Resume

Varun Kannan
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Summary

Theoretical physicist with extensive research experience focused on the theoretical underpinnings of quantum gravity. Passionate about quantitative finance and mathematical modeling with a focus in algorithmic trading. Enthusiastic about the intersection of theoretical physics, mathematics, and computation 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 | 3.53 Upper Division | 3.60 Major | 3.8 Upper Division Major
Honors: Provost Honors (5 terms), Salutatorian (HS)

Technical Skills

- Programming Languages: **Python**, **Java**, **C#**, **Dart**, **Mathematica**
- Programming related frameworks: Pandas, NumPy, Matplotlib, Flutter, Unity, Jupyter Lab
- Programming related platforms: Linux, WSL, JetBrains Ryder, Android Studio

Projects

- Quantitative Trading Model
  Skills: Python, NumPy, JSON, Matplotlib, Pandas, Jupyter Lab
  Designed trading strategies, including mean reversion, momentum trending, and PCA, based on data analysis of various types of stock data. Implemented data extraction, signal generation, and data modeling to create metrics which track performance of various strategies, such as Sharpe Ratio, beta, and alpha.
- Calculator App Development
  Skills: Flutter, Dart, Android Studio
  Developed an interactive calculator app capable of doing simple mathematical calculations. Has cross-platform capabilities and is being expanded to support calculus operations. Preparing for Android release.
- Open World Game Prototype
  Skills: Unity, C#
  Designed a single-player open-world demo with basic player movement

abilities. Being expanded to include robust player-environment capabilities and VR based UI. Part of a larger virtual simulation developing framework.

- Java Projects and Data Structures Course
  Skills: Java
  Completed advanced data structures course using Java, offered online by UCSD. Applied concepts such as search trees and efficient sorting algorithms in various small-scale projects.

- Mathematical Simulation Projects
  Skills: Mathematica
  Designed various visual models of physical systems such as the heat equation and quantum harmonic oscillator under the supervision of Dr. Daniel Green

Technical Experience

Quantum Physics Research

Intern (Paid): 06/2021 - 09/2021
Honors Research: 09/2021 - 12/2021
UCSD Physics Department , La Jolla, CA
Dr. Daniel Green, Associate Professor

- Assisted Professor Green in his research on quantum fluctuations in the early universe

- Gathered and summarized research data from various online technical sources using Mathematica to create representative graphs and summaries highlighting key insights.

- Identified issues in existing models of the theory, analyzed related information and provided solutions to problems by proposing alternate models

Publications and Technical Writing

- Authored a paper based on individual study along with a review from a distinguished professor on the geometric interpretation of gauge theories and their applications in the formulation of theoretical models in quantum gravity

- Authored a review paper of the singularity theorems and their rigorous definition from a mathematical point of view

- Created the website, www.qgspinor.com, where I post technical writing, short review articles, derivations, and related exploratory topics in theoretical physics and mathematics.

Awards

- Provost Honors: 5 terms

References

References available upon request