Andrew **Wu**

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Work Experience

Optiver APAC

Sydney

Quantitative Researcher *Feb. 2022 - present*

- Implemented end-to-end solution for pricing vwap-settled Indian Single Stock Options: derived novel pricing formula with stochastic calculus, implemented model in C++ and managed deployment process
- Implemented new algorithm for autotrader spline generation, improved stability and performance by 2x
- Improved dividend split pricing for American options under a trinomial tree model
- Improved dividend simulations for risk monitoring by implementing new calculations with comparisons to independent dividend sources
- Applied machine learning techniques to produce implied volatility forecasts, used in trader-informed fairs and automated vol trading strategies
- Improved model performance through implementation of novel index features and deep dived data for feature analysis
- Prototyped modelling component of data pipeline for training ensemble machine learning models for volatility forecasting

UNSW Business School

Casual Academic *Feb. 2020 - Dec. 2021*

- Tutor for ACTL3182 and ACTL2111. Taught topics such as binomial tree models, stochastic calculus, the Black-Scholes model, and developed [supplementary resources] in LaTeX

ARC Centre of Excellence in Population Ageing Research

Summer Research Intern *Dec. 2020 - Feb 2021*

- Used non-linear optimisation, dynamic programming, and stochastic control to solve retirement spending utility optimisation

Education

University of New South Wales

Honours WAM: 93.4

B. Advanced maths (Honours in Statistics, Major in Applied Mathematics)/Actuarial Studies *Feb. 2017 - Dec. 2021*

- Honours Thesis in defaultable options pricing with PDE methods
- Derived novel result for combining continuous default density with jump condition and implemented finite difference and deep learning numerical solvers
- First in applied mathematics pre-honours, first in Stochastic Differential Equations, scored 100 in Data Structures and Algorithms, Deans List in 2017/2019, Scientia and School of Mathematics Scholarships

University of California, Los Angeles

Applied Mathematics, GPA: 4.0 *Sep. 2018 - Dec. 2018*

- UCEAP Reciprocal Exchange, Bruin Home Solutions Sustainable Engineering Society, Bruin Hyperloop Club

Achievements

2021 **Deep Learning Specialization**, Coursera, Deeplearning.ai. [Credential]

2020 **Certificate in Machine Learning**, Coursera, Stanford University. [Credential]

2017 **Encore Musician**, Performed at Opera House for outstanding HSC performance in classical piano

Personal Projects

Option Pricing with Fourier Transform Methods

Paper Implementation

- Implemented Fourier transform pricing methods for European Vanilla options in python under Variance Gamma process based on Carr and Madan, 1999
- Analysed and compared methods with Monte-Carlo simulations and the Black-Scholes formula

Technical Skills

Programming languages, libraries and developer tools

- Competent in C++, Python, Latex, familiar with C, R, MATLAB
- Competent in Pandas, Sklearn, Numpy, Matplotlib, Jupyter
- Competent with Git, Bash, Linux
- Familiar with Pytorch, Tensorflow, Keras, XGBoost