Jubal Bewick

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Summary

Aspiring Full Stack Engineer with a strong foundation in AI/ML applications and Large Language Model development. Demonstrated ability in building production-ready RAG systems and scalable AI platforms, with expertise in deploying LLM-based applications. Eager to leverage deep learning and NLP skills to contribute to innovative full stack solutions.

Education & Certifications

Northeastern University, MA **May 2026**
Master of Science, Computer Science
- **GPA:** 3.94
- **Achievements:** Expected in 05/2026

Bastyr University **2014**
Master of Science, Acupuncture & Oriental Medicine

Bastyr University, WA **2014**
Bachelor of Science, Natural Health Sciences

AI & NLP Projects

Production RAG System & LLM Application Platform
- Engineered a scalable Retrieval-Augmented Generation platform using OpenAI GPT models, ChromaDB vector database, and FastAPI backend.
- Implemented semantic similarity search, document embedding generation, and real-time performance benchmarking.
- Deployed asynchronous application handling concurrent requests with comprehensive analytics dashboard and automated testing suite.

Large Language Model Integration & Optimization
- Developed full-stack applications integrating LLMs with document retrieval systems for question answering and content summarization.
- Optimized embedding generation and vector search algorithms for real-time performance, supporting multiple document formats and complex query processing.

Semantic Search & Content Retrieval System
- Built advanced document processing pipeline with automated chunking, embedding generation, and similarity-based retrieval.
- Implemented performance monitoring, query optimization, and scalable deployment architecture for production environments.

Real-Time Data Processing Application
- Designed Java application using MVC architecture with Alpha Vantage API integration for financial data processing.
- Implemented GUI-based visualization with multiple data persistence options and real-time performance optimization for concurrent data streams.

Test-Driven Development & Automation
- Integrated comprehensive JUnit testing framework within TDD methodology, achieving full test coverage and automated GUI component testing for robust application reliability.

Advanced Unsupervised Learning for Data Reduction
- Engineered unsupervised learning algorithms for computational resource optimization in medical imaging and pattern recognition.
- Implemented PCA, MDS, and t-SNE for dimensionality reduction with K-Means and DBSCAN clustering, achieving significant data compression while preserving critical feature information.

Convolutional Neural Networks for Computer Vision
- Developed CNN architectures using TensorFlow for environmental classification tasks, integrating data preprocessing pipelines.
- Applied PCA for image compression and K-Means for color quantization, optimizing model performance while minimizing computational requirements for real-time applications.

Autonomous Systems & Computer Vision Integration
- Led development of autonomous drone platform for environmental monitoring, programming navigation algorithms in Python and C++ with OpenCV integration.
- Currently integrating Google Vertex AI for automated plant analysis in greenhouse automation applications, focusing on end-to-end ML pipeline development.

Technical Skills

- **AI & Machine Learning**: OpenAI API, Large Language Models, RAG Systems, Semantic Search, Vector Databases (ChromaDB), TensorFlow, PyTorch
- **NLP & Deep Learning**: Document Embeddings, Semantic Similarity, Question Answering, Content Retrieval, Language Modeling, CNN/Computer Vision

- **Programming & Deployment**: Python, C++, Java, TypeScript, FastAPI, Docker, AWS, Real-time Optimization, Concurrent Processing
- **Data & Frameworks**: SQL, NoSQL, Node.js, React, Scikit-learn, Pandas, NumPy, Performance Monitoring, Test Automation
- **Software Architecture**: OOP, MVC, Microservices, API Design, Scalable Deployment, Documentation, Agile/Scrum

Certification

- Machine Learning, UT Austin TACC Center (2024)