NGUYEN HONG PHUC

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EDUCATION

VinUniversity — Ha Noi, Vietnam
Bachelor of Science in Electrical and Computer Engineering — *Oct. 2023 – Present*

- **Cumulative GPA: 3.72/4.00 (Rank 1 in ECE Cohort 4)**
- **Honors:** 2 times President's List (AY 23-25), Dean's List (All Semesters), 100% Talent Scholarship (2023–2027).
- **Awards:**
  - Gold Medal – WorldQuant Challenge.
  - Silver Medal – The University Physics Competition 2024.
  - Finalist – 2025 Quantum Global Industry Challenge (Connected DMV).
  - Finalist – IoT Challenge 2025 (FPT Software).

Bac Ninh High School for the Gifted — Bac Ninh, Vietnam
Physics Major — *Aug. 2020 – May 2023*

- **GPA: 9.6/10**
- Selected Awards: Second Prize National Physics Olympiad (2023), Gold Medal High School Olympiad (2021-2022), 5th Place Worldwide Thomas Jefferson Physics Olympiad (2023).

TECHNICAL SKILLS

Languages: Python, C/C++, Verilog, MATLAB, LaTeX
Frameworks/Libraries: PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, OpenCV, PennyLane, Qiskit
Tools & Platforms: Docker, Git, Vivado, Altium, PSpice, CVX, Arduino, Raspberry Pi, Linux

PUBLICATIONS

[1] **Phuc H. Nguyen**, T. T. Nguyen, S. H. Wanasekara, N. M. Ngo, D. V. Dzung and V.-D. Nguyen, "AquaSC: Task-Oriented Semantic Communication for Efficient and Intelligent Aquaculture IoT Systems," in *IEEE Transactions on Emerging Topics in Computational Intelligence* (**Under Review**). **[Preview Manuscript]**

[2] N. M. Ngo, T. T. Nguyen, **P. H. Nguyen** and V.-D. Nguyen, "Energy-Aware Resource Allocation for Energy Harvesting Powered Wireless Sensor Nodes," in *IEEE Communications Letters*, vol. 29, no. 3, pp. 542-546, March 2025.

[3] **H.-P. Nguyen**, T.-T. Nguyen, et al., "A Digital Healthcare Platform for Cardiovascular Disease Management: Architecture, Technology Integration and Deployment in Vietnam," in *Open Innovation Conference Proceedings*, 2024, p. 419.

[4] A. M. Tran, Q. N. Duong, D. V. Vo, K. T. Pham, **P. H. Nguyen**, and C. D. Do, "Low-Cost Triboelectric Nanogenerator for Wind Energy Harvesting in Urban Areas," in *Open Innovation Conference Proceedings*, 2024, p. 332.

[5] S. H. Wanasekara, ..., **H.-P. Nguyen**, et al., "Sustainable Smart Mariculture System: IoT-Based Water Quality Monitoring and Pollution Reduction in Aquaculture," in *Open Innovation Conference Proceedings*, 2024, p. 305.

WORK EXPERIENCE

Undergraduate Research Assistant — Oct. 2023 – Present
Intelligence, Computing and Communication Lab (ICCL) | VinUni — *Ha Noi, Vietnam*

- Investigated Open RAN architecture, 5G networks, and Task-Oriented Semantic Communication under Supervisor Nguyen Van Dinh.
- Developed multi-modality AI models for smart aquaculture, implementing Computer Vision algorithms for fish tracking, underwater size estimation, and image segmentation.
- Exploring Diffusion Models for enhanced data generation and signal processing applications.

Project Intern (Top 20 Finalist IoT Challenge) — May 2025 – Sep. 2025
FPT Software — *Ha Noi, Vietnam*

- Deployed Quantized LLMs on Raspberry Pi to create a conversational conservation chatbot.
- Implemented A* pathfinding algorithms for autonomous navigation optimization.
- Engineered a full-stack solution (Frontend/Backend) for real-time shopper tracking and route optimization.

Research Consultant Sep. 2024 – May 2025

WorldQuant *Remote*

- Developed predictive mathematical models (Alphas) to forecast financial instrument price movements.
- Utilized statistical analysis and historical data to optimize trading signals.

Projects

Smart Aquaculture System | *IoT, AI, Computer Vision* In-Progress

- Integrating IoT and AI technologies for sustainable resource management in alignment with Vingroup's smart city initiatives.

WinCart | *Edge AI, Raspberry Pi, Silicon Labs* Completed

- Engineered an AI-powered smart shopping assistant enabling hands-free experiences.
- Implemented Real-Time Positioning via ML on Silicon Labs hardware and a full-stack Edge AI pipeline.

Neural Network From Scratch | *C++, C, Mathematics* Completed

- Implemented a Convolutional Neural Network (CNN) in C++ and a Feedforward NN in C for MNIST classification without external ML libraries.
- Demonstrated deep understanding of backpropagation, matrix operations, and optimization algorithms.
- GitHub: CNN (C++) | NN (C)

AquaSense | *Embedded Systems, Arduino, Mobile App* Completed

- Designed a water quality monitoring system (pH, Temp, NH_3, NO_2, DO) with real-time mobile/web alerts.
- GitHub: Link

Certificates & Courses

Specializations: Digital Signal Processing (EPFL), Neural Networks and Deep Learning (DeepLearning.AI), Wireless Communications (Yonsei Univ).
Other: Open RAN 101, Quantum101, Introduction to Optimization (VinUni).

Languages

Vietnamese: Native | **English**: Working Proficiency | **German**: Beginner