Randy Hannah

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EDUCATION

The University of Alabama
Bachelor of Science in Computer Science ***May 2026***
Relevant Courses: Computer Algorithms, Database Systems, Data Science, Mathematics for AI, Reinforcement Learning

TECHNICAL SKILLS

Languages: Python, C++, C, Java, SQL, JavaScript, HTML, CSS
AI/ML: PyTorch, TensorFlow, OpenCV, Hugging Face, NumPy, Pandas
Cloud & DevOps: Linux, Google Cloud Run, Docker, CI/CD, REST APIs, Flask
AI Systems: Embeddings, Semantic Search, Vector Search, Retrieval Systems
CS Concepts: Computer Vision, GPU Computing, Data Structure and Algorithms, Object-Oriented Programming, Performance Optimization

RESEARCH EXPERIENCE

Undergraduate Researcher – AI & Data Systems ***Jan 2026 – Present***
Advisor: Jiaqi Gong, PhD
- Conducting research on large-scale data integration and semantic search systems
- Designing dataset pipelines and structured resource catalogs for AI-driven applications
- Exploring embedding-based retrieval and vector similarity methods
- Collaborating on system design for real-world deployment of AI-powered search systems

PROJECTS

UA Semantic Search System (AI + Backend + Cloud)
- Built a semantic search engine using transformer-based embeddings for university resources
- Developed FastAPI backend for query encoding and top-k retrieval via vector similarity
- Reduced query latency from ~5s to <1s using precomputed embeddings and vectorized search
- Containerized with Docker and deployed on Google Cloud Run
- Integrated frontend with backend API, handling CORS and production deployment
- Debugged production issues including model loading, dependency resolution, and cloud logging

Vision-Based Autonomous Drone System (Capstone)
- Developing a ROS 2 autonomous control system for a DJI Tello drone, integrating perception, decision-making, and flight control
- Integrating external vision inputs (AprilTag tracking via Raspberry Pi camera) to support localization and navigation logic
- Designing and testing autonomous flight behaviors (takeoff, movement, landing) with real-time feedback
- Collaborating within a cross-functional capstone team, coordinating software integration, testing procedures, and system validation

TinyGPT Language Model (From Scratch)
- Implemented a character-level transformer language model in PyTorch from scratch
- Built multi-head self-attention with causal masking and scaled dot-product attention
- Designed token/positional embeddings and stacked transformer blocks with residual connections
- Trained on Shakespeare dataset and analyzed sequence generation behavior

Food Image Classification with PyTorch
- Built and trained a CNN-based image classification pipeline using PyTorch, including preprocessing, augmentation, and evaluation
- Analyzed learning curves to guide model and hyperparameter tuning
- Leveraged data augmentation and regularization techniques to improve model generalization and reduce overfitting

EXPERIENCE

FASTSIGNS of Tuscaloosa ***Jan 2025 – Jan 2026***
Automation & Production Technician
- Designed and implemented automation pipelines using shell scripting to reduce manual production workflows
- Built batch file-processing systems to streamline design-to-production operations
- Identified bottlenecks and optimized workflows, improving turnaround time and reducing errors
- Standardized repeatable processes, minimizing human intervention and increasing reliability