

# RISHAB TIRUPATHI

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## Education

### University of Illinois at Urbana-Champaign

December 2025

*Master of Science in Applied Mathematics, Algorithms and Optimization*

Overall GPA: 3.84/4.00

**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

**Undergraduate Coursework:** Linear Algebra, Probability, Statistical Modelling, Time Series Analysis, Machine Learning, Numerical Methods, Stochastic Processes, Optimization

## 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 – December 2025

- 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