Troy Conner Allen

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Education

Georgia Institute of Technology – MS in Computer Science (4.00/4.00 GPA)

Aug 2024 - Dec 2025

• Coursework: GPU Hardware and Software, Natural Language Processing, Operating Systems, Machine Learning

Georgia Institute of Technology – MS in Analytics (3.78/4.00 GPA)

Aug 2022 - Aug 2024

Florida State University – BS in Computer Science (3.81/4.00 GPA)

Jun 2017 - Dec 2021

Experience

Software Engineer Intern, Trideum Corporation - Atlanta, GA

Dec 2024 - Present

- Engineered multimodal AI platform processing 290,000+ files using computer vision, NLP, and CUDA with 12+ Docker microservices in Python for government data analysis
- Reduced hybrid search latency 80% by optimizing Milvus vector database with dynamic IVF and HNSW indexing
- Enhanced BERTopic performance 2x through multi-threaded batch processing using PyTorch and POSIX threading
- Built metadata filtering system with exact/fuzzy matching enabling targeted search across file types, dates, etc.
- Implemented backend LLM streaming reducing query response times 3-4x for improved user experience

Software Engineer Intern, Shepherd Center – Atlanta, GA

May 2024 - Dec 2024

- Developed neural network architecture for pressure ulcer prediction in spinal cord injury patients achieving 93% accuracy using Python/PyTorch with performance optimization
- Reduced API response time 60% by implementing containerized Flask endpoints with Redis caching
- Built real-time clinical dashboard processing 400+ patient datasets using machine learning pipelines with scikit-learn

Research Assistant, Florida State University - Tallahassee, FL

Jan 2019 - May 2022

- Secured \$289k NIJ research grant by designing database schema and framework for mass shootings analysis
- Reduced research time by 20 weeks by creating OCR/NLP pipeline in C++ for data extraction with OpenCV
- Built automated hate speech detection pipeline for Discord communities using fine-tuned BERT models achieving 89% classification accuracy on 50K+ messages

Lead Teaching Assistant, Florida State University – Tallahassee, FL

Jul 2020 - Dec 2020

• Achieved 100% rating from 75+ students developing C++ curriculum with system-level programming focus

Projects

Memory Allocator | C++, Assembly, Cache Optimization

- Developed a dynamic memory allocator in C++ that runs 2x faster than glibc on specific tasks
- Optimized for cache efficiency using bitwise intrinsics, minimal metadata (< 4%), and prefetching techniques

Al Basketball Coach | Python, OpenCV, MediaPipe, Gemini API

- Developed real-time basketball shot analysis system using MediaPipe pose estimation and computer vision
- Integrated Gemini API for automated shot feedback generation with 4-second overlay display and real-time statistics

Raft-Based Distributed Database | Rust, Raft Consensus, gRPC, Docker

- Engineered fault-tolerant distributed database supporting ACID transactions across 5+ nodes
- Implemented Raft consensus protocol achieving 99.9% availability with automated leader election and log replication

Skills

Languages: Python, C++, Rust, Java, JavaScript, SQL

Frameworks: PyTorch, TensorFlow, CUDA, FastAPI, Flask, React, Docker

Tools: Git, Linux, AWS, PostgreSQL, MongoDB, Redis, Milvus

Concepts: Machine Learning, NLP, Distributed Systems, Backend Development, Data Structures & Algorithms