

ANDREW BEAVEN

DATA SCIENTIST AND QUANTITATIVE ANALYST

A creative quantitative analyst with vast experience in all aspects of portfolio management, complex financial instrument valuation and macroeconomic analysis. Current research focus being the application of Artificial Intelligence to detect patterns in financial markets. Devised profitable trading signals and algorithms across all asset classes. A life-long autodidact, well-read in both theoretical and practitioner literature, having successfully blended traditional econometrics with Machine Learning concepts. Experienced in derivatives trading, managed and trained junior quants in the role of Chief Investment Officer. Developed original mathematics for estimation error corrected statistical optimisations, with focus on portfolio construction (documentation available).

Recent Experience

CONSULTANT: ARTIFICIAL INTELLIGENCE APPLICATIONS IN TRADING STRATEGIES

AI Trading

March 2020 –Present

- Trading signals based on Pattern Recognition (Equities,FX,Bonds).
- Currently finalising journal paper on robust portfolio optimization – have developed a novel approach to robust estimation. Methodology outperforms all alternatives in the literature. Have applied this approach successfully to linear and logistic regression.
- Continued refinement of state-space modelling for trend identification.

SENIOR ARTIFICIAL INTELLIGENCE ANALYST

CORTEX LOGIC

Dec 2017 – March 2020

Developed high return low risk investment strategy for FX, equities, indices, commodities and bonds. trading algorithms, using state-space methods. Primary goal being positive convexity. Complementary dynamic algorithms developed to hedge drawdowns in “primary” algorithms. Made use of fundamentals (PE ratios/earnings/other), mean reversion and momentum metrics. Blended traditional statistical modelling with artificial intelligence for model building.

- Multi-period momentum/trend identification via state-space modelling combined with dynamic time warping (supervised pattern matching)
- Utilised unsupervised learning for portfolio optimization and price pattern matching signals
- Exxaro Project: Designed AI model architecture of demand, supply and price prediction of coal. Dynamic marketing strategy for coal export operations driven by model.
- Implemented ‘intelligent’ digital customer communication for retail chain.

Quantitative Analysis - Core Technical Skills

MACHINE LEARNING

• Pattern Recognition via Dynamic Time Warping and NN weighting • Ridge/Lasso regression • logistic regressions • discriminant analysis • random forest regression and classification • naïve/gaussian Bayes classifiers • Kernel SVM • k-NN regression • clustering • association learning • reinforcement learning • deep-learning neural networks • hidden Markov chains • bagging, boosting, ensembles, stacking.

PROGRAMMING LANGUAGES

Primary : MATLAB Also: Python R VBA C++ C#

QUANTITATIVE FINANCE

• HJB Dynamic Optimization • parametric and non-parametric asset return prediction models • Algorithmic Trading via State-Space Methods • stochastic calculus • finite difference methods for PDEs • vanilla and exotic derivative valuation • equity factor risk modelling • Estimation Error Informed Portfolio Optimization • ALM/balance sheet management • Management of fixed income portfolios via Duration & Convexity • Statistical arbitrage via VECMs • instrument and portfolio Monte Carlo VAR path simulations • credit risk and market risk management • Online adversarial agent Optimization • CUSUM Filter for Regime Change • Feature Engineering

Further Employment Experience

CONSULTANT QUANTITATIVE ANALYST PORTFOLIO ECONOMICS

2004–2017

CLIENTS: A wide range of South African and international banks, insurers, reinsurers, asset management companies and hedge funds

SAMPLE PROJECTS:

Active Portfolio Management – Primarily Hedge Funds

- Developed hypotheses of market inefficiencies, rendered refined models as mathematical expressions and computer code. Worked across all asset classes. Global Macro Asset Allocation and security level signal generation. Incorporated ideas from a wide range of disciplines from physics, engineering, macroeconomics and artificial intelligence.
- Implemented optimal static horizon and path dependent bet/portfolio optimization.

Risk Management - FRTB analysis – market exposure/counterparty risks and capital allocation (B III).

Credit Risk Analysis - Credit risk modelling: PD, LGD, EAD, CVA.

Asset-Liability Modelling

- Provided model to Old Mutual Balance Sheet asset management team with parametric multivariate simulated multi-asset price paths methodologies.
- Implemented Libor Market Model for Insurance company balance sheet management.

Trading System Software Architecture and Implementation

- Conceptualized and coded system for Investec's bond options market making team.
- Programmed software for pricing and monitoring exposures for a comprehensive range of derivative instruments across all asset classes for several clients.

CHIEF INVESTMENT OFFICER

PEREGRINEQUANT ASSET MANAGEMENT (NOW VUNANI)

2000 – 2004

- Asset Allocation Strategy model building, review and portfolio management.
- Development of risk profiled benchmarks – Strategic Asset Allocation.
- Management and training of junior staff

SENIOR QUANTITATIVE ANALYST – ASSET ALLOCATION TEAM

OLD MUTUAL ASSET MANAGERS

1995– 2000

- Conceptualised and programmed quantitative asset allocation process: Producing ongoing optimized multi-asset model portfolios for monthly strategy/model portfolio team review.

PROPRIETARY DERIVATIVES TRADER

JOHANNESBURG CONSOLIDATED INVESTMENTS

1990– 1995

- Managed profitable low risk derivatives trading book, identifying cross-asset arbitrage opportunities in metals, FX, equity, hybrid instruments and convertible bond markets.
- Prepared simulations demonstrating the effects of FX and gold price hedging on cash flows of gold mines, leading to the largest hedging program by a SA gold mining company.

BOND MARKET ANALYST

FRANKEL KRUGER VINDERINE

1988– 1990

- Produced ongoing sell-side research on domestic bond market (Top Ranked for two years Analyst in FM Survey)

ECONOMIST

GOLD FIELDS

1987– 1988

UNIVERSITY EDUCATION		
INSTITUTION	DEGREE	YEAR
Carnegie Mellon University	MSc. Computational Finance: 12-month Course work completed and passed with distinction.	1994
University of Natal	BCom. Honours Graduated Cum Laude Modules: Macroeconomics Optimisation, Econometrics	1986
University of Natal	B.Com. (ECON C) Majors: Mathematics, Statistics Economics.	1983-1985

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