Matthew Wang

#301, 2505 San Gabriel St., Austin, TX, 78705 • (217)-305-1574 • MatthewWang2020@u.northwestern.edu

EDUCATION:

Northwestern University

B.S. Computer Engineering

PUBLICATIONS:

Regime-Switching Factor Investing with Hidden Markov Models

- Modeled market as hidden Markov model (HMM) and classified hidden states based on S&P price and volatility
- Studied performance and consistency of factor models under different market regimes based on HMM classification
- Built factor-timing rotational trading model that invests/divests in factor models based on regime detection
- Analyzed portfolio benchmarking results to show how regime-switching investing shields portfolio from drawdowns

WORK EXPERIENCE:

Two Sigma

Quantitative Software Engineer

- Working on automated US options trading in Two Sigma's modeling engineering vertical
- Modeled the impact of discrepancies in recorded option volumes on volatility-forecasting trading strategies
- Built distributed system infrastructure for delta logs retrieval and aggregation from bare-metal trading hosts

Google

Software Engineering Intern

- Worked on Google Ads traffic estimation predictive modelling infrastructure in C++
- Devised a multivariate linear regression model forecasting ad "conversions" based on campaign performance metrics
- Built monitoring validation that applies predictive modeling to past data to contrast output with ground-truth data
- Worked on RPC infrastructure and data generation pipeline to support ad forecasting models

Facebook

Software Engineering Intern

- Consolidated and refactored Messenger Core Graph heuristics for more efficient message processing
- Built internal killswitch in Hack/PHP that controls individual Messenger Core Graph rule mechanisms
- Built cross-platform thrift service in C++ that unifies Messenger/Instagram Graphs for message processing

NASA

Software Engineering Intern

- Trained feed-forward neural networks and conducted supervised learning using BrainJS with NASA asteroid data to predict asteroid harmfulness
- Created data visualization plots with Matplotlib for presentation and analysis of model results
- Worked on IoT GPS location-tracking software for NASA vehicles in Java on the AndroidThings OS

QUANTITATIVE RESEARCH:

Finish Line Inc. Quantitative Modeling

- Implemented predictive models for Finish Line Inc. (\$1.44B valuation) to identify optimal markdown prices
- Conducted t-tests and used p-values to identify key features for classification and cumulative margin prediction
- Built nonparametric regression tree models with scikit-learn to regress product features to predict demand and tested models with k-fold cross validation

Northwestern University Knight Lab Research

- Building automated fact-checker that collects audio data from news sources and verifies its authenticity
- Implemented script to cross-reference news claims with AWS Transcribe and Google Fact-checking APIs
- Built Alexa skill as user interface for users to make vocal queries for facts pertinent to the news source

<u>SKILLS:</u>

Relevant Skills: Time Series Analysis, Signals and Systems, Factor Models, Modern Portfolio Theory, Machine Learning, Signal Processing, Engineering Statistics, Differential Equations, Linear Algebra, Multivariable Calculus, Operating Systems **Programming:** C++, Java, Python (Numpy, Scikit-Learn, Scipy, Pandas), C#, C, Javascript

Apr. 2019 ~ June 2019

Jan. 2020 ~ March 2020

New York, NY Aug 2020 ~ Present

Evanston, Illinois

December 2020

June 2020

Los Angeles, CA

June 2019 ~ Sept 2019

Jan 2019 ~ Apr 2019 ssing

Houston, TX

Menlo Park, CA

June 2018 ~ Aug. 2018

1ug 2020 ~ Present