Royce Moon

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EDUCATION

University of Michigan, Ann-Arbor

Fall 2022 - Spring 2025

B.S. in Computer Science, Minor in Complex Systems

EXPERIENCE

AbbVie

Machine Learning Intern | Apr 2022 - May 2023

- New Biological Entities (NBE) Analytical R&D Group
- Demonstrated the viability of ML applications to categorizing peptide mapping data of antibody drug conjugates
- Implemented proof-of-concept SVM, XGBoost, CNN, hierarchical clustering, and transformer models
- Saved 1000s of hours for analysts and research scientist
- Presented at internal cross-departmental symposium to an international audience of ~300 research scientists and VPs

Quant Illinois

Advisor, Board of Directors Member | Sep 2021 - Present

- Advising research in de-correlated signals in the equity space
- Former Head of Research in developing a PyTorch backtesting framework for mean-reverting portfolios using OU maximum likelihood estimation
- 501(c)3 Non-Profit appointed board member

Bedrock Assets

Software Engineer Intern | Feb 2022 - Apr 2022

- Engineered a live market data trading signal generation server using Python and WebSockets
- Developed in-house REST API using Tornado Framework integrated on AWS

CERN

Research Intern | Oct 2020 - Jun 2021

- Built from scratch and benchmarked frequency and time domain CNNs for multi-parameter estimation of binary black hole mergers from gravitational wave signals
- Results used in ongoing research at CERN following
 "Deep Learning Merger Masses Estimation from Gravitational Waves" and "Deep Learning Gravitational Wave Detection in the Frequency Domain" papers

smartnUp EdTech

Machine Learning Engineer Intern | Jun 2020 - Dec 2020

- Developed facial recognition attendance system for deployment in schools in Jaipur, India for approximately 2,000 students
- Developed pipeline for real-time facial recognition on CPU and android devices using Fast-MTCNN and TVM stack
- Developed integrated backend PostgreSQL database for pipeline

AWARDS

USA Computing Olympiad

2021 Gold Division

Nokia Bell Labs NJ Regional Science Fair

2020, 2019 Regeneron ISEF

- 3rd place Engineering Division
- 2x Winner Office of Naval Research Naval Science Award
- Geoscience Award

American Pre-College Philosophy Olympiad

2019 U.S. National Finalist

SKILLS

Machine Learning: Deep learning, NLP, computer vision, unsupervised learning, representation learning, manifold learning, autoencoders

Cybersecurity: Reverse engineering, fuzzing, malware analysis, static code analysis, web application & IoT security, OSINT

Foreign Languages: Fluent in Korean, professional proficiency in Mandarin Chinese

TOOLS

Programming Languages: Python, C++, C, Java, Rust, Huff, Solidity, Bash

Frameworks: NumPy, Pandas, Scikit-Learn, PyTorch, TensorFlow, Keras, Caffe, Flask

Software: Linux, Unix, Git, MySQL, PostgreSQL, MongoDB, AWS, Kubernetes, Docker, IDA Pro, REST APIs

PROJECTS

Laplace - Rust, Huff, Solidity

- A Uniswap V2/V3 generalized MEV trading bot implemented mainly in Rust
- Huff and Solidity contracts for unconventional gas optimizations
- Concurrent EVM simulations for locating sandwich opportunities
- Token dust, poison token checker, and circuit breaker
- Statistical arbitrage, sandwich trading, liquidation, flashloan, and front-running strategies

Shepherd - Python, Alpaca API, MongoDB, REST API

- a Python algorithmic trading bot with a command-line interface and REST API
- Wrote custom strategy class for integration with the REST API. Utilized strategy class to implement a simple example strategy (Payday Anomaly)

FCNN - Python, Keras, TensorFlow, PyCBC

 Implemented time and frequency domain CNNs to predict mass, spin, and eccentricity of black holes in binary merger events