Amaar Quadri

4A WATERLOO MECHANICAL ENGINEERING

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Languages: Python | Java | C++ | SQL **Frameworks:** Linux | ROS | Keras | React | Django | OpenCV | AWS | scipy

Work Experience

DATA SCIENTIST – WONOLO **JAN – APR 2020**

- Developed machine learning models and infrastructure for ranking candidates for short term job positions
- Engineered features, tuned a gradient boosting random forest model, and refined the objective function
- Balanced exploration with exploitation using the upper confidence bound bandit algorithm

MECHANICAL DESIGN ENGINEER – SUNNYBROOK RESEARCH INSTITUTE **SEPT 2019 – APR 2021**

- Prototyped a catheter with a steerable tip for use in a wide variety of cardiovascular intervention surgeries
- Performed Python simulations to design an ergonomic fully mechanical mechanism for tensioning and actuation
- Authored a **patent** and an **academic paper** on the mechanism's usage as a cable driven parallel mechanism
- Continued to work part time during school terms to create a **sub-millimeter precision** tracking system

MECHANICAL RESEARCHER – METER **MAY – AUG 2020**

- Worked on unsolved research problems relating to the design of an x-ray CT scanner for dimensional metrology
- Dramatically increased x-ray simulation throughput by writing an automation API using AutoHotkey and Python
- Designed and programmed a pipeline for uploading and processing simulation results using **AWS**
- Designed a mechanized x-ray filter changing assembly and wrote a Python software controller for it
- Identified the impact of rotational inaccuracies of the part by analyzing x-ray simulation results

SOFTWARE ENGINEERING CONSULTANT – CAPCO **MAY – AUG 2018**

- Programmed a Java application for parsing logs at a high throughput from a Bank of Montreal database
- Collaborated with coworkers and production support staff to implement the most useful features into the design

Projects

SOFTWARE DESIGN LEAD – WATERLOO AQUADRONE DESIGN TEAM **MAR 2019 – PRESENT**

- Led a student team to design, build, and test an **autonomous submarine** for the 2021 RoboSub Competition
- Implemented an extended Kalman filter to perform sensor fusion and simultaneous localization and mapping
- Designed and programmed a modular hierarchical state machine for implementing competition specific tasks
- Designed and tuned a control system using quaternions to maintain the desired position and orientation
- Collaborated with other sub-teams to incorporate dependable mechanical, electrical, and vision systems
- Justified the value of the team and presented to the university to secure over $30,000 in funding

CONNECT 4 MACHINE LEARNING **MAY 2020 – PRESENT**

- Trained a neural network to play Connect 4 at a superhuman level using self-play **reinforcement learning**
- Implemented **Monte Carlo tree search** using both randomized rollouts and neural networks for evaluation
- Developed a novel scheduling algorithm to balance CPU and GPU utilization leading to over **100x faster training**
- Implemented various other games including Chess, Checkers, Othello, and the Game of the Amazons
- Deployed it to my personal website hosted on a Linux cloud server which I made using Django and React
- If you can't beat it, you owe me an interview :) amaarquadri.com/connect4

Education and Achievements

- Ranked one of the top students, with a **3.9 GPA**, in mechanical engineering at the University of Waterloo
- Completed the Udacity Robotics Software Engineer Nanodegree showing knowledge in controls and automation