Nidhi Mathihalli

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Education

Massachusetts Institute of Technology, Cambridge, MA 2023 - 2027
Bachelor of Science in Mathematics & Artificial Intelligence and Decision Making

GPA: 4.9/5.0

Relevant Current Year Coursework: Intro to Algorithms, Design & Analysis of Algorithms, Computation Structures, Software Construction, Computability and Complexity Theory, Intro to Machine Learning

Awards

- USA Junior Math Olympiad Qualifier (top 250 out of 300,000 students)
- National Junior Science and Humanities Symposium Winner (1st out of 12,000 students) + 13.5K scholarship; my project experimented with computer vision on Raspberry Pi Zero and other minicomputers with less than 1 GB RAM

Experience

Martini.ai Internship: AI powered credit risk assessment for private companies *June - Aug 2024*

- Created signals using graph embeddings on bonds data, nearest neighbors, employee count, rank, and company age to predict Zero-Volatility Spreads for determining company default rates
- Increased Spearman coefficient for 3.5M companies from a baseline of 0.476 to 0.589 (23.7%). For 10K companies with bonds data, Spearman increased from 0.573 to 0.633 (10.5%).
- Increased Spearman in z-spread prediction led to a higher accuracy in both default rate prediction and overall company credit rating, especially for startups and companies with limited data
- Created playground to predict and compare stock performance based on a user's formulaic combination of pre-defined models or by upload said user's own custom models

Tools Used: Pytorch Big Graph, GGVec, ProNE, k-Nearest Neighbors, PostSQL

SpaceNVS: AI-based Novel View Synthesis to reconstruct space objects
MIT ARC Lab (Aero-Astro Department) *Nov 2023 - May 2024*

- Accepted to ***2024 IAC International Conference*** (presentation on October 15th, 2024)
- Created 3D point cloud from single-image input source using DreamGaussian 3D reconstruction and a modified Zero123XL. The model was finetuned for spacecraft reconstruction
- Demonstrated significant improvements in re-construction image quality across multiple metrics, including PSNR (+2.53%) and SSIM (+2.38%) from 30 previously unseen spacecraft images

Tools Used: 3D Gaussian Splatting, DreamGaussian, Zero-shot Image-to-3D via Zero123XL

A Money Reader for the Visually Impaired Using Machine Learning

- Presented at the ***WSCG 2022 International Conference*** *2019 - 2023*
- Built a currency detection device using Raspberry Pi and transfer learning. The prediction runs on the device (offline mode) in less than 7 seconds with an accuracy of 94%.

Tools Used: Raspberry Pi, ESP32-CAM Module, Keras, Tensorflow

Cranial Variation in Modernized and Pre-Modernized skulls using AI/ML & Clustering
Stanford University Snyder Lab *2020- 2022*

- Created feature detection model using kNN and k-means clustering to find cranial differences

Tools Used: K-means clustering algorithm, tSNE, UMAP, PCA dimensionality reduction algorithms

Smart Energy Grid with the use of AI/ML to determine Cascading Failure Power Lines

Santa Clara University Engineering Lab *2020- 2021*

- Created an algorithm to find vulnerable nodes through a one-way encoded modified BERT
- Improved simulation efficiency while maintaining similar accuracy to previous power-flow based models

Tools Used: Continuous Bag of Words, Word2Vec, N-gram models, Modified BERT model

Other Information

- Software languages: Python, Java, C, RISC-V, HTML/CSS,
- Newspaper EIC in high school and part of MIT's newspaper
- MIT House Government Exec
- MIT Dance Team Exec
- MIT Assistive Technology team member (working on products for the visually impaired)