

Boyang Song

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EDUCATION

Cornell University

Master of Engineering, Computer Science; GPA: 3.51/4.00

Ithaca, NY

2023 – 2024

Arizona State University

Bachelor of Science, Computer Science; GPA: 4.00/4.00, Summa Cum Laude

Tempe, AZ

2020 – 2023

EXPERIENCE

Smart IoT Device Startup

Founding Engineer

Remote

April 2025 – Present

- Designed and developed a scalable, modular backend architecture capable of handling over 100,000 concurrent device connections, which successfully supported the product's first production batch.
- Designed and implemented a private binary communication protocol and end-to-end encryption scheme between the device and cloud, ensuring efficient and secure data transmission.
- Developed and deployed multi-platform clients (App, Web, and WeChat Mini Program) to provide a unified user interaction and device control experience.

PROJECTS

Machine Learning-Driven Sales Management & Analytics Platform

- Engineered a unified sales platform that integrates daily business operations (e.g., order processing, inventory control) with its function as a central data-collection engine for machine learning applications.
- Designed and implemented a data pipeline to process this proprietary dataset, which feeds into a suite of machine learning modules that transform raw data into strategic intelligence:
 - Predictive Forecasting: Deployed an LSTM model that integrated dynamic variables to generate accurate sales forecasts, directly guiding production planning and inventory control strategies.
 - Cross-Sell Intelligence: Implemented Market Basket Analysis on transaction data to discover high-affinity product combinations, directly informing product bundling strategies.
- The AI-driven approach to analyzing internally-sourced data provides actionable insights for inventory optimization and targeted customer marketing.

High-Performance Parallelization of Graph Algorithms Using MPI and CUDA

- Engineered a high-performance graph computing framework on NERSC's Perlmutter, featuring serial, MPI-distributed, and CUDA-accelerated modules to support large-scale network analysis.
- Realized over $5\times$ speedup with MPI through strategic workload partitioning and over $10\times$ acceleration with CUDA by migrating parallel computation kernels to the GPU.
- Conducted in-depth analysis of performance trade-offs for different graph representations in dense and sparse scenarios, directly informing optimizations in memory-sensitive environments.

Transportation Electrification Simulation Platform

- Partnered with Cornell's Civil & Environmental Engineering group to architect and deploy a scalable simulation platform for nationwide transportation electrification.
- Engineered RESTful services in Python Flask to orchestrate simulation workflows, manage parameter configurations, and support high-volume data exports.
- Developed an interactive React visualization suite with dynamic mapping, real-time charting, and user-driven controls for comprehensive analysis and reporting.

TECHNICAL SKILLS

Programming Languages: C, C++, Python, Java, C#, JavaScript, Swift

Frameworks & Libraries: PyTorch, NumPy, Transformer, CUDA, MPI, React, Flask, Spring Boot

Tools & Platforms: PostgreSQL, MySQL, Unity, ROS, Git, Linux, Nginx

Technical Domains: Machine Learning, Artificial Intelligence, High-Performance Computing, Computer Graphics, Robotics, Data Visualization, Large Language Models