Varun Kannan

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Summary

Theoretical physicist and quantitative researcher with varied experience in research and development. Focus on creating profitable and scalable portfolios with the use of technical tools from theoretical physics, including mathematical modeling of various asset classes in differing market regimes. Enthusiastic about the intersection of theoretical physics and quantitative finance as a foundation for both fundamental research and real-world applications.

Education

2018-09 - 2022-06: Bachelor of Science: Physics, Minor in Mathematics
University of California - San Diego - La Jolla, CA
GPA: 3.32 | 3.60 Major Honors: Provost Honors (5 terms), Salutatorian (HS)

Technical Skills

Programming Languages: Python, Java, Mathematica, C#, JavaScript
Programming related frameworks: Pandas, NumPy, Matplotlib/Plotly, VectorBt, OOP, Multiprocessing
Programming related platforms: Linux, WSL, PowerShell, Jupyter Lab, PyCharm, Android Studio

Projects

Quantitative Trading Model

Skills: Python, NumPy, Plotly, VectorBt, Pandas, Multiprocessing, JSON/Parquet

- Designing Trading Strategies which outperform SPY on low/medium frequency timescales having metrics of Sharpe Ratio > 2, Beta ≈ 0, and Alpha > 1.5.
- Implemented in Python with the use of vectorized operations. Focus on efficient data extraction, accurate analysis, and storage.
- Use of roll forward analysis across multiple timeframes and differing regimes.
- Various methods have been tested including PCA, cointegration, and statistical arbitrage.
- The process is being documented on my personal website: https://qqspinor.com/projects/coding/alp_gen

Technical Experience

Quantum Physics Research

Internship (Paid): 06/2021 - 09/2021 UCSD Physics Department, La Jolla, CA
Dr. Daniel Green, Associate Professor at UCSD

- Identified issues in existing models of quantum fields and tested proposed models on existing data with rigorous analysis tools and a comprehensive research process. Use of Bayesian filters to estimate hidden variables in the context of quantum phenomena, such as decoherence.
- Analyzed research data from various technical sources using Mathematica to create representative graphs and summaries highlighting key insights.

Honors Research: 09/2021 - 12/2021

- Continued the previous internship as an official research subproject with the goal of aiding Dr. Green in his research and learning under his mentorship

Independent Study/Research 03/2021 - 12/2021 UCSD Physics Department, La Jolla, CA

Dr. George Fuller, Distinguished Professor, Former Director of the Center for Astrophysics and Space Science, UCSD

- A mentorship and research on various topics in the field of General Relativity, including the formulation of alternate descriptions of gravity as a geometrical theory. Obtained testable predictions and attempted to compare to existing data.

Publications and Technical Writing

- Authored a paper based on individual study along with a review from a distinguished professor on the application of the geometric interpretation of gauge theories to formulating models in quantum gravity
- Created the website, https://www.qqspinor.com, where I post technical writing, short review articles, derivations, and related exploratory topics in theoretical physics and quantitative finance.

References

References available upon request