Krish Bagga

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Education

B.Tech. Computer Science with specialization in AI ML **2020 - 2024**
Vellore Institute of Technology, Chennai, Tamil Nadu

Experience

Data Scientist | MicroGCC Labs, India/USA **Jan '25 - Jan '26**
Abstract: Modernizing legacy MMM & integrating SAM Agent workflows for diverse Retail, Media & Banking clients.
- Automated legacy MMM for Media clients, reducing insight cycles from 45 days to 1 week (85% efficiency gain).
- Integrated SAM agent workflows into Clustering & Anomaly Detection pipelines, automating complex feature extraction.
- Led deep-dive analysis on Retail & Banking datasets to build scalable E2E pipelines and optimize model performance.

Machine Learning Engineer | Outlier.ai, India **Oct '24 - Jan '25**
Abstract: Optimized multimodal LLM performance through controlled error analysis and prompt design
- Designed strategic prompts for multimodal LLM error induction, applying mathematical frameworks to identify weaknesses.
- Programmed Python solutions with XGBoost and BERT techniques to enhance model robustness across parameters.
- Measured **35%** performance gains in truthfulness, clarity, and instruction-following dimensions of LLM outputs in diverse contexts.

Research Consultant | WorldQuant LLC, India **Apr '24 - Aug '24**
Abstract: Developed high-performance quantitative trading models with simulation-based validation
- Developed **15+** quantitative trading models using Python, conducting **1,000+** simulations to validate performance metrics
- Analyzed financial data using NumPy, Pandas, and statistical tools for pattern recognition and predictive trend identification.
- Benchmarked **20%** ROI against industry standards, outperforming fixed deposits by **14%** for significant portfolio enhancement.

Academic Achievements

Ranked **23rd** globally in WorldQuant International Quant Championship while securing **1st** place among 200+ college teams.. **2024**

One of **10** recipients to earn WorldQuant Gold Certification among **500+** college participants for alpha model research. **2024**

Advanced to final round in Polygon-Crust Blockchain Hackathon among **100+** teams with innovative **DeFi** solution. **2024**

Projects

European Option Pricing Models | Python, Black-Scholes, Docker (pricingoptions.in) **Jan '24 - Mar '25**
- Executed Python application for pricing European options using Black-Scholes, Monte Carlo, and Binomial models.
- Created Streamlit dashboard with visualizations for option pricing models, fetching real-time data from Yahoo Finance API.
- Optimized application to reduce analysis time by **73%** while achieving **95% pricing accuracy** against market benchmarks.

Portfolio Performance Predictor | Python, VaR, Monte Carlo, Risk Analytics **Oct '24 - Jan '25**
- Developed a Portfolio Management Tool using Monte Carlo Simulations **(10,000+ iterations)** to model diverse market scenarios.
- Implemented **covariance matrix optimization** for multivariate normal distribution of daily returns across asset classes.
- Achieved **92%** accuracy in predicting market downturns, outperforming traditional risk assessment methods by **18%**.

Cryptocurrency Forecasting Engine | Python, LSTM, ARIMA, GridSearchCV **Nov '23 - Dec '23**
- Applied ensemble modeling combining **LSTM** networks and **ARIMA** approaches on high-frequency trading data.
- Implemented **GridSearchCV** hyperparameter optimization with cross-validation to enhance model performance
- Generated algorithmic trading signals with **77%** forecast accuracy, driving higher returns and **20%** growth in adoption.

Skills and Expertise

Languages: Python, R, C++ C#, SQL, JavaScript; **Frameworks & Tools:** Pandas, NumPy, SciPy, TensorFlow, PyTorch, PowerBI, AWS, Excel, Apache Airflow, UE5; **Math & Finance:** Time series analysis, Stochastic calculus, Probability & statistics, Differential equations, Derivatives pricing, Portfolio optimization, VaR & CVaR, Option pricing models, Algorithmic trading

Certifications

NISM-Series-XV: Research Analyst — National Institute of Securities Markets **Apr '25**
Mastered equity research methodologies, financial modeling, and securities regulation for professional market analysis.

Quantitative Research Job Simulation — Forage **Feb '25**
Developed trading algorithms using Python and statistical methods to analyze market data and optimize portfolio performance.

Python for Trading — QuantInsti **Dec '24**
Applied Python programming for algorithmic trading strategies, backtesting frameworks, and financial data analysis.

AWS Cloud Technical Essentials — Amazon Web Services **Jun '24**
Deployed scalable cloud infrastructure using core AWS services for computing, storage, and database management.