JACOB P. RIVIERE

Email: jriviere@alumni.cmu.edu | Phone: (412)715-9061 | LinkedIn: jacob-riviere

EDUCATION

Carnegie Mellon University Pittsburgh, PA
Bachelor of Science in Statistics & Machine Learning | GPA: 3.6/4.00 August 2019 – May 2023

TECHNICAL SKILLS

- Coding Languages: Python, C, C#, C++, JavaScript, Typescript, React, R, SQL, MATLAB, HTML, CSS
- Python Libraries: PyTorch, TensorFlow, Huggingface, Numpy, Pandas, Scikit-learn, Matplotlib, OpenCV
- R Packages: tidyverse, dplyr | Other: AWS, GCP, Kubeflow, Docker, Azure, TensorRT, Git, Unix/Linux, Agile

WORK EXPERIENCE

Lockheed Martin King of Prussia, PA
Machine Learning Engineer II October 2024 – Present

- Researching the use of diffusion models and Flow-based generative models to detect and mitigate anomalous data
- Received 80 hours of funding for a project to do change detection on remote sensing Sentinel-2 data, where I implemented a model consisting of a diffusion-based feature extractor and lightweight hierarchical classifier reaching an f1 of 0.647

Machine Learning Engineer I October 2023 – October 2024

- Implemented a diffusion model using PyTorch and Huggingface, to close the synthetic data gap in imagery through domain adaptation which resulted in 55% zero-shot class accuracy in a downstream classification task and led to multiple contracts where customers were shown my results to secure millions in funding
- Integrated an implementation of a SOTA transformer-based object detection model into the team's baseline in Python with the aim of speeding up inference time. Redesigned the codebase to employ a better backbone and data pipeline and used Docker to deploy the model in a Kubernetes environment which resulted in a decrease in latency by 52% while retaining recall and mAP thresholds
- Developed a text-guided diffusion model using PyTorch to generate synthetic images for use in model training
- Created a robust domain adaptation test pipeline using a transformer-based classification model and analysis of the model activations in the high dimensional space, as well as model performance on imagery from the target domain
- Led an intern through their summer intern project which involved consistent problem solving for their blockers as well as pair programming and providing guidance and direction for their weekly milestones
- Incorporated TensorRT into the team's model deployment to further drive down latency
- Aggregated large-scale image datasets in AWS and created image caption pairs to train text-guided diffusion models and boost generated image fidelity greatly through diffusion model pre-training and subsequent fine-tuning

Twitter New York City, NY
Machine Learning Engineer Intern May 2022 – August 2022

- Built and tuned a multi-label classification model using TensorFlow to predict labels for ingestion into targeted ad models, with the goal of increasing the label coverage for ad tweets.
- Used Google BQ with complex SQL queries to form a dataset of millions of ad tweets and their existing labels
- Performed feature engineering to encode the text of the tweets and formed features using impression graphs
- Implemented a model from a deep learning research paper in TensorFlow and tuned hyperparamters in Kubeflow
- Increased coverage of ad tweet labels by 35% with high precision predictions
- Constructed and presented an experiment proposal for the model's labels to be used in an online experiment.

PROJECTS:

Personalized LLM: Used SQL queries to aggregate personal imessage data and create a dataset of prompts and responses. Performed data processing and cleaning steps to catch edge cases and finetuned an LLM using Meta's Llama2 weights.
Shoe Classification: Scraped Google and Instagram to compile a dataset of shoe images using search terms and captions as pseudo-labels. Trained models to perform classification on the images and benchmarked model performance across a variety of experiments using TensorFlow and Huggingface.