COLIN SWANEY

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Finance Ph.D. with five years experience in quantitative research and development across academia and industry. Creator of Prickle, an open-source Python toolkit that streamlines the process of building massive datasets for high-frequency trading research.

SKILLS

Python • TensorFlow • Julia • JavaScript • SQL • Git • AWS • Linux • Machine Learning • Bayesian Statistics • Econometrics • Data Visualization • Problem Solving • Communication • Teamwork

EXPERIENCE

NOVA CREDIT | New York NY

Data Scientist Jan 2020 - Present

Led model development for a Series B startup that helps immigrants use their international credit history in the U.S. Collaborated with engineering and business development teams to build a new product that estimates consumer income from bank transaction data (in pilot with a leading lender).

- Devised an algorithm to identify the key factors impacting immigrants' international credit scores
- Proposed and implemented a Bayesian method to map foreign credit scores into U.S. equivalents
- Created the front-end and back-end of an internal analytics web application

JACOBS LEVY EQUITY MANAGEMENT | Florham Park NJ

Quantitative Research Analyst June 2018 - May 2019

Contributed to building the infrastructure of a global investment unit at a distinguished asset management firm. As a member of a small team, worked autonomously on full-stack development tasks and researched potential applications of machine learning to improve investment outcomes.

- Implemented distributed hierarchical Bayesian regression algorithms (Julia), resulting in a 10x reduction in training time
- Built a web application in JavaScript (Vue.js, Highcharts.js) to visualize data and evaluate model performance
- Applied neural networks (TensorFlow) to increase stock return prediction accuracy by 200%
- Led tutorials on machine learning for portfolio managers and research analysts

UNIVERSITY OF MISSISSIPPI | Oxford MS

Visiting Assistant Professor August 2017 - May 2018

Taught approximately 300 undergraduate students across six financial management courses. Performed all teaching duties efficiently, allowing completion of dissertation.

- Created all course materials, including handouts, homework, exams, and websites
- Introduced "flipped" classroom teaching methods to increase student engagement

CONVERSANT MEDIA | Chicago IL

Data Scientist May 2016 - August 2016

Researched the real-time bidding platform of a leading digital marketing firm.

- Wrote SQL queries to analyze raw and derived Internet-scale data
- Created statistical models to predict the effects of changing key algorithm parameters

EDUCATION

UNIVERSITY OF IOWA — TIPPIE COLLEGE OF BUSINESS | Iowa City IA

Doctor of Philosophy, Finance May 2018

- Specialized in Computational Finance and High-Frequency Trading
- Relevant Coursework: Econometrics, Applied Econometrics, Finance Theory, Advanced Empirical Finance, Computational Intelligence, Big Data Analytics, Computer Intensive Statistics

UNIVERSITY OF IOWA | Iowa City IA

Master of Science, Mathematics May 2011

- Specialized in Applied Mathematics and Computational Science

KANSAS STATE UNIVERSITY | Manhattan KS

Bachelor of Science, Mathematics and Economics (double major) 2009

- Captain, Track & Field and Cross Country

RESEARCH

"PRICE FORMATION AND THE SHAPE OF THE LIMIT ORDER BOOK," *WORKING PAPER*

- Applied machine learning to explain why the shapes of limit order books predict price movements
- Built a Python package that reconstructs limit order books from raw high-frequency data
- Analyzed a multiple terabyte database using high-performance computing resources

"A POISSON NETWORK MODEL OF ORDER BOOK EVENTS," *WORKING PAPER*

- Developed an econometric model to simulate high-frequency trading activity
- Implemented inference algorithms in Python, using Cython to realize a 50x speed-up
- Demonstrated a 300% improvement over the baseline model across stocks in the S&P 500

"EVALUATING FUND MANAGER SKILL: A MIXTURE MODEL APPROACH," *DISSERTATION CHAPTER*

Accepted at R/Finance 2016: Applied Finance with R

- Disentangled skill from luck in the mutual fund industry using machine learning
- Wrote SQL queries to obtain mutual fund data from Wharton Research Data Services
- Generated R scripts to run clustering algorithms and backtest portfolio performance

PUBLICATIONS

"EFFICIENT SKIN SEGMENTATION VIA NEURAL NETWORKS: HP-ELM AND BD-SOM," SWANEY ET AL., *PROCEDIA COMPUTER SCIENCE* 53: 400-409

Presented at International Neural Network Society (INNS) Big Data 2016

- Designed and implemented a neural network-based algorithm to perform a computer vision task
- Combined GPU programming (CUDA) with MATLAB to classify images in real-time (100x speed-up)