Quantitative Finance & Data Science

Research Statement: Quantitative Finance & Trading Analytics

My quantitative finance work applies statistical learning, stochastic calculus, and time■series modeling to financial markets, portfolio construction, and systematic trading strategies. I leverage mathematical modeling combined with empirical market data to create robust forecasting and risk■assessment tools.

Core areas of contribution include:

• Volatility and time■series modeling (ARIMA, SARIMAX, GARCH).

• Pricing and hedging of derivatives using Black–Scholes, Monte Carlo simulation, and PDE methods.

• Algorithmic trading systems driven by statistical signals and ML■based feature extraction.

• Portfolio optimization, multi■factor modeling, VaR, and stress testing.

• Market■microstructure analysis to improve liquidity modeling and execution quality.

My research vision is to integrate mathematically principled models with advanced machine■learning systems to improve risk forecasting, trading execution, and financial decision■making.