PIERO ESPOSITO

pi@piesposi.to — Member of Technical Staff @ Runway

EXPERIENCE

Runway New York, NY
Member of Technical Staff, Research 2023 - Present

- Planned, designed and led the implementation of the internal model training framework.
- Worked on scaling multimodal diffusion models, such as Gen-3 and Frames
- Worked on optimizing large scale distributed Deep Learning training systems for MFU, memory usage and fault tolerance.
- Implemented, optimized and maintained inference pipeline of diffusion models that run millions of predictions per day.
- Led research project on Debiasing Text-to-image Diffusion models, presented at Neurips 2023 Algorithmic Fairness through the Lens of Time workshop

Sticker Mule Amsterdam, NY
Senior Machine Learning Engineer, Tech Lead 2021 - 2023

- Led implementation of background removal tool (Trace)
- Reduced in 66% serving cost of image-upscaling tool (Upscale)
- Migrated model training and serving from Tensorflow to PyTorch

Previous experiences Remote
Internship, Software Engineer, Freelancer, OSS contributor 2018 - 2023

- Co-authored Intel Labs' Bayesian Torch lib
- Introduced sequential cpu offloading on Diffusers, reducing Stable Diffusion memory footprint in 90%
- Introduced 2x faster checkpoint loading on Diffusers
- Created open, highly liked Stable Diffusion 1.5 fine-tune
- Taught Brazilian Government Officials on a coding bootcamp

EDUCATION

University of São Paulo, São Paulo, Brazil Enrolled: 01-2019 — Dropout
BSc in Applied Mathematics

RESEARCH, PROJECTS

Gen-3 and Frames
`https://runwayml.com/research` 2024-2025

- Gen-3 Alpha is the first of the next generation of foundation models trained by Runway on a new infrastructure built for large-scale multimodal training.
- It is a major improvement in fidelity, consistency, and motion over Gen-2, and a step towards building General World Models.
- Frames is our newest base model for image generation, marking a big step forward in stylistic control and visual fidelity.
- It excels at maintaining stylistic consistency while allowing for broad creative exploration.

Mitigating stereotypical biases in text to image generative systems ACT Workshop @ Neurips 2023
`https://arxiv.org/abs/2310.06904` 10-2023

- Reduced stereotypical biases on Stable Diffusion models by training on synthetically, debiased data across biased feature
- Diversity finetuned (DFT) model improves the group fairness metric by 150% for perceived skin tone and 97.7

Vintedois Diffusion
`https://huggingface.co/22h/vintedois-diffusion-v0-1` 01-2023

- Fine-tuned Stable Diffusion 1.5 on curated high-quality data
- Introduced new token associated with high-quality data
- On early 2023, was the second trendiest model on HF Hub, after only Runway's Stable Diffusion 1.5
- Was downloaded more than 300,000 times, and is still downloaded ¿ 10,000 times monthly since open-sourced.

Bayesian Torch
`https://github.com/IntelLabs/bayesian-torch` 2020

- It is Intel Labs' library for Bayesian neural network layers and uncertainty estimation in Deep Learning

Blitz - Bayesian Layers in Torch Zoo
`https://github.com/piEsposito/blitz-bayesian-deep-learning` 2020

- It is a simple and extensible library to create Bayesian Neural Network layers on top of PyTorch
- It is one of the largest Bayesian Deep Learning frameworks on top of PyTorch with 800 Github stars.