Danny Mathieson

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Summary

Graduate student studying data analytics and machine learning. Passionate about data mining, deep learning, modeling processes, designing algorithms, and constructing predictive models to solve vexing problems.

Education

Masters of Engineering, Computer Science (Machine Learning and Analytics), Virginia Tech Expected May 2023

- In progress GPA 4.0/4.0
- Coursework: Data Structures and Algorithms, Machine Learning with Big Data, Urban Computing, Data Analytics, Ethics and Professionalism
- **Languages:** *Proficient*: Python, Java, Bash *Familiar:* C++, SQL, MatLab

Masters of Education, Integrative STEM Education, Virginia Tech December 2016

Bachelors of Science, Sociology, Virginia Tech May 2012

Professional Experience

Machine Learning Engineer Intern, Applied Research in Acoustics LLC June 2022- August 2022

- Utilized deep learning algorithms to analyze acoustic data, time series features, and construct a novel few shot object detector and classifier that outperformed off the shelf models
- Supported computer vision research, algorithm development, software design, and testing across the machine learning operations lifecycle

Principal Internet of Things Consultant, Arm North America September 2020- Present

- Served as subject matter expert on K-12 Physical Computing, IoT, and Data Science Education
- Co-created EdX course on the applications of microcontrollers to introduce students to machine learning

Technology Education Instructor, Christiansburg Middle School August 2017- July 2021

- Served as Department Chair for Engineering and Technology Education
- Partnered with Virginia Tech to enhance curriculum in robotics, cybersecurity, IoT, and artificial intelligence

Founder, Arduino Teacher: K-12 IoT Education July 2015- Present

- Developed K-12 curriculum for Internet of Things Education
- Designed and provided professional development in physical computing and data analytics

Science Teacher, Teach For America August 2012- July 2015

- Taught 8th Grade Earth Science at Kirtland Middle School on the Navajo Nation
- Lead outreach and programming as American Indian Science and Engineering Society chair

Projects

Semantic Segmentation for Synthetic Aperture Radar

- Engineered data pipelines via dynamic API query to construct a dataset with 1 million labeled SAR images
- Implemented transformer architectures utilizing **PyTorch** and **HuggingFace** for feature extraction and transfer learning from natural images to dual-polarization Sentinel-1 SAR images
- Developed **weakly-supervised** algorithms to improve SAR landcover pixel-wise **semantic segmentation** with integrated **active learning** user interface

Predictive Analytics for Cycling Fatalities

- Combined disparate data from various public repositories in a novel approach to urban analytics and social engineering using **mySQL**, **Pandas,** and **NetworkX**.
- Conducted exploratory data analysis with **Numpy**, **Matplotlib**, **Seaborn**, **and SciPy** and presented a visual summary to stakeholders using **Dash** and **Jupyter Dashboards.**
- Experimented with supervised classifiers including **logistic regression**, **support vector machines, Naive Bayes**, and **K-Nearest Neighbors** to predict the severity of cycling crashes at over 93% accuracy.

Arduino Signal Processing and Machine Learning

- Designed IoT system using the **Arduino** platform to collect, process, and send accelerometer data to the cloud for use in a smart baseball bat system
- Implemented **Random Forest Classifier** using **TensorFlow** to classify and predict swings, hits, and misses from accelerometer data