

Sheryl Ng

Economics and Data Science

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Summary

I am a penultimate-year Economics and Data Science undergraduate, actively seeking internship opportunities to gain hands-on experience in machine learning, particularly in building predictive models and exploring their applications in economic forecasting and decision-making. Additionally, I am deeply interested in quantitative finance and aspire to contribute to projects that integrate data science techniques into financial modeling, risk analysis, and investment strategies. As a motivated and hardworking individual, I am eager to expand my expertise in leveraging programming and analytical tools to address real-world economic and financial challenges.

Skills Info

Econometrics

- Applied linear and nonlinear regression techniques to test micro, macro, and financial economic hypotheses.
- Developed methods for estimating causal effects using real economic data, analysed with Stata.

Financial Economics

- Explained key concepts in investments and portfolio construction from a financial economics perspective.
- Designed and analysed investment portfolios, performing comprehensive security analysis.

Machine Learning

- Cirrhosis Prediction:
Predicted early or late-stage liver cirrhosis by comparing models such as Random Forest, Logistic Regression, kNN, and Bagging Classifier.
Libraries: scikit-learn, pandas, seaborn, matplotlib, sklearn.metrics.
- Human Mobility Prediction:
Designed Convolutional Neural Networks (CNNs) and Long Short-Term Memory deep learning model to predict missing data in human mobility datasets.
Libraries: TensorFlow, Keras, pandas, matplotlib, seaborn.
- Recommender Systems:
Together with a team, built and evaluated and compared the results (computational costs and accuracy) of TF-IDF, Neural Collaborative Filtering, Weighted Hybrid, Deep Neural Network models
Libraries/Tools: TensorFlow, PyTorch, scikit-learn, pandas, numpy, scipy, tqdm

Reinforcement Learning

- Built a reinforcement learning agent for the CliffBoxPushing grid-world game using Q-learning.
 - Developed policies to maximise cumulative rewards in an episodic task while balancing exploration and exploitation.
 - Implemented reward shaping and hyperparameter tuning for improved performance.
- Applied Monte Carlo methods to evaluate policy performance and estimate action-value functions by sampling returns from episodic trajectories.
 - Simulated and visualised state-action transitions to validate learning outcomes and model accuracy.

Data Mining

- Gained exposure to:
 - key data mining techniques, including clustering (K-means, DBSCAN), graph-based methods (PageRank, community detection), and association rule mining (Apriori, FP-tree) and classification models (Decision Trees).
 - introductory concepts in ETL processes and data warehousing for practical applications.

Quantitative Economics & Data

- Utilised advanced econometric methods such as GARCH models and Ljung-Box tests for hypothesis validation to test economic theories, including EMH, Random Walk, CAPM, and FF3, addressing CAPM's inadequacies.
- Libraries: statsmodels, numpy, pandas, scipy.

Data Visualisation

- Designed impactful visualisations using D3.js, Tableau, and Python for enhanced data storytelling and user engagement.
- Created interactive dashboards to drive insights and recommendations..
- Libraries: matplotlib, seaborn, plotly.

Programming & Algorithms

- Python & C:
 - Implemented algorithms such as Heap Sort, dynamic programming, and graph traversal to optimise problem-solving.
 - Designed data structures like recursion and linked lists for computational challenges.
- SQL:
 - Wrote complex queries for data retrieval, manipulation, and organisation within relational databases.
 - Familiar with DBMS concepts, relational models, normalisation, and relational algebra.

Excel & VBA

- Applied quantitative reasoning and linear models to analyse data for decision-making.
 - Automated repetitive tasks using VBA macros, improving data processing workflows.
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Experience

Singapore Land Authority

September 2024 - December 2024

Finance Automation Intern

- Keeping updated with RPA best practices, collaborate with the finance team to design, develop, and maintain UiPath automation scripts to streamline finance processes.
- Testing and debugging of existing RPA scripts to ensure that they meet performance standards.
- Create comprehensive documentation for the developed RPA solutions, including process maps, workflow diagrams and user guides to facilitate knowledge transfer and support.
- Fine-tune a chatbot to retrieve accurate answers from the company's Financial Regulation Manual, streamlining officers' access to information and significantly reducing the time spent searching for relevant content.
- Utilise prompt engineering techniques and retrieval-augmented generation (RAG) to improve chatbot accuracy and responsiveness.

