Course Subjects: Ordinary Differential Equations, Mathematical Methods, Mathematical Reasoning, Calculus, and Linear Algebra.
- Math and Stats TA Excellence Award 2024 - 2025.

Research Assistant, *Carleton University*, Ottawa May 2024 - Sep 2024
- Utilized Physics-Informed Neural Networks (PINNs) with JAX in Python.
- Demonstrated numerical experiments using MATLAB.
- Enhanced code efficiency for improved computational accuracy and complexity.
- Reviewed and revised research papers.

Skills

Programming:
- Python, Java, SQL, C, C++.
- MATLAB, R, Maple, Sage, CGSuite, LaTeX.
- HTML, CSS, JavaScript.
- Excel, VBA, Macros.

Libraries:
- NumPy, Matplotlib, Pandas.
- JAX, Scikit-learn, PyTorch.
- FEniCS, Pybinding, Kwant.
- MPI.

OS & Tools: Linux, Git, CLI.

Projects

- Experimented with multiple regression models (Linear Regression, KNN, Decision Trees, Random Forest, SVR, Gradient Boosting) using Scikit-learn to predict. Evaluated performance using MAE, MSE, R^2-score and MAPE.
- Implemented a neural network with NumPy to recognize handwritten digits (MNIST dataset) using tanh, softmax and gradient descent.
- Analyzed token growth and hallucination risks in LLMs using Python and DeepInfra API.
- Built VBA macros to automate complex workflows with conditional branching.
- Implemented MPI-based Finite Difference Schemes in C++ and visualized outputs in MATLAB.
- Developed and maintained a website for the CU Math & Stat Society using HTML, CSS, JavaScript.

Education

Carleton University Sep 2025 - Current
Master of Science: Mathematics.

Carleton University Sep 2021 - Apr 2025
Bachelor of Mathematics Honours: Concentration in Applied Analysis.
- CGPA: 11.35/12 → GPA: 3.9/4 → 94.6%.

Publications

Emmanuel Lorin and **Howl Nhan**. Data-driven fractional algebraic system solver. *Mathematics and Computers in Simulation*. 236:170–182, 2025.