Marco Jiralerspong

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EDUCATION

Université de Montréal - *Master's of Science, Computer Science* *September 2021 - May 2023 (Expected)*
Focus on algorithmic game theory, machine learning and optimization.

McGill University - *Bachelor of Arts, Computer Science Major* *September 2017 - December 2020*
Minors in Mathematics and Economics **(Dean's Honor List, Top 10%) GPA: 3.92/4.0**

- Keyfitz Major Renewable Undergraduate Scholarship ($9000).

Notable Coursework: Honors Econometrics, Mathematical Foundations of ML, ML for Economics, Applied ML, Honors Probability, Artificial Intelligence, Honors Analysis (I-III), Honors Graph Theory, Algorithmic Game Theory, Algorithm Design, Cryptography.

SKILLS

Languages: Python, C++, Java, JavaScript, PHP, C, HTML/CSS
Frameworks: Linux, Git, Docker, NumPy, Pandas, Keras, Plotly, Streamlit, Scikit-learn, PyTorch, MySQL

WORK EXPERIENCE

Amazon Robotics - *(Returning) Software Development Engineer Intern* *May 2021 - August 2021*

- Developed C++ simulated robotic workcell capable of independently finding objects and picking them up with a robotic arm.
- Used RANSAC model and clustering algorithm to create a perception service that identifies objects from a pointcloud and computes an approach position/angle to pick them up in under 50ms.
- Integrated inverse kinematics solver with new data schema allowing for motion planning of robotic arm to arbitrary pick points.

Amazon Robotics - *Software Development Engineer Intern* *May 2020 - August 2020*

- Built C++ benchmarking system allowing for easy evaluation of CPU/GPU/Memory performance of different robotic configurations.
- Helped integrate third-party visual workflow builder with workcell architecture allowing for automatic generation of configuration files required by the system.

Squarepoint Capital - *Quantitative Developer Intern* *January 2020 - May 2020*

- Helped parallelize various data analysis/model interpretability (SHAP values, partial dependence of features, etc.) Python processes using Slurm jobs allowing for order of magnitude performance improvements.
- Created frontend for visualization of model performance (integrating with Q backend) using Streamlit.
- Dockerized backend of ML interpretability/data analysis tools and ported over to a more robust/scalable deployment on GCP.

PROJECTS

Crypto Futures Trading System - *Personal Project* *2021*

- Python websocket client, order book aggregator and order management system for cryptocurrency futures trading (Binance/FTX).
- Used it to implement medium frequency (<30ms execution) inter-exchange statistical arbitrage strategy.

Comparison of Neural Network Models for Interest Rate Forecasting - *Econ 420 Project* *2020*

- Evaluation of MLP, CNN and RNN model performance for interest rate forecasting using FRED-MD database.

Alternative Metrics for Generative Adversarial Networks - *COMP 598 Project* *2019*

- Analysis of various formulations of GANs, specifically the properties of the Kantorovich-Wasserstein and Cramér metrics and how they address many of the issues (mode collapse, gradient loss, etc.) found when using KL divergence.

Expanding SqueezeNet - *COMP 551 Project* *2019*

- Replication of SqueezeNet model architecture in PyTorch and evaluation of performance on smaller dataset (TinyImageNet).