James **McDougall**

Computer Engineer – Networks, Systems, Machine Learning

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Education

B.S. in Computer Engineering, University of California, San Diego. Expected June 2021 (GPA: ~3.5/4.0)

Experience

Software Engineering Intern at Centauri Corp using Python, PyTorch

June – September 2020

- Developed a PyTorch machine learning pipeline for object detection using YOLOv3, Faster-RCNN to train on the DOTA dataset
- Researched novel algorithms for object detection in satellite imagery by utilizing examples from PyTorch documentation and research papers
- Created a Python tool that overlays small images onto larger ones by randomly selecting coordinates and directly manipulating the image matrix
- Created a Python tool that removes overlapping polygons depending on a threshold value
- Designed a Bash tool that downloads many files from google drive and unzips them
- Developed documentation and research notes in Confluence and GitLab

Software Engineering Intern at San Diego Supercomputer Center using Bash, Jupyter, Slurm

September 2019-Present

- Maintain a script which allows users to submit secure jupyter notebook jobs to the supercomputer
- Develop documentation for service using 'readthedocs' and public GitHub repositories

Software Engineering Intern at Cirrascale Cloud Services using Docker, Kubernetes, Tensorflow

June-August 2019

- Designed an ETL diagram using Apache Nifi for transferring data from S3 buckets to local storage
- Created a Docker container to start a Jupyter Notebook to allow users to efficiently test inferencing accuracy of different Tensorflow models on an image directory
- Wrote a script which took as input a Tensorflow model directory and used that model to detect humans in a driving simulation to control the direction of a car
- Created a cluster management tool for reporting server power and temperature using Redfish API and Python, ported to a dashboard API to display graphs of server usage; delivered to client

Computer Science Tutor at UCSD CSE Department

January 2019-June 2019

- Used C++11 debugging skills to assist student in the lab; explained data structures and algorithms

Projects

ClubHouse using **JavaScript, Flask, Docker, Heroku, Postgres**

- Using a Flask server hosted on Heroku, implemented an API in Python for adding events to Postgres database, verifying user status, and getting images
- Templated web components in HTML for login page, new user, dashboard, and club pages
- Using Fetch API and JQuery, implemented page logic using GET and POST requests

Security Camera using **Flask, Nginx**

- Using a Flask server on a Raspberry Pi and an Nginx to proxy through my router, created a video stream and exposed it through my personal domain so I can view my front door from anywhere

Ultrasonic Sensing Robot using **Python, Raspberry Pi**

- Using Python and a Raspberry Pi, manipulated motors to change direction based on ultrasonic sensor data

Skills

Tech Stack: Python, C/C++, Java, JavaScript, React, Docker, Kubernetes, Flask, Bash, Git
Clubs: Late Night Hacks, AlchemyX Startups
Awards/Other: Eagle Scout, Resident Assistant