**Rishab Tirupathi**

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**Education**

**University of Illinois at Urbana-Champaign**  *Expected December 2025*

*Master of Science in Applied Mathematics, Algorithms and Optimization Overall GPA: 3.79/4.00*

**Graduate Coursework:** Statistical Learning, Stochastic Processes, Computational Statistical Optimization, Algorithms, Probability, Advanced Optimization, Graph Theory, Combinatorial Mathematics, Partial Differential Equations

**University of Illinois at Urbana-Champaign**  *December 2023*

*Bachelor of Science in (Highest Distinction) Applied Mathematics, (Highest Distinction) Statistics Overall GPA: 3.81/4.00* Dean’s List, Men’s Rugby, Psi Eta Mu Information Sciences Professional Fraternity

**Undergraduate Coursework:** Linear Algebra, Probability, Statistical Modelling, Time Series Analysis, Machine Learning, Numerical Methods, Stochastic Processes, Optimization, Applied Random Processes, Algorithms and Computing, Statistical Analysis, Combinatorics

**Experience**

**Freddie Mac McLean, VA**

*Graduate Quantitative Risk Management Intern, Single Family Costing Team May 2025 – August 2025*

* Analyzed over 1 million loans through SQL queries and SAS to determine discrepancies and anomalies in data
* Debugged a default risk model, performed data extraction and created visualizations to support analysis and performance evaluation
* Constructed an optimization solver to reduce time to determine loan weights by 97%
* Collaborated with team members to manage priorities and meet deadlines, ensuring timely progress on tasks

**University of Illinois at Urbana-Champaign Champaign, IL**

*Graduate Researcher August 2024 – Present*

* Conducting research in reinforcement learning applying control theory and stochastic processes to model dynamics
* Reading and reviewing peer-reviewed papers to identify gaps and recent developments in the field
* Participating in a reading group on Reinforcement Learning, engaging in discussions and presenting advancements and applications

*Mathematics Graduate Teaching Assistant August 2024 – Present*

* Assisting in teaching Calculus to over 60 undergraduate students, enhancing their fundamentals and computational procedures
* Conducting weekly discussion sessions, clarifying complex concepts and facilitating problem-solving activities
* Grading assignments and exams biweekly providing constructive feedback to improve student performance
* Holding weekly office hours to offer individualized academic support and mentorship

**AGCO Corporation Champaign, IL**

*Data Analyst Intern**May 2024 – August 2024*

* Automated manual code generation and data cleansing processing through VBA reducing reporting time by 98%
* Implemented automated code generating processes uniquely mapping over 3500 entries to alphanumeric codes
* Conducted research on product inventory to determine redundant information and refine product offerings

**FrostDefense Envirotech Champaign, IL**

*Machine Learning Intern**January 2024 – May 2024*

* Performed data visualization and statistical analysis on temperature data of over 35,000 data points from 1924 to 2023, focusing on frost risk assessment and trend identification through Python
* Implemented machine learning and deep learning algorithms such as Random Forest and LSTM, to forecast temperature patterns and frost occurrence through time series data with 94% accuracy
* Developed an automation process in Python of downloading and aggregating data from multiple CSV files into a single dataset

**Chicago Blackhawks Chicago, IL**

*Analytics Intern, Business Strategy and Analytics Group June 2023 - August 2023*

* Implemented and designed SQL and DBT data models of over 1 million ticketing records to support operation analyses and reporting
* Developed 4 Tableau dashboards for the ticketing department to make data-driven decisions on ticket pricing and sales
* Formulated hypotheses, performed tests, synthesized insights, and effectively delivered recommendations through narratives and presentations to senior leadership

**Projects**

**World Health Organization Life Expectancy Predictor**

* Developed classification and regression models on a World Health Organization dataset to predict Life Expectancy, focusing on Logistic Regression and Random Forest in Python and R
* Conducted correlation analysis to identify key variables, achieving a classification accuracy of 94.4%
* Improved model performance by trimming predictors, scaling inputs, and utilizing Random Forest models, resulting 98.3% accuracy

**Skills**

Programming Languages: Git, Python, R, SAS, SQL, Visual Basic

Software: DBT, Microsoft Excel, Snowflake, Tableau (BI)

Python Libraries: Keras, Matplotlib, NumPy, pandas, scikit-learn, SciPy, seaborn, statsmodels, TensorFlow

R Libraries: dplyr, ggplot2, tidyverse, tsa