DHANUSH RAJ

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EDUCATION

Expected 12/25	**NEW YORK UNIVERSITY**	New York, NY

The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- *Expected Coursework:* Monte Carlo methods, stochastic calculus, Black-Scholes, time series analysis, natural language processing, derivative hedging, Fama-French, Hull-White, algorithmic trading, risk management, portfolio management, applied statistics

10/21 - 07/24	**THE UNIVERSITY OF WARWICK**	Coventry, UK

Department of Statistics
B.Sc. in Data Science
- *Coursework:* Bayesian statistics, machine learning, regression, gradient boosting, data analytics, data structures, stochastic calculus, mathematical finance, modern portfolio theory
- *Honors/Awards:* First-class honors

EXPERIENCE

10/23 - 03/24	**THE UNIVERSITY OF WARWICK**	Coventry, UK

Part-Time Research Intern (Python)
- Derived computationally tractable reformulations for Distributionally Robust Optimization, enhancing implementability and runtime efficiency
- Evaluated portfolio optimization experiments benchmarked against S&P 500 index, achieving similar volatility levels and 0.31 increase in Sharpe ratio
- Formulated closed-form solutions using Lagrange duality and inverse covariance estimations
- Developed tractable semi-definite quadratic program using Schur's complement
- Researched closed-form risk measures; derived one based on exponential disutility
- Co-authored paper submitted to 2024 European Conference on AI; delivered presentations

07/23 - 09/23	**WMG**	Coventry, UK

(Industrial research group at Warwick University)
Research Intern (Python, Java)
- Implemented Isolation Forest and K-means on feature subsets to identify critical scenarios
- Engineered rule-based mutations and GANs to increase database diversity by 29%
- Addressed gaps in data using K-Nearest Neighbors and regression imputation
- Co-authored paper on query-time mutation for IEEE Conference on Robotics and Automation
- Presented research findings and progress updates to senior management and team members

PROJECT

06/24 - Present	**THE UNIVERSITY OF WARWICK**	Coventry, UK

Options Pricing: Deep Learning, Gradient Boosting, and Robust Approaches (Python)
- Developed machine learning models for options pricing on major tech stocks, achieving reduction in prediction errors compared to Black-Scholes
- Deployed CNN-LSTM model using TensorFlow to extract features from historical stock and options prices, avoiding traditional reliance on volatility and Greeks
- Train XGBoost model to improve interpretability and robustness, addressing overfitting risks
- Research ambiguity aversion in options pricing by minimizing worst-case replicating errors between replicating portfolio and option payoff

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python (10+ years), R, SQL, Java, MATLAB, LaTex
Certifications: Bloomberg Finance Fundamentals Certificate; IBM Deep Learning Professional Certificate (edX)
Activities: Warwick Kabaddi Club Captain (Scaled Club by 300%); BBC British Kabaddi League (Semi-Professional)