Torrin Conrath

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Education

Virginia Tech — Alexandria, VA
M.Eng. Computer Science and Applications, Concentration: Data Analytics and AI, GPA 4.0 — *Aug. 2025 – May 2026*

Virginia Tech — Blacksburg, VA
B.S. Computer Science, GPA 3.9 — *Aug. 2022 – May 2025*

Relevant Courses: Data Structures and Algorithms, Computer Organization, Computer Systems, GUI and Graphics, Artificial Intelligence, Machine Learning, Deep Learning, NLP, Social Media Analytics

Professional Experience

Software Development Engineer — May 2024 – March 2025
Radyn Inc. — *Bethesda, MD*

- Developed PHP scripts to refactor legacy code and streamline database management, reducing administrative task time by 98% (from 5 hours to 5 minutes).
- Optimized legacy algorithms and ETL processes ensuring 99.9% data integrity.
- Engineered a specialized AI deep neural network to identify optimal paths, achieving a 60% R^2 score for predictive accuracy using over 280k+ historical records.
- Led technical routines and database check-ups using Agile methodologies to ensure all deliverables met high-quality standards.

Technical Projects

Real-Time Pest Detection Application on Edge Devices

- Engineered a YOLOv8 real-time pest detection system, achieving 99.4% accuracy in baseline tests by training on a custom-curated and preprocessed dataset of 1,500+ images.
- Designed and implemented a synthetic stress test to validate model robustness against adverse, real-world edge conditions.
- Optimized the model for edge deployment by utilizing TFLite float16 quantization and benchmarked performance on a Raspberry Pi 3B+, analyzing hardware limitations.
- Developed a full-stack monitoring application featuring a React dashboard and Flask backend system to provide real-time video feed, detection alerts, and performance metrics.

Medically-Trained LLM with Older Patient Design

- Architected a FastAPI application that simplifies complex medical jargon to plain English, featuring UX tailored for older-patient usability.
- Integrated multimodal accessibility features, including Tesseract.js OCR for document uploads and real-time voice transcription, to support diverse user needs.
- Fine-tuned a Qwen-8B model using SFT and LoRA on a curated dataset of 20,000 doctor-patient dialogue, ensuring medical accuracy and context-aware simplification.
- Accelerated model inference by integrating vLLM and implementing AWQ quantization with the MARLIN kernel, enabling real-time performance on consumer hardware.
- Achieved a 48.5 SARI score, matched of exceeded proprietary models in clarity, and earned a 4.5/5 rating in a human-centered usability study while maintaining real-time latency on consumer hardware.

AI-Powered Car Value Prediction Mobile Application

- Engineered a PyTorch regression model with an NLP pipeline to predict car values from unstructured user text descriptions.
- Constructed BeautifulSoup (BS4) Web parsers to continuously gather current car data and market trends, providing up-to-date information for model training and users.
- Deployed a scalable backend using a Flask API and MySQL database on AWS, leveraging Gunicorn and ngrok to simulate production-level testing.
- Implemented systemd services to guarantee server uptime and automate daily web scraping tasks.
- Packaged and distributed the mobile application by generating an Android APK using Expo Dev.

BURGs Organization Web Application

- Collaborated on a multiview, full stack web application for BURGS Recruiting using the MERN stack and Docker.
- Implemented thorough testing, debugging, and agile methodologies with stakeholders to fulfill exact requirements and routine progress updates.

Technical Skills

Languages: Python, Java, JavaScript/TypeScript, SQL, C, PHP, HTML/CSS, R
Frameworks/Tools: PyTorch, TensorFlow, BS4, FastAPI, vLLM, YOLO, OpenCV, TFLite, ONNX, React, Flask, Tesseract.js, Node.js, Express.js, AWS, Docker, Kubernetes, Git, MySQL, MongoDB, PostgreSQL
Concepts: Machine Learning, Large Language Models, Computer Vision, Object Detection, Edge AI, Fine-tuning (SFT/LoRA) Model Quantization, Natural Language Processing, Neural Networks, Data Structures, CI/CD, Data Management, Application Development, Agile Methodologies