

Bennett Zug

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Education

North Carolina State University <i>B.S in Computer Science, Minor in Mathematics 3.5 GPA</i> Relevant Coursework: Automated Learning and Data Analysis, Mathematics of Scientific Computing, Operating Systems, Natural Language Processing, Dynamic Systems and Multivariate Control	August 2024 – Present Raleigh, NC
Appalachian State University <i>Studied Computer Science, Minor in Mathematics 3.9 GPA</i> Relevant Coursework: Data Structures, Introduction to Theoretical Computer Science, Discrete Math, Linear Algebra	August 2022 – May 2024 Boone, NC

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.

WolfCafe | React, JavaScript, Java, Spring Boot, Tailwind CSS, shadcn/ui

- Led a complete frontend redesign for a simulated coffee shop ordering and inventory system developed as a semester-long team project.
- Built a modern React frontend using Tailwind CSS and shadcn/ui components, improving layout consistency, accessibility, and overall user experience.
- Implemented dynamic views for order placement, inventory management, and administrative workflows, coordinating closely with backend APIs.
- Contributed to backend development in Spring Boot, including API integration and data model updates to support frontend features.

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

Raleigh, NC

St Timothy's School

- 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

Raleigh, NC

Triangle Rock Club

- 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, L^AT_EX

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