Nanyang Technological University

August 2024 - October 2024

Student Research Assistant

Research objective: Current Large Language Models (LLMs) are weaker in achieving social and cognitive abilities due to the lack of intention. Hence this research proposes that Speech Act can be adapted in LLM AI to convey intention. This research takes place in the context of Autonomous Vehicles (AVs) .

- Integrate APIs (e.g., OpenAI, Spotify, Google APIs) using Python libraries such as spotipy and openai, enabling seamless connections between LLM models and user-requested services (e.g., music retrieval).
- Leverage text-to-speech functionality to enable dynamic, conversational interactions with users to create a seamless experience for participants during the experiment.

Macroeconomic Analysis of Investment Portfolios Intern

- Identified key macroeconomic indicators used to track various macroeconomic dimensions (e.g., inflation, business cycle, risks, market expectations) and understand how they are used in portfolio monitoring and decision-making on tactical positioning.
 - Understand how a buy-side client runs an investment programme (e.g., dynamics of relationship with external managers, monitoring and reporting protocols, discussions on adjustments to the investment parameters as part of programme evolution).
 - Effectively utilised the functions and features within Excel (e.g., pivot tables) to create dashboards that deliver easily comprehensible visualisations that communicate insights effectively and at-a-glance.
 - Identified key factors for evaluating an asset's current status and potential risks, incorporating them into credit monitoring reports.
 - Identify the potential impacts of new company information, such as press releases, on the performance of its bonds.
 - Through language precision and appropriate visual aids (e.g., sparklines), effectively presented information to maximise its impact and clarity.
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Academic Qualifications

Nanyang Technological University

2022 - 2026

Bachelor of Science - BS, Economics and Data Science

Grades: Honours (Distinction), 4.49/5.00

Raffles Institution (JC)

2020 - 2021

Economics (H2) | Mathematics (H2) | Chemistry (H2) English Language and Linguistics (H2)

General Paper (H1) | Project Work (H1)

Nan Chiau High School

2016 - 2019

Attained the Edusave scholarships for Independent Schools (ESIS) which is awarded to the top 5% of all students who sat for the O-Level examinations based on L1R5 scores before any bonus points

Co-curricular Activities

NTU Economics and Data Science Club

2024 - Present

Vice-president

- Co-founded the club focused on fostering collaboration among students taking the degree.
- Spearheaded the organising of networking events.
- Currently developing a website to serve as a resource hub and communication platform, enabling students to access valuable materials and engage with the club.

NTU Investment Interactive Club

2024 - Present

Member

- Attend weekly lessons on investment skills and strategies.

Welfare Services Club Regular Service (Deaf Community)

2023 - 2024

Regular volunteer

- Completed up to Singapore Sign Language (SgSL) level two to provide higher quality tuition for children from the Deaf community.

School of Social Sciences

2023 - 2024

Social Director

- Entrusted with the responsibility of the planning and execution of social activities, functions, and events that are consistent with the objective of promoting a cohesive and dynamic school environment.
- Serving as the liaison person between the Club and other Academic Constituent Clubs of the NTU Students' Union, for collaborative social events.

Project Love Language

2021

Co-founder

- Spearheaded a fundraiser, Project Love Language, in collaboration with TOUCH Community Services.
- Sourced materials needed and assembled every Lego Heart keychain and necklace sold.
- Raised double the expected funds with over 100 necklaces and keychains sold.

Beyond Social Services

2018

- Gave a pitch for a project I spearheaded and was granted a seed funding of \$1600 under the YMCA Youth For Causes 2018 Programme.
- Organised door-to-door fund-raisers, a haunted house for a fund-raiser carnival as well as sessions at the centre to spend time with the children there.