

# Jianyang Zhou

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## EDUCATION

### Duke University | Durham, NC

05/2025(Expected)

- M.S in Electrical and Computer Engineering
- Advisor: Javier Pastorino

### Cornell University, College of Engineering | Ithaca, NY

12/2022

- B.S in Operations Research Information Engineering  
GPA: 3.53/4.00
- Advisor: James Renegar
- Core Course: Data Structure and Algorithms, Machine Learning, Statistical Data Mining, Optimization, Simulation Model and Analysis, Probability and Statistics, Stochastic Process, Supply Chain Analysis

## RESEARCH INTERESTS

Air Transportation Systems, Airline Operations, Data Science in Transportation, Simulation, Machine Learning

## RESEARCH EXPERIENCE

### Duke University | Durham, NC

08/2024 – Present

*Research Assistant*

*Advisor: Prof. Javier Pastorino*

- Built models in Python to investigate flight delays and cancellations in the U.S
- Explored the impact of different factors on flight delays, including weather, airports, airlines, time, etc.
- Used machine learning techniques to predict delay time

### MIT JTL-Transit Lab | Cambridge, MA

05/2024 - 09/2024

*Summer Research Assistant*

*Advisor: Prof. Jinhua Zhao, Prof. Haris Koutsopoulos*

- Developed a delay propagation model for public transportation systems by simulation in Python
- Compared the impact of different factors such as scheduled run time, minimum dwell time, and coefficient of variation on delay time, delay propagation, and vehicle utilization rate
- Simulated out the optimal timetable under different target on-time rates that maximize the vehicle utilization rate; found out the critical point where delayed propagation occurs

### Cornell University | Ithaca, NY

06/2022 - 12/2022

*Undergraduate Research Assistant*

*Advisor: Prof. David Goldberg*

- Developed a predictive model for time-based traffic accidents to help the Tompkins County Sheriff's Office allocate resources effectively across multiple locations
- Applied K-means clustering to group accident data by time and used Power BI for data visualization, determining high-probability accident time ranges and assigning priority levels
- Generated a patrol officer schedule based on accident probability and priority, leading to an 18% reduction in accidents, and the model was adopted by the Sheriff's Office

## INTERNSHIP EXPERIENCE

### Norfolk Southern | Atlanta, GA

01/2023 - 05/2023

*Operations Research Intern*

- Extracted and cleaned data of cargo shipment in IBM DB2 database, built automated report scripts of cargo volume's trend for 50 terminal yards by Python, SQL, and Spotfire
- Compared predicted cargo flow with actual, improving the predicting model by adding holiday effects

- Analyzed the cargo arrival time from customers on an hourly basis, considered multiple factors' impact, including origin, destination, shipment type, etc., and used the random forest to classify the time pattern

## TEACHING EXPERIENCE

**ECE590 Programming and DS for ML (Graduate Level) | Duke University**

**08/2024 – Present**

*Teaching Assistant*

- Leading discussions, grading homework and exams, holding office hours
- Implementing test scripts for programming homework

## PUBLICATION

Zhou, J., Javier, P. (2024). "Domestic Flight Delays Prediction Using Machine Learning." (Manuscript in preparation).

Zhou, J., John T.M., Haris, K. (2024). "Delay Propagation Analysis and Optimization Towards Utilization Rate in Public Transportation." (Manuscript in preparation).

## PROJECTS

**NY State Helicopter Emergency Transportation System**

**09/2021 - 12/2021**

- Led a five-student team to model and implement a New York State helicopter rescue system
- Analyzed historical data, and performed thinning method simulation to generate random data
- Developed an algorithm using a heuristic method to compute the optimal location arrangement for 5 to 12 helicopters. Optimized the average response time to 0.42 hours, and the available rate at 79.5%

**COVID-19 Prediction from Symptoms**

**03/2021 - 05/2021**

- Performed statistical analysis model to forecast the probability of positive cases by given symptoms
- Implemented logistics regression and K-Nearest neighbors and decision trees to achieve an accuracy of around 80% and an FNR of around 95% after hyperparameter tuning using K-Fold cross-validation
- Identified 3 highly important features and made 5 data-driven recommendations to help local government better control COVID cases based on feature importance analysis

## HONORS AND AWARDS

**Cornell Dean's List**

**2022**

**UCSC Dean's List**

**2018, 2019, 2020**

**Euclid Mathematics Contest Distinction**

**2018**

## SKILLS

Programming Languages: Python, Java, C, C++, R, HTML, CSS, JavaScript

Tools: Gurobi, SQL, Unix, Git, Tableau, Eclipse, XCode, Visual Studio Code, LaTeX, DB2, Teradata

## OTHERS INTERESTS

Beyond academia, I am very interested in exploring the airlines and railway systems worldwide. For airlines, I like to research their fleet, route, and frequent flyer program. For the railway systems, I like to research their service pattern, rolling stock, and connectivity. I also like to photograph them. So far, I have visited more than ten countries to experience their railways and airlines.