Stephen Jarrell

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PERSONAL SUMMARY

I am a driven life-long learner of machine learning. I have recent experience developing and deploying models for early wildfire detection in California, and computer vision enabled maritime security for the US Navy and US Coast Guard in a startup environment. I enjoy prototyping and reading research papers to stay informed on the state-of-the-art. I am a new Graduate student in Computer Science and Engineering within Jacob's School of Engineering at UC San Diego.

EDUCATION

University of California, San Diego (UCSD) **Sept. 2017 – June 2021**
BS in Cognitive Science specializing in Machine Learning & Neural Computation *San Diego, CA*

University of California, San Diego (UCSD) **Sept. 2021 – June 2023**
MS in Computer Science and Engineering specializing in Artificial Intelligence *San Diego, CA*

WORK EXPERIENCE

Saildrone Inc. **June 2021 – Aug. 2021**
Machine Learning Engineer Intern *Alameda, CA*

- Developed and deployed deep neural networks for perception on the Saildrone Fleet of 100+ autonomous ocean drones. This technology is used for maritime security & surveillance by the USCG and US Navy, developed with Python, PyTorch, C++ and Linux
- Achieved 3.5x accelerated detection inference on drones over the previous model, by quantizing and employing structured pruning of 350 billion excess computations in blocks of the ResNet backbones to optimize for embedded devices
- Expanded the data augmentation pipeline to include "bag of tricks" from YOLOv4 and YOLOv5 to improve our RetinaNet
- Performed daily experimentation and hyperparameter optimization using distributed resources, Docker and AWS Sagemaker

San Diego Supercomputer Center **Nov. 2020 – June 2021**
Machine Learning Software Engineer Intern *San Diego, CA*

- Developed deep Learning models on a supercomputer cluster for object detection and segmentation, such as Faster R-CNN and Mask R-CNN, using PyTorch and Python.
- Engineered these neural network architectures for Wildfire Smoke Detection at high-altitude weather stations across California
- Automated image preprocessing for training and performance evaluation of the model, frame-by-frame, for hundreds of videos
- Coordinated amongst a global team of Deep Learning Researchers to program state of the art methods for proprietary image data

Computational Neural Data & Dynamics Lab **Dec. 2019 – Mar. 2020**
Undergraduate Researcher *San Diego, CA*

- Facilitated Neuroscience Researchers, as part of President Obama's BRAIN Initiative, in creating the first taxonomy of every cell in the mammalian brain, by deploying Unsupervised Machine Learning methods to a web portal using Python
- Built pipelines in a Linux environment to efficiently process RNA-seq, methylation and chromatin acc data for neural cell clustering

Axos Bank **June 2019 – Sept. 2019**
Data Analyst Intern *San Diego, CA*

- Improved customers' time on call by 32% and abandonment rate by 26% by programming Python scripts for root cause analysis
- Created custom SQL queries to feed Home Mortgage lending data into multivariate regression and hypothesis testing

SKILLS

- **Programming Languages:** Mastery of Python, C, C++, Java
- **Software Tools and Systems:** SQL, MySQL, Git/GitHub/Gitlab, Linux, Docker, AWS Sagemaker, CircleCI, Kubernetes
- **Mathematics of Machine Learning:** Vector Calculus, Linear Algebra, Probability, Statistics
- **Machine Learning Domains:** Supervised Learning, Unsupervised Learning, Deep Learning, Reinforcement Learning
- **Relevant Python Libraries/Frameworks**: TensorFlow, PyTorch, NumPy, Pandas, Scikit-learn

INDIVIDUAL PROJECTS (Website for examples and more @ http://stephenjarrell19.github.io/)

- Deep Reinforcement Learning with TensorFlow and DDPG to optimize a continuous control policy for a Bipedal Walker (OpenAI)
- Deep Dream with TensorFlow to visualize the "black-box" of SOTA image recognition models (ResNet101, VGG16, InceptionV3)
- Classic Car Hardware Restoration by programming Arduino Microcontrollers in C using custom debugging shields