Rahul Venkatesh

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Education

National University of Singapore (NUS) — Singapore
Master of Science in Data Science and Machine Learning (GPA: 4.8/5) — *Aug 2023 - Present*

Indian Institute of Technology (IIT), Delhi — New Delhi, India
Bachelor of Technology in Computer Science and Engineering (GPA: 7.37/10) — *Jul 2016 - Jun 2020*

Technical Skills

Languages: Python, C++, SQL, Bash

Tools/Software: TensorFlow, MongoDB, MySQL, OpenMP, CUDA

Work Experience

Squarepoint Capital — Paris, France
Software Engineer — *Aug 2020 - Jun 2023*

- Developed and supported **low-latency** order entry gateways (OEG) for algorithmic trading in production.
- Built new OEGs to $5+$ **exchanges**, including **CME, ICE** and **OSE** over OUCH and FIX protocols.
- Designed frameworks for trading 2 new asset classes: **bonds** and **non-deliverable forwards (NDF)**.
- **Improved performance** of gateway application by **collecting and analysing** latency-related **data**.

Projects

Option Pricing

- Developed n-step **Binomial Option Pricing Model** as a discrete version of Black-Scholes model.
- Implemented **Least-Square Policy Iteration** (RL) to learn optimal exercise policy for American options.
- Applied LSTDQ to compute expected payoff upon continuation using Laguerre polynomials as **feature maps**.
- Computed **greeks** and conducted sensitivity analysis of option price w.r.t parameters r, τ, and σ.
- Applied real data to derive risk-free rate and implied volatility, closely matching computed and market prices.

Stock Price Prediction

- Conducted time series analysis with **seasonal decomposition** and **stationarity** tests to identify patterns.
- Employed **Moving Average** and **Exponential Smoothing** to approximate prices and remove noise.
- Utilized diverse forecasting methods, including **ARIMA** and **LSTM** (Recurrent Neural Network).
- Tested models against historical data to assess predictive performance and validate effectiveness.

MiniMovieDB

- Developed a **MongoDB** database for managing and storing information about shows, actors and user events.
- Designed **aggregation pipelines** to extract valuable insights, such as identifying popular shows and actors.
- Enhanced query performance by strategic **indexing** and optimized regex searches for faster data retrieval.

Relevant Coursework

Probability and Stochastic Processes, Differential Equations, Optimization Algorithms for Data Modelling, Machine Learning, Applied Regression Analysis (In Progress), Modelling and Numerical Simulations (In Progress), Numerical Methods in Quantitative Finance (In Progress)