

KATHERINE (YICHENG) HONG

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EDUCATION

NEW YORK UNIVERSITY

New York, NY

The Courant Institute of Mathematical Sciences

M.S. in Mathematics in Finance (expected Dec 2022)

- **Expected Coursework:** statistical arbitrage, Black-Scholes, derivative pricing, Greeks, interest rate models, swaps, Monte Carlo, mean-variance optimization, Fama-French

ECOLE POLYTECHNIQUE

Palaiseau, France

Coursework in Artificial Intelligence (Sep 2020-Mar 2021)

- **Coursework:** random forest, k-means, xgBoost, neural networks, PCA, SVD, Deep Q Learning

PRINCETON UNIVERSITY

Princeton, NJ

B.S.E. in Electrical Engineering, Minor in Applied Mathematics (Jun 2020)

- **Coursework:** neural networks, convex optimization, expectation maximization, natural language processing, information theory, probability and statistics, algorithm and data structures

EXPERIENCE

EVARINVEST ASSET MANAGEMENT

Paris, France

Quantitative Analyst Intern (Apr-Jun 2021)

- Designed a Python script that computes portfolio values of VIX UX1 rolling futures on 5-minute intraday data and back tested multiple edge cases
- Programmed a script that calculates implied volatility of options using inverse function of Black-Scholes formula and reached 100% accuracy on liquid options
- Predicted VIX prices using LSTM models and 30,000 5-min intraday data with mean squared error 40% lower than dummy model

PRINCETON CENTER OF STATISTICS AND MACHINE LEARNING

Princeton, NJ

Research Assistant to Director (Jun-Aug 2019)

- Leveraged information theory, linear algebra and integration techniques to realize mathematical proofs of mode collapse reduction in modified generative adversarial networks (GANs)
- Constructed PACGAN and VEEGAN models using Python and convoluted neural networks
- Generated images of digits 0-9 from 60,000 input digit images and reduced mode collapse by 10%

PROJECTS

ECOLE POLYTECHNIQUE

Palaiseau, France

Reinforcement Learning in Card Game Landlord (Python) (Mar 2021)

- Programmed deep Q learning and NFSP agents to play a 3-player card game landlord with state space of size 450 and action space of size 309
- Defeated random agents 60% of the times out of 100,000 timesteps

Upper Bound of Generalization Error in Machine Learning (Mar 2021)

- Applied Probably Approximately Correct framework and Radamacher complexity to determine generalization error upper bound in machine learning

PRINCETON UNIVERSITY

Princeton, NJ

Text Generation Model to Create Poetry (Python) (Oct 2019 – Apr 2020)

- Generated Walt-Whitman styled poems using LSTM models with dataset of 4000 poems
- Obtained meaningful, coherent generated text with perplexity level 14% lower than original text

Sentiment Analysis in Code-Switching Tweets (Python) (Dec 2019)

- Classified positive or negative sentiments in 15,000 English-Spanish mixed tweets using unigram language model and logistic regression
- Reached test accuracy of 55.8%, the top participant in the competition being only 10% higher

COMPUTATIONAL SKILLS/OTHER

Programming Languages: Python, Tensorflow, Java, Minizinc

Languages: Proficient in English and Mandarin, Conversational in French