

Bradley Peterson

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SUMMARY

Accelerated Computer Science graduate student with a portfolio in ML and LLM-based projects involving nuanced datasets. Extensive experience in collaborative projects, with skill at communicating complex concepts.

EDUCATION

Bachelor of Science in Computer Science

May 2024

Arizona State University, Tempe, AZ

GPA: 3.57

Relevant Coursework: Applied Linear Algebra, Introduction to Artificial Intelligence, Data Structures and Algorithms, Database Management, Found. of Machine Learning, Engineering Probability and Statistics, Multimedia Info. Systems

Master of Science in Computer Science

May 2025

Arizona State University, Tempe, AZ

PROJECT EXPERIENCE

CS Capstone: Toxic Sentiment Mitigation Research Project

August 2023 – Present

- Fine-tuning 3 large language models (LLMs) via progressive distillation to detect and mitigate toxic sentiment in scientific paper reviews, in collaboration with 4 students and researchers from Mayo Clinic and ASU.
- Developed an automated annotation technique to efficiently build a value-aligned dataset for our models.
- Implemented DeBERTa-based feature extraction and Random Forest classification to categorize sentences into 9 semantic classes and accelerate data collection. Visually verified success via PCA and k-means clustering.

Light Pollution Research & ML Data Analysis

November 2021 - Present

- Fused astrophotography and comprehensive image data analysis of 5,500+ sky-brightness samples to research the spatiotemporal character of artificial light across central AZ.
- Extracting key trends and features from a massive set of multidimensional data, employed machine learning techniques such as DBSCAN, decision trees, and neural-net classification with Keras to derive new insights.
- Presented actionable findings to city councils, directly influencing city lighting objectives.

Conversational Travel-Assistant Web App

April 2023 - July 2023

- Collaborated with business graduates in an extracurricular project, blending technical and communication skills to develop a full-stack, conversational interface for end-to-end travel planning and booking, powered by GPT-4.
- Integrated several travel-related REST APIs to power the Python backend. Created an interactive frontend using React/JavaScript, and HTML/CSS. Streamed responses live via Redis.

Optimized Radiance Modeling Project

December 2023 - Present

- Developed a Python-based geospatial analysis tool to simulate the radiant impacts of a complex road network, applying techniques such as raster data manipulation, NumPy vectorization, and efficient memory management.
- Optimized performance to achieve over a 99% reduction in runtime, utilizing techniques such as Voronoi-density weighted sampling, lookup trees, and parallel processing, significantly improving the simulation's scalability.

ADDITIONAL EXPERIENCE

Data Validator | OFW | Phoenix, AZ

June 2023 - November 2023

- Acted as a liaison between technical and non-technical departments at OFW, translating complex concepts into actionable solutions.

Delegate - East Valley (Volunteer) | DarkSky International

August 2020 - Present

- Present regularly on dark-sky topics to a variety of audiences: conferences, clubs, and city councils.

TECHNICAL SKILLS

- **Programming:** Python, JavaScript, Java, C++, SQL, HTML
- **ML/Data:** PyTorch, TensorFlow, scikit-learn, Keras, DBSCAN, Decision Trees, NLP, Pandas, NumPy
- **Tools, Databases, OS:** Git, GitHub, PostgreSQL, Windows, MacOS, Linux