

# Guanghao Xu

224-288-7818 | Email: gxu24@illinois.edu | www.linkedin.com/in/guanghao-xu-8354b930b | https://github.com/GuanghaoXu

## EDUCATION:

### University of Illinois Urbana-Champaign, Grainger College of Engineering

Master of Electrical & Computer Engineering (GPA 3.67)

Jan 2025 - Present

- Applied Parallel Programming, Artificial Intelligence, Computer Vision, Communication Networks, Cloud Infrastructure.

### University of Illinois Chicago, College of Engineering

Bachelor of Computer Science (GPA 3.78)

Aug 2021 - May 2024

- Operating System, Machine Learning, OOP, Systems Programming, Computer Algorithm, Software Engr, User Interface.

## WORK EXPERIENCE:

### Midea America Research Center (MARC)

Electrical & Software Engineer | Co-op

Jan – Present 2026

Louisville, Kentucky

- Developing optimization control algorithms and software tools based on **PI control** for variable-speed **HVAC** systems, designing a **simulation** environment for system testing, and using multiple models for data training and analysis.

### SLB (Schlumberger)

Full-Stack Software Developer | Intern

Aug - Dec 2025

Houston, Texas

- **Full-Stack Project:** [SLB Proxy Modeling Platform – Web-Based Pressure Vessel Analysis App](#)

- Enabled **multi-user management** and **FastAPI** server communication through **JWT authentication** and **bcrypt hashing**.

- Implemented a **calculation engine** in Python 3.12, providing real-time computations, evaluations, and dynamic plotting.

- Built a responsive **JavaScript/HTML/CSS frontend** with dynamic unit conversion, result visualization, and file export.

- **Cloud deployed** using **Gunicorn + Uvicorn** on **Azure App Service**, with **Azure MySQL Flexible Server** storing user credentials and calculation history.

### Clounix Technology Limited

System Development Engineer | Intern

May - Aug 2025

Shanghai, China

- **Project:** [Clounix - Multi-Axis Probe Station for PCB Verification in Chip Integration](#)

- Implemented 8-axis motor control via **Modbus RTU** for PCB probe station, incorporating **PID-based** auto-calibration, optical/pressure sensor feedback, collision detection, and emergency stop for robust closed-loop operation.

- Developed multi-axis **motion algorithms**, including calibration, collision-avoidance, and emergency-stop mechanisms.

- Designed a **layered architecture** supporting **simulation-hardware dual-mode, multithreading, and asynchronous scheduling**; developed comprehensive **unittest** suites to ensure stability and reliability.

- Designed and implemented **full-stack** solutions, including secure **RESTful APIs** over **HTTP** using the **FastAPI** Web framework, incorporating **middleware management** for authentication, logging, and error handling. Designed a **user-friendly GUI** enabling interaction with backend services for runtime configuration, task scheduling, and data management.

- Applied **Computer Vision integration (OpenCV)** for image-based probe positioning, alignment and zero-point calibration.

### Newland AIDC

Software Engineer | Intern

Jun - Aug 2023

Fuzhou, China

- Developed **B2B verification and hardware-testing tools**, featuring a user-friendly GUI with **PyQt5** and **Qt Designer** for real-time visualization and control of embedded scanner diagnostic metrics.

- Built backend services using **Node.js (Express.js)** and **MongoDB**, designing **RESTful APIs** for multi-user authentication, test data & database management, and seamless system integration.

## PROJECTS :

### CUDA-Optimized Convolutional Neural Network – Parallel Programming Individual Project

- Accelerated convolutions via tiled matrix multiplication with **input unrolling, shared memory**, and **kernel fusion**, reducing global memory load from **84.9% → 23.6%**. Applied **Tensor Cores** (TF32 WMMA), **CUDA Streams** with **pinned memory overlap**, and **FP16 arithmetic** for high-throughput execution.
- Profiled with **Nsight Systems** and **Nsight Compute** to guided targeted memory and compute optimizations, achieving end-to-end inference speedup from **1623 ms → 52 ms (batch size 10,000)** while maintaining accuracy.

### Breast Cancer Tumor Classification – Machine Learning Group Project

- Developed and compared **KNN, LR, SVM, FNN, and DT** models using the Breast Cancer Wisconsin dataset.
- Applied **normalization and PCA**; tuned **hyperparameters** with grid search and **5-fold cross-validation**.
- Achieved **98.25%** test accuracy with SVM and **93.86%** with KNN; tracked **precision, recall, F1-score, and visualized confusion matrices**. Measured inference latency and memory to evaluate real-time feasibility.

### Accelerated Large-Scale Circuit Simulation (OpenMP & CUDA) -- Electronic Design Automation Research Project

- Accelerated large-scale circuit simulation by parallelizing and optimizing core numerical kernels with **OpenMP** and **CUDA**, achieving **36×** speedup over the serial baseline through parameter tuning, systematic benchmarking, and CPU/GPU profiling with CUDA tools (**Nsight Systems, Nsight Compute**).

### Fine-Grained Image Classification via Visual Backbone Evaluation -- Computer Vision Research Project

- Evaluated multiple visual backbones for fine-grained classification, analyzing accuracy and efficiency in dog breed ID.