

# Xin Hung Chan

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## EDUCATION

### University of Massachusetts, Amherst

Amherst, MA

*Computer Engineering (BS), Mathematics (BS)*

*Sept. 2023 – May 2027*

- **GPA:** 3.9/4.0
- **Dean's List:** Fall 2023 – Present
- **Computer Engineering Coursework:** Data Structures, Hardware Organization, Computer Networks, Embedded Systems, Signal Processing, Artificial Intelligence, VLSI, Systems Programming, Hardware Design for Machine Learning
- **Mathematics Coursework:** Statistics, Linear Algebra (Graduate), Discrete Math, Multivariable Calculus, Mathematical Modeling

## EXPERIENCE

### Vice-Chair, Dean's Advisory Board

Sept 2024 – Present

*College of Engineering*

*Amherst, MA*

- Co-led monthly meetings with the Dean to develop and implement initiatives that fostered a stronger sense of community within the College of Engineering.
- Proposed and organized signature events, including an Engineering Formal, pitch competitions, and developing a community hub website to connect students and promote involvement.

### Private Tutor

June 2024 – Aug 2024

*MindFlex Education*

*Singapore*

- Provided one-on-one tutoring in Calculus, Physics, Biology, and English to high school and college students.
- Customized lesson plans to meet individual student needs, and improved students' average grades from a C- to a B in 6 weeks.

## PROJECTS

### LC-3 Virtual Machine | *C, Assembly, Systems Programming*

June 2025 – July 2025

- Implemented a virtual machine for the **LC-3 architecture** from scratch in **C**, including instruction decoding, memory management, register simulation, and I/O trap handling.
- Built an **interactive debugging interface** with support for step execution, breakpoints, and real-time register/memory inspection.
- Developed a **custom assembler** to convert LC-3 assembly code into executable machine code.

### Network Traffic Anomaly Detection | *Python, Machine Learning, Networks*

Aug 2024 – July 2025

- Developed and compared **supervised** (Random Forest, XGBoost) and **unsupervised** (Isolation Forest, Autoencoder) models to detect anomalies in network traffic using the CICIDS2017 dataset
- Achieved **96.69%** AUC with XGBoost and **92.82%** accuracy using Random Forests by engineering flow-based network features and performing time-series traffic analysis.
- Visualized model performance using ROC curves, confusion matrices, and **t-SNE clustering**.

### Monte Carlo Option Pricing on FPGA | *Finance, Verilog, Hardware Acceleration*

July 2025 – Aug 2025

- Implemented a Monte Carlo simulation for European option pricing using **Geometric Brownian Motion** in **SystemVerilog** on a Xilinx Spartan-7 FPGA.
- Meshed principles of **stochastic modeling**, pipelining, and **parallel programming** to optimize random number generation and maximize throughput.
- Wrote statistical convergence checks to ensure accuracy of pricing under varying volatility and drift conditions.

## TECHNICAL SKILLS

**Languages:** Java, Python, C/C++, PostgreSQL, JavaScript, HTML/CSS, MATLAB

**Frameworks:** React.js, Node.js, MongoDB, Git, Excel, CUDA, AWS, PyTorch, FastAPI, Valgrind

**Hardware:** FPGA Design, ARM Assembly, SystemVerilog, Linux