Cullen Anderson

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Education

University of Massachusetts Amherst — Amherst, MA
BS in Computer Science, BS in Pure Math — *Expected: May 2025*
- GPA: 3.90
- Relevant Coursework: Ongoing - Algorithms For Data Science, Toplogical Data Analysis, Operating Systems, Complex Analysis; Completed - Software Engineering, Systems, Graphics, Formal Language Theory, Machine Learning, Programming Methodology, Algorithms, Topology, Real Analysis, Data Structures, Theory Of Computation, Programming In C, Object Oriented Programming, Statistics For CS, Abstract Algebra, Calc 3, Linear Algebra

University of Massachusetts Amherst — Amherst, MA
MS in Computer Science, Data Science Concentration — *Expected: May 2026*
- Accepted into Accelerated Master's Program.

Experience

Researcher — July 2023 – Present
University Of Utah — *Salt Lake City, UT*
- Leading research on computationally efficient and practical robust statistics under low data size, culminating in first-author paper currently under review at TMLR.
- Experimentally evaluated modern robust mean estimation methods across synthetic and LLM data, yielding surprising results on performance of existing methods over low data size and real world data.
- Proved theorem allowing for extension of several algorithms to arbitrarily small data size, significantly enhancing experimental performance of several algorithms.
- 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 2023 – August 2023
University Of Houston + INAOE — *Puebla, Mexico*
- Performed experimental study of Multi-Task training methods applied to finetuning pretrained Multi-Modal models.
- Evaluated methods on Comic Mischief Detection, achieving SOTA performance through an original training method.
- Implemented Multi-Modal deep learning models, multitask training methods, and experimental infrastructure in PyTorch.
- Worked in person at INAOE, a Mexican research institution, as part of IRES program funded by an NSF grant, and attended NAACL 2024.

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 comprehensive dataset from various social media posts.
- Designed and implemented complex duplicate detection rules in Python, ensuring accuracy and minimizing redundancy.
- Conducted extensive testing and validation of the algorithm using unittest.

Projects

Robust Mean Estimation Library | *Python, Numpy, Matplotlib*
- Implemented a suite of robust mean estimation methods, synthetic and LLM data generation and corruption schemes, and experimental infrastructure.
- Designed and well-documented with a focus on modularity, enabling future researchers and practitioners to easily evaluate new algorithms over different data and experimental conditions

Reddit Sentiment Analysis | *Python, Flask, Keras, Reddit API, HTML/CSS*
- Implemented a ML sentiment analysis model on a web application using 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, JavaScript, TypeScript, Node.js, Java, C, NumPy, Matplotlib, Keras, SQL, HTML, CSS, Flask