Andrew Farabow

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Education

Virginia Tech (2019 - present, graduating in 2023)
Major GPA: 3.3   B.S. in Computer Science w/ Stat Minor
Elective Courses: Data-Centric Computing Capstone,
Data Analytics and ML 1&2, Regression Analysis,
Mathematical Statistics 1&2, Restricted Research
Gonzaga College High School (2015 - 2019)

Skills

Programming: Python, C, Java, R
Frameworks: PyTorch, Tensorflow/Keras, Scikit-learn,
Pandas, Numpy, Matplotlib, RLLib, OpenAI Gym
Other: deep learning, recurrent and convolutional neural
networks, reinforcement learning, GANs, autoencoders,
data analytics, Linux, Git, Docker, Kubernetes

Work Experience

Machine Learning Engineer Intern - Vake   **Summer 2022**
- Using machine learning to automatically detect dark ships in satellite images.

Research Assistant - Sanghani Center (Virginia Tech)   **May. 2021 - present**
- Spearheading the effort to create an open-source library of epidemiological models, datasets, and other tools for forecasting the COVID-19 pandemic and the seasonal flu, under the direction of Prof. Naren Ramakrishnan and funded by a NSF REU Supplement.
- Created a user-friendly, scikit-learn inspired interface and structured the library to maximize code reuse, simplifying the creation and use of new models and datasets.
- Implemented compartmental, statistical, and machine learning models, as well as datasets and evaluation metrics.
- Developed a RNN model using the library to contribute influenza case forecasts to the CDC FluSight Competition.

Research Assistant - BIST (Virginia Tech)   **Nov. 2019 - present (school year)**
- Working on a Center for Bioinspired Science and Technology project, led by Prof. Rolf Mueller, involving the use of bat-inspired biomimetic sonar and deep learning for robotic navigation in forested environments.
- Helped develop a ConvNet-based algorithm to predict the position of the sonar sensor within a forest area.
- Currently preparing a manuscript for submission in Summer 2022.

Research Assistant - Hume Center (Virginia Tech)   **Sept. 2019 - Dec. 2021 (school year)**
- Built a grid-based, OpenAI Gym-compatible simulation called SensorGrid that replicates key aspects of drone sensing and navigation challenges in a simplified environment, useful for testing reinforcement learning models before deployment to a more computationally-expensive environment, as part of the Raytheon RAAIDS project.
- Currently preparing a first-author manuscript for submission in Summer 2022.
- Designed and trained a Resnet-based object-detecting convolutional neural network architecture, which achieved 97% accuracy on the classification phase of the Lockheed Martin AlphaPilot Dataset.

Machine Learning Engineer Intern - Decipher Technology Studios   **2018 - 2020 (summers)**
- Improved performance of a recurrent autoencoder used to identify anomalies in service logs by adding self-attention.
- Worked on a small team to develop a predictive autoscaler that uses deep reinforcement learning (RL) to control the resources allocated to a microservice, striking a balance between performance and hosting cost.
- Wrote PyTorch implementations of policy gradient, Q-Learning, and actor-critic deep RL algorithms.
- Wrote a simulator for offline training and a microservice for online training and deployment (on Openshift and EKS).
- Added recurrent and convolutional layers to the neural networks to better leverage autocorrelation within the data.

Awards

David Heilman Research Award   **April 2022**
- Awarded by the VT CS department for excellence in undergraduate research.

Best Overall at HackBI   **January 2017**
- Wrote an app that makes use of machine learning and computer vision techniques to interpret hand-written text.

Activities

Head of Logistics - VTHacks Organizing Team   **2019 - present**
- Overseeing the team responsible for managing the budget, purchasing meals, recruiting faculty judges, and other tasks.

Stage Manager - Gonzaga Dramatic Association Stage Crew   **2017 - 2019**
- Led a team of over 20 students in the construction of a structure over 20 ft. wide and 8 ft. tall.
- Coded and designed circuits for custom Arduino and Raspberry Pi-based lighting effects and optical illusions.

Projects

Movie Neural Style Transfer - For the capstone project component of my degree, my team created a dataset of frames from Star Wars movies and trained a CycleGAN to modernize the visuals.

Computable AI - Co-author of a blog on machine learning, writing a Fundamentals of Deep RL series.

Machine Learning Templates - Flexible PyTorch implementations of a supervised learning neural network, autoencoder, GAN, and evolutionary algorithm designed for future machine learning projects.