Niall Dalton

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Website: ndalton12.github.io/ · GitHub: github.com/ndalton12

Education

Northeastern University · August 2021 · *B.S. in Computer Science and Physics; Math Minor* **GPA:** 3.7 / 4.0

Coursework: Machine Learning Research Seminar, Vector Calculus, Computational Physics, Differential Equations, Algorithms, Quantum Mechanics, Object-Oriented Design, Statistics, Linear Algebra, etc.

Technical Skills

Languages: Python, Rust, C/C++, Bash, Java, MATLAB
Frameworks: PyTorch, NumPy, Pandas, TensorFlow, FreeRTOS, ARM, Sci-Py, CUDA, Django
Utilities: AWS (S3, Lambda, EC2, DynamoDB, etc.), Docker, Vim, Git, Linux, GCP
General: Optimization, Machine learning (ML), Deep learning (DL), Computer vision (CV), Reinforcement learning, Distributed processing, Hypothesis testing, TTD, Simulation, Scrum, Pair Programming, CICD, GPU programming

Experience

Amazon: Satellite Software Engineer I and II **Sep 2021 – Present**

- Wrote mission critical embedded software for bespoke satellite power management including battery algorithms, temperature/voltage/current protections, and peripheral drivers for hardware components
- Wrote host side software for taking pictures on satellite onboard cameras
- My software components were critical to the success of Amazon's first real space mission (Protoflight) in which two satellites were deployed to space and operated successfully for the first time in Oct. 2023

Activ Surgical: Machine Learning Intern **January 2021 – May 2021**

- Developed CNN model for detecting the critical safety view in laparoscopies with high accuracy and recall
- Managed experiment infrastructure and visualization using MLOPS and evaluated edge hardware (NVIDIA Jetson Xavier) for feasibility in real-time healthcare AI
- Animated integrated gradients interpretability on laparoscopic CNN model for medical understanding

Northeastern Counter-UAS Lab: Research Assistant **January 2020 – June 2020**

- Trained ResNeXt CNN for detection of drones using PyTorch
- Authored scripts for automated image collection of simulated drones in Microsoft AirSim

MIT Lincoln Laboratory: Deep Learning Research Intern **May 2019 – November 2019**

- Implemented Transformer based model in PyTorch for genomic pre-training + DNA classification
- Incorporated and evaluated various variational autoencoders (VAE) in an anomaly detection pipeline
- Architected a multi-thread, real-time decision validator for war games using Python and RabbitMQ

Projects & Publications

AMPED: Advantaged Markov Proxy Evolution Dynamics PyTorch/Ray/GCP

- Designed a novel deep RL algorithm that generalizes *MuZero* to n-th order Markov chains and combines the *PPO* objective with the *MuZero* objective for better generalization
- Used distributed training on GPUs via GCP to reach comparable to state-of-the-art performance

Scientific Truths Are Not Self Evident: Science, Perception, and Identity in America Python

- Analyzed cultural perceptions of science with NLP techniques and big (Twitter) data
- Determined that science is often perceived as a narrative rather than a set of truisms

Shifting Morals: A Study in Probabilistic Machine Ethics JS/Django

- Launched a website using Heroku that crowd sources non-deterministic AI ethics by presenting probabilistic moral quandaries that involve machines or AI

Patent WO2021252384A1 Systems and methods for processing medical data

Minor Open-Source Contributions: PyTorch, TensorFlow, Django, AirSim, Flutter, etc.