Chris Nalty

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Education

University of Maryland   Spring 2018 - August 2021
Bachelor's in Computer Science with honors, with Mathematics minor   GPA 3.87

Salisbury University   Spring 2017 - Fall 2017
Bachelor's in Physics - Transferred before completion   GPA: 4.0

University of Maryland Eastern Shore   Fall 2015 - Fall 2016
Bachelor's in Professional Golf Management - Transferred before completion   GPA: 4.0

Employment

Mukh Technologies - Machine Learning Engineer   September 2019 - Present
- Research on thermal to visual face verification using Generative Adversarial Networks
- Facial recognition API maintenance and development in C++
- Creation of an automated test suite for facial recognition pipeline

Mukh Technologies - Software Engineering Intern   May 2019 - August 2021
- Data and algorithm visualization for facial recognition software
- Containerization of neural network pipeline in Docker
- PyTorch training and dataset scripts

Orbit Logic - Systems Engineering Intern   Nov 2018 - May 2019
- Regression testing
- Automation of test setup and running including database restoration using python

Honors Thesis - A Comparison of Policy Gradient Methods for Multi-Task Learning

This paper compares two policy gradient methods for multitask learning (MTL) on the Atari visual environments. These environments are complex and take millions of time steps to learn. This paper investigates Advantage Actor-Critic (A2C) and Proximal Policy Optimization's (PPO) performance on one, two and four tasks from the Arcade Learning Environment. The results show that agents trained with both PPO and A2C have improved performance when trained on multiple tasks when compared to a single task. PPO showed the most consistent improvement and scored the best overall. However, A2C's improves the most on average compared to its baseline. Additionally, the stability of reward during training shows that the trust-region approximation of PPO may not be as beneficial in MTL as in a single task, and may even be a hindrance.

Projects

Multi-Task DDQN on Atari | Spring 2020 | with Jill Granados, Michael Stephanus, Makai Freeman
- Implementation of Double Deep Q Network algorithm with PyTorch
- Training comparisons of four visual atari environments

Genetic Algorithms for PyTorch | Fall 2019
- Training of fully connected networks using Genetic Algorithms on custom environments
- Uses chromosome representation algorithm with weight level crossover and mutation

Character Recognition | Fall 2019
- Handwritten digit classification on MNIST and Kannada MNIST datasets using a convolutional neural network in Pytorch

Gait Estimation | Summer 2018
- Estimate gait frequency and amplitude
- Extracts keypoints from a pose estimation network using basin-hopping to estimate gait
- Produced stabilized videos of people walking.

Relevant Coursework

Computer Science: Algorithms, Organization of Programming Languages, Machine Learning, Computer Vision, Intro to Data Science, Advanced Data Structures, Parallel Computing, Computational Methods

Math: Calculus 1-3, Linear Algebra, Differential Equations, Statistics, Number Theory, Abstract Algebra, Complex Calculus

Skills

PyTorch, Computer Vision, Reinforcement Learning, OpenAI gym, Git, Docker, OpenCV, Unix, LaTeX, data scraping

Languages

Python, C++, C, Java, Coq, OCaml, Ruby, MATLAB