Harvey Huang

Doctorate Candidate in Decision, Risk and Financial Science

hsjharvey@gmail.com | hsjharvey.github.io | hsjharvey | harveyhuang

About Me

- **Technical Skills**: Python · Golang · C# · Solidity · LaTeX | **Frameworks**: OpenAI Gym · Tensorflow · Unity WebGL · WebSocket
- **Language**: Mandarin (native) · English (fluent, IELTS 8.0) | **Interests**: Tennis · Basketball · Esports

Education

University of Melbourne

Melbourne, Australia

PhD in Decision, Risk and Financial Sciences · BCOM Honours in Finance (2016) · First Class Honours

Jul. 2012 - Jul. 2022 (expected)

- PhD: Australian Government Research Training Program (RTP) Scholarship.
- BCOM: Melbourne International Undergraduate Scholarship · Melbourne Global Grant Scholarship.
- Exchange to Marshall School of Business, University of Southern California (Jan. 2014 - Jun. 2014) · GPA: 3.8/4.0.

Research and Work Experience

Brain Mind and Markets Lab

Melbourne, Australia

PhD · Tutor

Jul. 2017 - NOW

- Conducted research to evaluate the performance of traditional and distributional reinforcement learning algorithms in a multi-armed bandit task with tail risks. Identified the source of failure, and proposed solutions to improve the existing reinforcement learning algorithms based on statistical methods (all in Python).
- Designed an online multi-armed bandit human behaviour experiment with different reward distributions (Gaussian, student-t, exponential). Conducted analysis on why humans could efficiently estimate mean values and make effective decisions under different environments.
- For the online experiment, implemented the UI client (Unity WebGL) and the server (Go & Python). Established a dual-way connection between the client and the server using WebSocket protocol and goroutine/asyncio, with the capacity of running multiple experiment sessions at the same time. Implemented the data generating process by adding a C++ native plugin to the WebGL client.
- Tutored Foundations of Fintech (BlockChain, Robo-Advisor, Natural Language Processing, Credit Analysis) · Derivative Securities · Corporate Financial Policy · International Finance.

Deloitte Consulting

Shanghai, China

Intern · Data Analyst

Feb. 2017 - May. 2017

- Assisted senior consultants to provide a strategic advisory service on smart city planning projects to one of the state governments.
- Created a web-scraping script (Python Scrapy) to automatically collect data from websites. Cleaned and filtered the raw data for analysis.
- Performed exploratory data analysis and model analysis using linear regression & non-supervised models.

Publication

- Peter Bossaerts, **Shijie Huang** & Nitin Yadav. *Exploiting Distributional Temporal Difference Learning to Deal with Tail Risk*. 2020. Risks, 8(4), 113.

Projects

Option Pricing (Python)

- Implemented option pricing using binomial model, Black-Scholes-Merton model, Longstaff-Schwartz model, covering European, American and Exotic options.
- Implemented simulation of asset price (with Poisson jump), volatility (Heston) and interest rate (Vasicek, CIR).

Reinforcement Learning (Python)

- Implemented deep reinforcement learning algorithms, including DQN, A2C and distributional DQN (Categorical C51, Quantile and Expectile).
- Wrote a detailed guide and discussion on practical implementation of all three distributional DQN models.

Cryptocurrency (Python)

- Established WebSocket connections with multiple crypto exchanges (Binance, CoinJar, OKEx) and Interactive Brokers. Using asyncio, asynchronously extracted real-time spot and futures price & volume data from multiple exchanges.
- Monitored and calculated real-time cross-exchange and triangular arbitrage opportunities across multiple asset classes.

BlockChain (Golang & Solidity)

- Implemented a mini Ethereum based blockchain system from scratch, covering detailed steps including creating private-public key pair, initiating transactions, miner transaction verification and block mining.
- Created a smart contract token on Ropsten test network, using Solidity OpenZeppelin framework (see EtherScan).