

Frederick Searancke

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EDUCATION

University of Warwick

Sept 2024 - Jun 2027

Computer Science | First-class degree expected

A Levels

2024

A*AAA in Mathematics, Further Mathematics, Physics and Computer Science

QUANTITATIVE RESEARCH AND TRADING

Machine learning for volatility forecasting

- Developed interpretable machine-learning models to forecast final-hour realised volatility in E-mini S&P 500 futures, learning corrections to a realised volatility baseline.
- Built chronological walk-forward evaluation with quarterly retraining; tested stability across random seeds, training windows and market periods to challenge overfitting.
- Integrated forecasts into strategy backtests with trading costs and slippage modeling; evaluated correlations and drawdowns when combining options strategies.

Options research and strategy evaluation

- Analysed 827 historical same-day-expiry S&P 500 index option spread trades; combined price, volume and volatility data in Python/SQL and investigated feature redundancy and model instability.
- Backtested trend-following and volatility strategies in QuantConnect, evaluating out-of-sample performance after modelled slippage and trading costs.
- Applied hypothesis tests to backtest results, identifying statistically significant trend-following performance before slippage and trading costs.

Live automated options trading

- Developed and operated Python bots trading index option credit spreads with personal capital through Interactive Brokers.
- Collected \$2,912 in additional premium across 66 filled spreads in NDX, SPX and RUT; filled 21.3% above the quoted bid/ask benchmark.
- Designed safeguards and logging; and evaluated the system against some internal state logs from Interactive Brokers. Cross-checked calculations and execution against independent platforms such as Tastytrades and Quant Connect and Trading View.

SOFTWARE EXPERIENCE

Samara James | Contract Software Developer

Jun 2024 - Aug 2024

- Developed the Python backend for an AI sales assistant, combining fine-tuned GPT-4o with a product retrieval system for the company's live-chat workflow increasing customer live chat engagement by 15%.
- Converted 5,000+ customer conversations into a curated training dataset and implemented vector search across 698 products and company policies.
- Improved the model through staff feedback and data curation; the head of sales judged its conversational quality, knowledge and sales technique comparable to trained staff.

Commercial product automation | Python and Blender | [see results here](#)

- Built an automated 3D-model-product pipeline to turn AI generated images into saleable 3D models; **100+ original designs** generated £1,100+ in sales.

SKILLS AND ACHIEVEMENTS

Technical: Python, SQL (DuckDB), Java, NumPy, InterpretML and QuantConnect.

Modelling: Interpretable ML (Explainable Boosting Machines), Gamma regression, regularisation and statistical testing.

Achievements: Saxon Novices men's senior foil winner (2026), **1st of 22**, unbeaten 12-0; 5+ years volunteering to teach Python; BASI Level 1 ski instructor; Gold Duke of Edinburgh's Award.