Paul J. Mello

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Half Moon Bay, California

Summary: As an Artificial Intelligence graduate student with a deep curiosity for the fundamental truths of nature. I've concentrated my research on the nexus of generative AI, deep learning, and information theory. Drawing from this expertise, I've crafted neural solutions with the aim of solving, optimizing, and re-framing real world problems.

Education

Artificial Intelligence — ***Master of Science*** Aug 2021 - May 2024
Charles W. Davidson College of Engineering
San José State University, California
Related Coursework: Deep Learning, Autonomous Systems, Data Science

Computer Science — ***Bachelor of Science*** | **Mathematics, Philosophy - *Minor*** Aug 2016 – May 2021
College of Engineering & Computer Science
Sacramento State University, California
Related Coursework: Machine Learning, Software Engineering
Honors: Dean's List Recipient

Work Experience

Information Processing in Diffusion Processes — ***Master's Thesis*** May 2022 - May 2024
- Currently researching the information processing capabilities of generative AI in denoising neural networks.
- Leveraged novel techniques to discover fundamental connections between previously independent processes.

Multi-Resolution Diffusion for Privacy-Sensitive Recommender Systems — ***Paper*** May 2023 - Oct 2023
- Co-authored a novel Latent Diffusion architecture to synthesize privacy preserving data for recommender systems.
- Achieved state of the art results in generating realistic privacy preserving user-item interactions without differential privacy measures by minimizing data sparsity and introducing multi-resolution score-based diffusion.

Flower Classification — ***Kaggle Competition*** Jan 2022 - May 2022
- Co-developed a TPU based classification model achieving a 12/162 leaderboard ranking.
- Led a team strategy to utilize weighted ensembling across well-established models, and applied novel data augmentation techniques to achieve a highly accurate classification model.

Population Projection — ***Course Project*** Aug 2021 - Dec 2021
- Utilized machine learning and time series forecasting on World Bank Data to predict global population trends, uncover hidden patterns through statistical analysis, and enhance understanding via data visualization.

Amputee Rehabilitation Software — ***Capstone Project*** Aug 2020 - May 2021
- Directed an 8-person team in close partnership with medical specialists to craft algorithmic approaches to address the needs and challenges of amputees through individualized care.
- Engineered a visualization application allowing medical professionals to manage and interact with patient data across devices.

Competitive Director — ***Sacramento State Club*** Aug 2018 - Dec 2019
- Held Big Sky's committee chair to facilitate intercollegiate competition between dozens of universities.
- Directed over a dozen concurrently competing teams across various sports, tournaments, and divisions.
- Increased club enrollment by 2,000% through implementing a scalable club framework.

Technical Projects

Image Annotation Generator — ***Course Project*** Aug 2022 - Dec 2022
- Developed and optimized an image captioning machine learning method which enhanced caption accuracy using term frequency balancing through manual and SMOTE methods.

Stock Market Chatbot — ***Personal Project*** Oct 2021 - Dec 2021
- Created a machine learning chatbot to retrieve and relay real time NYSE data through Alpha Vantage API calls.

Skills

Programming Languages and Libraries

- Libraries: PyTorch, TensorFlow, Keras, tinygrad
- Languages: Python, R, C, C++, SQL, Java