Vu Hoang (Gary) Pham

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Education

Drexel University, Pennoni Honors College, College of Engineering — Philadelphia, PA
M.S in Computer Engineering — Graduation: Jun 2027
B.S in Computer Science, Minors in Computer Engineering & Mathematics — Graduated: Jun 2025
Concentrations: Computer System & Architecture, Algorithms & Data Structure — GPA: 3.72 - Dean's List

Skills

Languages: C, C++, Python, Java, Racket, Haskell, Bash, Kotlin, Go, Rust, Pascal, SQL, Assembly (x86)
Tools: CUDA, CMake, VsCode, IntelliJ, Git, UNIX, CCS, Arduino, UML, DrRacket, Docker, AWS, Clang, GCC
Systems: Windows, Linux (Ubuntu, Mint, Kali, Raspberry Pi), MacOS, Plan 9, Android
Frameworks: Django, Node.js, Angular, Spring

Work Experience

Medcrypt — Solana Beach, CA, US
CO-OP Embedded Software Engineer — Apr 2024 - Sep 2024

- Designed and implemented an optimized ASN.1 encoder/decoder in C for STM32 microcontrollers, reducing the firmware footprint by **30%** (from 64 KB to 45 KB) and boosting encoding throughput by **40%**.
- Identified and resolved **150,000+ namespace symbol** conflicts in a **2 MB vendor codebase**, eliminating CI build failures and cutting integration **debugging time by 50%**.
- Integrated hardware-accelerated AES encryption on the STM32 platform, slashing cryptographic **processing latency by 25%** and ensuring deterministic performance for real-time data protection.

FPT Software, OCR Quy Nhon Team — Hanoi, Vietnam
Internship A.I Researcher & Engineer — Jun 2022 - Sep 2022

- Developed and fine-tuned a CNN-based OCR pipeline in Python (NumPy, Matplotlib, Pandas) trained on **50,000** Japanese Kanji samples, boosting character recognition accuracy from **77% to 92%**.
- Pruned and quantized the model to cut inference time **from 200 ms to 80 ms** per image **(-60%)**, enabling real-time OCR on resource-constrained devices.
- Integrated OCR into an Angular web app, processing up to **2000 scanned images per minute** and tripling throughput in end-user.

Research

FPGA Compiler for Nested Loop Acceleration — Drexel Master Research
Hardware Researcher — Jun 25 – Present

- Designed LU decomposition and matrix factorization arrays on Xilinx FPGA (Zybo Z) using Vitis HLS and AXI-Stream IP, **achieving x2.3 speedup** over baseline C implementation.
- Compiled nested loop kernels into 64-PE arrays with **> 90% pipeline utilization** and verified through cycle-accurate simulation.
- Evaluated synthesis results via C/C++ and VHDL testbenches, optimizing DMA throughput by **35%** through bus-width and latency tuning.

Lexicographically Minimum String Rotation — Drexel Senior Project
Quantum Researcher — Sep 24 – Jun 25

- Architected and implemented a quantum LMSR algorithm in Qiskit using Grover's amplification, reducing theoretical search complexity from $O(N \log N)$ to $O(\sqrt{N})$ for N quibits this translates to **~320** fewer oracle calls.
- Simulated and deployed the **6-qubit** LMSR circuit on IBM Quantum hardware, executing **100 runs across 20 problem instances** with an average **≥ 97% success rate**, and validated against classical benchmarks.
- Applied the algorithm to benzenoid edge code recognition over **50 molecular graphs** for Drexel's Week of Excellence, slashing end-to-end **processing time by 30%**.

Robust and Risk-aware Planning for Autonomous Vehicles in Smart Cities — Drexel VIP Research
Embedded Researcher — Jul 24 – Jun 25

- Integrated ROS2 middleware for real-time communication among autonomous vehicles, reliably streaming sensor and control data at up to **50 Hz** across a distributed network.
- Built and enheanced a scalable autonomous vehicle (AV) control system leveraging ESP32 boards, achieving a **35% reduction in system latency** through efficient C kernel implementation.
- Built a smart-city for **100+ concurrent AVs**, achieving **90% threat-detection accuracy** under adverse conditions.

Design Project

Good Meal - Better Healthcare Better Life — Drexel DragonHacks 2023
Full-Stack Programmer

- Constructed a responsive web application using JavaScript and Node.js, integrating 3 distinct healthcare-related APIs (Nutritionix, Edamam, OpenFDA) with a data retrieval **latency reduction of 25%.**
- Fine-tuned ChatGPT language models to enhance user satisfaction ratings by **30% in pilot tests**.
- Crafted an interactive UI with accelerated animations and images, resulting in a **40% faster page** load time.

Activities

Participant, ICPC USA Regional Contest
Varsity Player, Drexel Badminton Club, Hanoi Swimming Team