Alec **Hodgkinson**

Senior Machine Learning Engineer

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Summary

A Senior machine learning engineer with experience in both research and software engineering. I am able to take models from an idea through the development stage, all the way to deployment on the edge.

Education

Rensselaer Polytechnic University *Aug 2013 - Dec 2016*

B.S. in Applied Mathematics, Minor in Computer Science

Experience

Dawnlight *Aug 2021 - Present*

Senior Machine Learning Engineer, Project Lead

- Designed and implemented a prototype automated pipeline for data annotation and data pre-processing capable of handling 50 Tb per week.
- Led and coached junior engineers in writing maintainable code that minimized technical debt.
- Designed and implemented scalable ML Ops infrastructure to support a team of data scientists.
- Orchestrated, vetted, and managed multiple 3rd party vendors for data annotation.

Machine Learning Engineer *Aug 2020 - Jul 2021*

- Developed a flask and C++ based data collection tool for capturing synchronized data from multiple RealSense cameras.
- Designed and built an in-house machine learning platform on top of Kubeflow and Kubernetes, with plugins for DVC, Tensorboard, and Ray.
- Created prototype visualization tools to for researchers to use in their model development.
- Conducted 30+ interviews for a variety of roles including Research Scientist, ML Engineer, Frontend Developer, etc.

Panasonic Beta *Mar 2018 - Jul 2020*

Home Action Genome, Project Lead

- Managed activities in a team of seven, including engineering, process development, and data recording, and proposal writing.
- Prototyped a sensor suite and wrote custom firmware to communicate between the Pi and sensors over I2C.
- Wrote software to cleanly record and package video and sensor data into a video container for easy distribution.
- Developed a Flask-based front-end for recording synchronized data across multiple sensor suites, speeding up recording time by 50x.
- Created a baseline activity recognition model using PyTorch.

DoorGym: A Scalable Door Opening Environment And Baseline Agent, Project Lead

- Developed initial proof of concept for door opening simulation.
- Developed a novel CNN-based vision pipeline in PyTorch for regressing 3D door knob location from multiple views. Achieved an accuracy of ±1.7 cm in simulation, accurate enough for an agent to open a door.
- Transferred vision neural network trained in simulation to real doorknobs with an accuracy of ±4.95cm.
- Performed ablation tests to verify the necessity of each component in the vision network pipeline.
- Created infrastructure for controlling Baxter Robots with neural networks.

Panasonic Silicon Valley Labs *Mar 2017 - Mar 2018*

Deep Learning Engineer

- Designed a post-processing filter in PyTorch as a replacement for the SAO deblocking filter in H265, resulting in a 20% bitrate reduction.
- Implemented end-to-end deep learning models for image compression using Tensorflow and PyTorch.
- Filed three image compression related patents that are undergoing filing.
- Evaluated and adapted state of the art deep learning models for alleviating catastrophic forgetting in neural networks.
- Developed face tracking/identification software for a robotic platform running in real time at 30 FPS.
- Developed proof of concept demonstration using deep learning based monocular image height estimation running on a Raspberry Pi for presentation to CEO.
- Created a raindrop removal and object detection demo to be run embedded devices, such as a Jetson Nano.
- Implemented production ready multi-label classification models using ONNX and TensorRT, and various model compression schemes such as techer student distillation and weight pruning.
- Developed a gesture detection model and API for use in a smart home setting.

Technologies

Programming	Python, JavaScript, C++, LaTeX
Machine Learning	PyTorch, TensorRT, ONNX, NumPy, OpenCV, Scikit-Learn
Web	Flask, HTML5, CSS3, React, P5.js
Other Technologies	Git, Docker, Bazel, Kubernetes, Kubeflow, AWS, GCP, ZeroMQ, Apache Airflow, Apache Spark