Eshaan Trehan

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LINKS

LinkedIn, Portfolio, GitHub

PROFILE

Recent graduate and emerging software engineer with strong skills in quantitative analysis, algorithm development, and machine learning. Experienced in applying data-driven solutions across academic and internship projects, particularly in the financial sector. Proficient in Python, Java, Spring Boot, and cloud technologies, with a demonstrated ability to contribute to technical projects and optimise processes.

EMPLOYMENT HISTORY

Jul 2024 — Present

Quantitative Research Consultant, WorldQuant

Remote

- Developed over 15 trading strategies (Alphas) using quantitative finance models for U.S. and China markets.
- Conducted 10-year market data backtesting, analysing performance metrics such as Sharpe ratio, turnover, and returns.
- Selected from the top 1% of WorldQuant Challenge participants for exceptional performance in quantitative research.

May 2023 — Sep 2023

Software Engineer Intern, Bloomberg

Dublin, Ireland

- Streamlined deployment processes by managing CI/CD pipelines using Jenkins, facilitating 50+ deployments.
- Improved service functionality by rectifying critical bugs, adding health endpoints, and implementing time control features across 20+ services using Java and Spring Boot.
- Automated file generation by creating FreeMarker templates, enhancing file conversion workflows from DataPhile to JSON.
- Boosted UI integration with Kubernetes services by 85% through enhancements in JavaScript and system architecture.

Jul 2021 — Sep 2024

Software Engineer Intern, Vantage Circle

New Delhi, India

- Enhanced an internal expense management tool hosted on GitHub, improving backend and database integration.
- Executed SQL queries using Python's API for PostgreSQL and conducted research on Apache Calcite for optimising internal processes.

EDUCATION

Sep 2020 — May 2024

Bachelors in Computer Engineering, Trinity College Dublin

Ireland

Relevant Coursework: Data Structures & Algorithms, Deep Learning, Probability & Statistics, Software Design, Data Visualisation, Computer Architecture.

KEY PROJECTS

Biomedical Imaging AI for Cancer Tumour Segmentation & Classification
Python, Keras/TensorFlow, NumPy

- Developed a CNN model for classifying cancer tumour images, achieving **86.04% accuracy** on a diverse dataset, utilising advanced data augmentation techniques and hyperparameter tuning to optimise performance.
- Implemented a deep learning model for tumour segmentation, reaching **96.70% segmentation accuracy** with an **F1 score of 0.922**, employing architectures like U-Net for accurate and detailed boundary detection of tumours.
- GitHub Link

Stock Predictor & News Sentimental Analysis
Python, Streamlit, Pandas, Transformers

Achievements:

- Built a neural network (LSTM) for stock price prediction, incorporating news sentiment analysis using **FinBERT** to provide a more holistic forecast by considering market sentiment alongside historical price data.

- Deployed a real-time interactive dashboard via **Streamlit**, achieving **<5% RMSE** over 100+ iterations, allowing users to dynamically visualise stock predictions and understand the influence of news sentiment on market trends.
- GitHub Link

Interactive Map Application
JavaScript, Node.js, Express.js, Multer, Leaflet

- Developed a dynamic web-based mapping tool that allows users to add markers, polyline routes, and file uploads.
- Integrated geospatial data editing tools and optimised the user interface for interactivity.
- GitHub Link

Decentralized P2P Chat App
Python, Socket Programming, Threading, Hashlib

- Created a decentralized P2P chat application using Python, with secure communication enabled by SHA-256 encryption.
- Implemented NAT hole-punching to allow seamless peer communication over a distributed network.
- Led a 4-member team, overseeing project planning and task delegation.
- GitHub Link

Investment Strategy Analysis Dashboard
Python, Streamlit, Pandas, NumPy

- Developed an advanced financial analysis dashboard for real-time portfolio tracking and risk assessment.
- Calculated financial metrics like Geometric Mean Return, Volatility, VaR, and CVaR for detailed portfolio performance analysis.
- Deployed a user-friendly interface with Streamlit, allowing for dynamic adjustments of financial parameters.
- GitHub Link

Client Health Endpoint Enhancement
Bloomberg (Internship Project)

- Added advanced features to health endpoints, improving system monitoring and client service reliability.
- Resolved multiple bugs, ensuring system reliability and optimised performance for client services.

KEY SKILLS

- **Programming Languages**: Python, Java, C/C++, JavaScript, SQL, HTML, CSS
- **Frameworks & Tools**: Spring Boot, Jenkins, FreeMarker, Antlr, Node.js, Express.js, Streamlit
- **Quantitative & Data Analysis**: Risk Metrics (Sharpe Ratio, VaR, CVaR), Machine Learning (Keras, TensorFlow, Scikit-learn), Sentiment Analysis (FinBERT)
- **Database & DevOps**: PostgreSQL, MongoDB, Docker, Kubernetes, GitHub
- **Other Tools**: Pandas, NumPy, LSTM, Apache Calcite, Time Series Analysis, Matplotlib, Plotly
- **Soft Skills**: Problem-solving, Analytical Thinking, Team Collaboration, Communication, Time Management, Adaptability

CERTIFICATIONS

- **Python for Everybody Specialisation** — *University of Michigan* | **2022**
- **Blockchain and Cryptocurrency Explained** — *University of Michigan* | **2022**
- **Trading Algorithms** — *Indian School of Business* | **2022**
- **Algorithmic Toolbox** — *University of California, San Diego* | **2022**

ADDITIONAL INFORMATION

- Fluent in English, Hindi, and French (DELF A1 & A2)
- Member of ACM and Enactus at Thapar University (2020-2022)