

Cullen Anderson

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EDUCATION

University of Massachusetts Amherst

BS in Computer Science, BS in Pure Math

Pursuing Accelerated (3+1) MS in Computer Science

Amherst, MA

Graduating: May 2025

Expected: May 2026

- GPA: 3.90
- Graduate Coursework: Ongoing - Advanced Algorithms, Algorithms For Data Science, Advanced Probability Theory, Topological Data Analysis; Completed - Machine Learning, Formal Language Theory, Topology
- Relevant Coursework: Software Engineering, Systems, Graphics, Algorithms, Programming Methodology, Data Structures, Theory Of Computation, Programming In C, Object Oriented Programming, Statistics For CS, Real Analysis, Abstract Algebra, Calc 3, Linear Algebra

EXPERIENCE

Researcher

July 2023 – September 2024

University Of Utah

Salt Lake City, UT

- Leading research on computationally efficient robust statistics on corrupted high dimensional data under low data size, culminating in first-author paper currently under review at TMLR; funded by an NSF grant.
- Performed first wide-scale experimental study of modern robust mean estimation methods; evaluating methods across synthetic, Large Language Model, and deep image model data.
- Extended state of the art algorithm to the low data size regime through a novel theorem, significantly enhancing experimental performance.
- Developed a modular Python library for robust mean estimation, offering a suite of modern algorithms and an extendable experimental infrastructure for researchers and practitioners.

Researcher

June 2024 – August 2024

University Of Houston + INAOE

Puebla, Mexico

- Applied a suite of Multi-Task training methods to finetune a deep Multi-Modal model for Comic Mischief Detection.
- Novelty applied curriculum learning based training methods to boost SOTA performance on Comic Mischief Detection.
- Used PyTorch to implement Multi-Modal deep learning models, Multi-Task training methods, and experimental infrastructure.
- Worked in person at INAOE, a Mexican research institution, and attended NAACL 2024, funded by an NSF grant.

Software Engineering Intern

January 2023 – May 2023

Initiative For Digital Public Infrastructure

Amherst, MA

- Led the development of a deduplication algorithm for Gobo, a social media aggregator combining Reddit, Twitter, and Mastodon into a unified platform with user-controlled algorithms.
- Utilized Python and social media APIs to create a dataset of social media posts across platforms.
- Designed and implemented complex duplicate detection rules in Python, ensuring accuracy and minimizing redundancy.
- Conducted extensive testing and validation of the algorithm across both real and augmented data using unittest.

PROJECTS

Robust Mean Estimation Library | *Python, NumPy, Matplotlib, PyTorch, Hugging Face, SciPy, Cvxpy*

- Developed a suite of robust mean estimation algorithms; synthetic, LLM, deep image model, and GloVe word embedding data generation and corruption schemes; and experimental infrastructure.
- Designed and well-documented with a focus on modularity, enabling future researchers and practitioners to evaluate new algorithms over different data and experimental conditions.

Reddit Sentiment Analysis | *Python, Flask, Keras, Reddit API, HTML/CSS*

- Built a ML sentiment analysis model using Keras on a web application with Flask; the website allows users to perform sentiment analysis on Reddit Subreddits based on popular headlines.

Job Search Website | *Javascript, Node.js, Express, React.js, PostgreSQL*

- Collaborated in a team during a Software Engineering course to develop a full-stack JavaScript job search website, utilizing Agile methodologies.
- As part of backend team, designed and implemeted RESTful API endpoints, optimized database interactions with PostgreSQL, and ensured integration between the frontend and backend using Express and Node.js.

Digit Recognizer Website | *Python, Keras, NumPy, Pillow, Flask, JavaScript, HTML/CSS*

- Implemented a neural network from scratch in NumPy and convolutional neural network using Keras.
- Built image preprocessing pipeline using Pillow, allowing digits drawn on or submitted to the website to be identified.
- Built full-stack web interface using Flask, JavaScript, and HTML/CSS.

SKILLS

Python, PyTorch, Hugging Face, JavaScript, TypeScript, Java, C, NumPy, Matplotlib, HTML, CSS, Flask