

Mohsin Shah

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Education

University of Massachusetts Amherst

GPA 3.96

Expected Graduation: Dec 2024

- **B.S. in Computer Science** (Artificial Intelligence Track)
- **B.S. in Mathematics** (Concentration: Data Science & Statistics) | Dual Degree

Experience

ML & NLP Research Intern

May 2023 – Present

Professor Jaime J. Dávila | University of Massachusetts Amherst | [Github Code](#)

- Evaluated various transformer based multimodal models such as BLIP, GIT, CLIP, and our custom vision language model (VLM) built with BERT (LLM) encodings, EfficientNet (CNN), and LSTMs with PyTorch to generate prompts given AI generated images.
- Created a custom dataset using Python & Selenium, web scraping 1,000+ AI generated images and prompts.

AI & RNN Research Intern

Feb 2023 – Present

Professor Edward A. Rietman | Biologically Inspired Neural and Dynamical Systems Lab

- Built ML simulations to study the applications and dynamics of reservoir computers built from oscillatory neural networks in Julia.
- Designed tau modulation algorithms, resolving the ongoing challenge of recurrent neural network oversaturation.
- Enhanced data visualization by generating raster plots, difference of lattice output graphs, and video heatmaps; effectively showing the evolution and saturation histories of lattices.

Computer Science + Residential & Academic Peer Mentor

Sep 2022 – Present

University of Massachusetts Amherst

- Devised tailored academic success strategies for 200+ students in their transition to college through academic success mentoring.
- Collaborated with campus organizations to plan and execute events to foster a sense of community and boost engagement by 75%.

AP Computer Science Principles Teaching Assistant

Sep 2019 – June 2020

Blackstone-Millville Regional

- Facilitated the understanding of core computer science concepts for 30+ students through effective communication and assistance.
- Ensured students' understanding of JavaScript by providing guidance in the development of apps and games via Code.org's App Lab.

Projects

Hack(H)er413 Hackathon Winner: Sign Language AI | [signdecoder.com](#) | (Python, OpenCV, Tensorflow, Teachable Machine)

- Awarded "Best Use of AI" by travelers.com for developing an American Sign Language translator using ML & computer vision.
- Led the creation of a custom dataset of 10,000+ images using computer vision algorithms to track and capture our hand gestures.
- Generated an AI model and then used it to classify various signs with over 87% accuracy.

ShareSpace: Roommate Finder Web App | [Github Code](#) | (JavaScript, React, Node, Express, MySQL, AWS RDS, AWS S3, MUI, Tailwind)

- Collaborated with a team of 10 to develop a full-stack web app that matches roommates based on their preferences, allowing matched users to chat and customize their profiles.
- Incorporated AWS RDS & AWS S3 to integrate a MySQL database and store user images to enhance data management security.
- Designed efficient routes and queries for frontend and backend to seamlessly interact with the database.
- Deployed the web app & API while enhancing the UI/UX with engaging animations, creating a dynamic and captivating platform.

eBay: Machine Learning & Name Entity Recognition (NER) Competition | (Python, spaCy, Pandas, NumPy, LLMs)

- Developed a 94% accurate NER model using 10 million raw eBay listings in German; effectively classifying each word.
- Enhanced the data quality and searchability of listings by analyzing and extracting key features with spaCy.
- Conducted data analysis & data cleaning on raw, non-english dataset with Pandas; streamlining feature extraction and performance.

Deep Learning & Reinforcement Learning Flappy Bird AI | [Github Demo](#) | (Python, NEAT, PyGame)

- Created Flappy Bird from scratch by applying OOP whilst simulating physics and collisions with Python and PyGame.
- Implemented the NeuroEvolution of Augmenting Topologies (NEAT) genetic algorithm with evolving artificial neural networks.
- Trained AI birds to be unbeatable by the 11th generation with only 3 inputs states from the environment.

Skills

Programming Languages: Python, Java, JavaScript, Julia, C / C++, C#, SQL, HTML, CSS

Frameworks: React, PyTorch, Tensorflow, Keras, Next.js, Node, Express, Sequelize, Scikit-learn, Pandas, NumPy, Bootstrap, Tailwind

Technologies: AWS RDS, AWS S3, Git, Hugging Face, spaCy, Unity, PyGame, Linux

Courses: Artificial Intelligence, Software Engineering, Data Structures and Algorithms, Computer Systems, Statistics, Linear Algebra, Discrete Math, Multivariable Calc, Ethics & Social Issues in Computing, Software Engineering Project Management

Languages: English, Urdu, Pashto, Hindi

Activities

Member of the UMass Cyber Security Club

Sep 2023 – Present

Member of the UMass Machine Learning Club

Jan 2023 – Present

Member of the UMass Wrestling Club

Nov 2022 – Present

Vice President of the UMass Brazilian Jiu Jitsu Club

Sep 2021 – Present