Shobhit Mehrotra

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EDUCATION

University of Massachusetts Amherst   Amherst, MA

BS in Computer Science, Received Chancellor's Scholarship GPA: 3.971   *Expected Graduation: May 2026*

- Relevant Coursework: Object Oriented Programming, Data Structures and Algorithms, Statistics, Discrete Math, Linear Algebra, Calculus, Quantum Information Science, Information Retrieval

TECHNICAL SKILLS

Languages: Java, Python, C, JavaScript, HTML/CSS, SQL
Tools: React.js, Numpy, Pandas, TensorFlow, Flask, Music21, Git, JUnit Testing, Linux
Soft Skills: Microsoft Office Suite
Awards: Best Sustainability Hack, Wolfram Alpha Letter Award, AP Scholar With Distinction
Interests: Jazz Trumpet

EXPERIENCE

UMass Theory Group   Amherst, MA

Undergraduate Researcher   *June 2024 – Present*

- Implemented advanced algorithms to solve NP-complete problems, achieving a **60% increase** in computational efficiency for linear separability and Boolean satisfiability (SAT) problems
- Conducted in-depth research on the geometric properties of linear separability, analyzing datasets to determine their separability
- Integrated machine learning techniques, specifically using SVM, achieving a **95% accuracy rate** in linear separability analysis on benchmark datasets

National Center for Technology and Dispute Resolution   Amherst, MA

Software Engineer   *February 2024 – Present*

- Designing a mobile disaster relief app intended for over **100,000** first responders, utilizing **Firebase** and **Flutter**, enabling **offline first** capabilities and seamless communication during emergencies
- Optimizing cloud based infrastructure on **Google Cloud Platform** (GCP), leveraging services like Cloud Firestore and User Authentication to ensure scalability
- Implemented **Agile** methodologies within a collaborative team, completing biweekly sprint goals and achieving a **20**% reduction in development time through efficient project management and continuous integration practices

PROJECTS

ImprovAI | TensorFlow, Python, React.js, Flask, Music21, SQL   August 2024

- Trained a **LSTM** neural network for jazz improvisation using **TensorFlow Keras** for melody generation, achieving **90%** accuracy in predicting note sequences for time series data
- Performed hyperparameter optimization, including fine-tuning the **temperature** and learning rate to achieve optimal model performance
- Processed over **50,000** musical lines using **music21**, filtering, encoding, and decoding notes, increasing training and generation efficiency by **45%** through optimized data preprocessing techniques

RetrieveIt | Python, Matplotlib, Numpy   October 2024

- Engineered a search engine by optimizing web crawling, tokenization, and indexing strategies, achieving a **30%** improvement in document retrieval and ranking precision
- Implemented and evaluated retrieval models (**BM25**, various language models), optimizing performance by **45%**, while employing metrics such as **IDCG**, **F1 score, and Zipf's law** to assess model efficacy using **matplotlib**

LendIt | MongoDB, Express.js, React.js, Node.js | **Hackathon Winner**   November 2023

- Developed a platform for college students to borrow and lend items across college campuses
- Customized the platform to cater specifically to college campuses, facilitating a seamless and localized lending and borrowing experience for students
- Implemented secure user authentication mechanisms using Auth0 to safeguard user accounts and personal data
- Awarded **Best Sustainability Hack** and **Wolfram Alpha Letter Award** during the hackathon, recognizing the project's innovative and sustainable approach as well as being in the top **8 teams out of 87**