Bennett Zug

919-798-1090 | bennettzug@gmail.com | https://www.linkedin.com/in/bennettzug/ | https://github.com/bennettzug

Education

North Carolina State University August 2024 – May 2026
B.S in Computer Science, Minor in Mathematics | *3.6 GPA* | *Magna Cum Laude* *Raleigh, NC*
Relevant Coursework: *Automated Learning and Data Analysis, Mathematics of Scientific Computing, Operating Systems, Natural Language Processing, Software Engineering and AI*

Appalachian State University August 2022 – May 2024
Studied Computer Science, Minor in Mathematics | *3.9 GPA* *Boone, NC*
Relevant Coursework: *Data Structures, Introduction to Theoretical Computer Science, Discrete Math, Linear Algebra*

Projects

class-search.com | *Python, Flask, PyTorch, PostgreSQL*
- Developed a web application to search and discover relevant university courses by computing vector embeddings for over 30,000 gathered course descriptions from multiple institutions using PyTorch and pre-trained language models.
- Built a Flask backend to efficiently match user queries against the corpus of course embeddings by leveraging PostgreSQL with the pgvector extension for fast approximate nearest neighbor search.
- Designed an interactive frontend with dynamic content updates to provide a seamless user experience.
- Deployed the Flask web server to production using Gunicorn and Nginx, ensuring high availability and sub-200ms search latency through optimized vector search without external API calls.

AI Redaction Service (Bandwidth) | *React, Flask, Python, Microsoft Presidio, AWS Bedrock, Docker*
- Built an MVP PII redaction pipeline for Bandwidth, a CPaaS company, to automatically scrub sensitive information from call transcripts before storage or downstream use.
- Designed a layered detection system combining Microsoft Presidio regex rules for structured PII and an AWS Bedrock LLM pass for context-dependent PII, replacing identified data with standardized `[REDACTED_<PII>]` tokens.
- Architected the solution as Docker containerized microservices coordinated by a Flask API layer, deployed on AWS ECS, with a React frontend supporting text input, file upload, and per-category redaction configuration.
- Achieved 80%+ redaction accuracy across 13 PII categories including phone numbers, SSNs, credit cards, and names, validated through unit, acceptance, and end-to-end integration testing.

Automated GitHub Issue Labeling | *Python, Transformers, LLM Prompting, DistilBERT, LoRA*
- Designed and evaluated an NLP system to automatically label GitHub issues (bug, enhancement, question) using both fine-tuned transformer models and LLM-based prompt engineering.
- Led LLM prompting and evaluation, comparing prompt-based classification against fine-tuned DistilBERT models in terms of F1 score, stability, latency, and deployment cost.
- Demonstrated that a fine-tuned DistilBERT model outperformed LLM-based labeling while avoiding external API calls, achieving F1 $>$0.93 on manually labeled issues.
- Analyzed failure modes of LLM classifiers, including sensitivity to wording and inconsistent label assignments, motivating the use of smaller, locally deployable models.

Experience

Information Technology Assistant Summers, 2018–2023
St Timothy's School *Raleigh, NC*
- Managed online accounts and prepared education hardware for over 550 students and 100 faculty members.
- Demonstrated strong problem-solving abilities by independently troubleshooting and resolving technology issues reported by staff while providing clear guidance.
- Grew into a leadership role over successive summers by proactively identifying process improvements to enhance overall technology support efficiency.

Youth Coach and Event Belayer October 2021 – January 2023
Triangle Rock Club *Raleigh, NC*
- Effectively communicated safety instructions and climbing techniques to youth and adult climbers in a clear and engaging manner to ensure a secure and enjoyable experience.
- Managed after-school youth programs by coordinating activities, delegating tasks to staff, and ensuring a structured yet fun experience for participants.

Technical Skills

Languages: Python, Java, JavaScript, SQL, HTML/CSS, LaTeX
Frameworks / Libraries: React, Tailwind CSS, shadcn/ui, Spring Boot, Flask, PyTorch, NumPy, Pandas
ML / NLP: Transformers, LLM Prompting & Evaluation, DistilBERT, LoRA, t-SNE, Vector Embeddings
Tools / Platforms: Git, GitHub, PostgreSQL (pgvector), Weights & Biases, VS Code