Cameron Fabbri

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SUMMARY

Senior Machine Learning Engineer with 8 years of experience across diverse domains, adept at rapidly solving complex problems through innovative, cutting-edge solutions.

SKILLS

Technical Skills: Python, Pytorch, Transformers, Open Source LLMs, sentence-transformers, Vector Databases, OpenAI API, scikit-learn, NumPy, Pandas, SQL, Git, Agile, AWS
Machine Learning: Deep Learning, Large Language Models (LLMs), Natural Language Processing (NLP), Retrieval Augmented Generation, Ranking Algorithms, Computer Vision, Convolutional Neural Networks (CNNs), Graph Neural Networks (GNNs)
Soft Skills: Problem Solving, Critical Thinking, Attention to Detail, Communication, Leadership, Teamwork

EXPERIENCE

Good Karma LLC **09/2024 - Present**
Senior Machine Learning Engineer Remote

- Developing an online educational counseling platform powered by LLMs, integrating multi-agent interactions, RAG, and database management to deliver personalized guidance for students.
- Designed and implemented a large-scale document retrieval pipeline leveraging Qdrant for database management to efficiently parse and chunk HTML and PDF files from 64 SUNY schools. Integrated metadata-based search capabilities to optimize retrieval, ensuring contextually relevant responses by focusing on specific schools when mentioned.

Prolego, Inc. **03/2022 - 05/2024**
Senior Machine Learning Engineer Remote

- Built a custom Retrieval Augmented Generation (RAG) system with a reranking algorithm to automate the alignment of internal policy documents with external regulatory standards for compliance processes.
- Fine-tuned the Document Image Transformer (DiT) for table extraction from complex financial documents.
- Developed a system to generate synthetic financial data for training table detection models ensuring data privacy while improving model robustness.

3M **09/2018 - 03/2022**
Data Scientist Specialist Maplewood, MN

- Scrum Master: Initiated and led a team focused on applications of generative models, driving innovation across projects.
- Designed machine learning-driven computer vision tools to generate SEM-like images from Confocal Microscope data using GANs, enhancing image quality and structural detail.
- Conducted predictive and generative experiments on point clouds and 3D meshes of abrasive grains for identifying patterns in breakage behavior under stress and wear.
- Implemented custom graph operations in PyTorch for the above project including various types of convolutions, pooling, and upsampling.
- Developed advanced generative models for automated metamaterial design, streamlining the optimization of physical simulations to enhance design efficiency.

Air Force Research Laboratory **07/2015 - 08/2018**
Computer Scientist Rome, NY

- Developed a custom CNN pipeline to extract and analyze radio frequency signal strength from Google Maps satellite imagery using GIS data conversions.
- Implemented an active learning technique to quickly train a multiclass classifier using a Support Vector Machine and features from Alexnet

EDUCATION

M.S Computer Science **2018**
University of Minnesota Minneapolis, MN

Thesis: Underwater Image Enhancement using Generative Adversarial Networks

B.S Computer Science **2015**
Clarkson University Potsdam, NY

Thesis: Human-Robot Interaction Through Natural Dialogue

PATENTS

Neural network-based generation and placement of tooth restoration dental appliances
Patent Number US11960795B2, Granted April 16 2024

Automated processing of dental scans using geometric deep learning
Patent Number US-20240008955-A1, Published January 11 2024 (pending)

Deep Learning for Automated Smile Design
International Publication Number WO2023017390A1, Published February 16 2023 (pending)

Systems, media, and methods for metasurface development
International Publication Number WO2024127190A1, Published June 06 2024 (pending)

PUBLICATIONS

Enhancing Underwater Imagery using Generative Adversarial Networks
International Conference on Robotics and Automation (ICRA), 2018

PROJECTS

AstroGAN **2018**
Generated images of galaxies from GalaxyZoo with controlled morphologies using conditional WGAN

Adversarial Immitation Learning **2018**
Developed a GAN based approach towards controlling a self driving car simulated in GTAV.

Generative Adversarial Networks Implementations **2017**
GAN/DCGAN, LSGAN, EBGAN, WGAN-GP, Pix2Pix, CycleGAN

Colorful Image Colorization **2016**
Implemented a image colorization algorithm using regression-based CNNs with TensorFlow pre-release for grayscale-to-color transformations.