

## EDUCATION

### Georgia Institute of Technology

*Expected Dec. 2022*

- Bachelor of Science, Industrial Engineering, Concentration in Analytics and Data Science
- Minor in Scientific and Engineering Computing **GPA: 3.93/4.00**
- GRE (*August 2021*): Quantitative – 169 | Verbal – 162 | Analytical Writing – 4.5

## RESEARCH INTEREST

Computational optimization and machine learning to innovate transportation systems with the goal to make more intelligent and operationally efficient mobility, transit, and freight systems

## RESEARCH

### Undergraduate Research Assistant

Georgia Institute of Technology

### Socially Aware Mobility Lab (<https://sam.isye.gatech.edu>)

Supervisor: Dr. Pascal Van Hentenryck

### *Dedicated Bus Lanes (DBLs) in On-Demand Multimodal Transit Systems (ODMTS) Feb. 2021-Present*

- Conducted congestion analysis through Google Maps and GDOT traffic volume data to obtain an overview of congestion and potential time savings of DBLs along I-85 in the Metro Atlanta area
- Developed methods to incorporate congestion and DBLs into ODMTS modeling
- Used Google Maps Platform, OSMGraphhopper, and Polaris to create various congestion scenarios on ODMTS systems
- Tested ODMTS in a case study on Metro Atlanta area using ridership data
- Analyzed the ODMTS design without and with DBLs to measure impact on different congestion levels in terms of travel times, adoption, and transit system costs

### *Bus Line Optimization Modeling in ODMTS*

*May 2022-Present*

- Developed a formulation to evaluate rider paths and associated costs through the ODMTS on individual bus lines across transit routes
- Created transit data on the current system and tested formulation on current system ridership to assess passenger choices

### *Metropolitan Atlanta Rapid Transit Authority (MARTA) Reach Analysis*

*Oct. 2022-Present*

- Simulating MARTA Reach Pilot and ridership data on varying fleet sizes and assessing impact
- Investigating the usage of autonomous vehicles on the MARTA Reach Pilot and assessing impact

## WORKING PAPERS

“Impacts of Dedicated Bus Lanes and Congestion on On-Demand Multimodal Transit Systems”

## PROJECTS

### Senior Design Capstone Project: Convoy Shipment Process Improvement

*Spring 2022*

- Undertook root cause analysis of conflicting appointment time (CAT) errors from Convoy’s internal processes, leading to recommendations on improvements to load confirmation updates, additional data to collect, and changes to UI used by operators
- Created a machine learning model in Python and SQL and a standard operating procedure that prevents CATs in future shipments
- Saved Convoy over \$1 million annually, 4.3 hours/shipment, and 190000 miles/year
- Team selected as Senior Design Capstone Finalist: top 3 teams out of 28 total undergraduate ISYE senior design teams

### Investigating the Effectiveness of Ramp Metering on Traffic Flow in Complex Traffic Systems

*Spring 2021*

- Designed a discrete-based simulation in Python to evaluate ramp metering on I-75/I-285 interchange through two different ramp metering strategies: ALINEA and a modified ALINEA
- Undertook empirical evaluation to assess effectiveness of ramp metering policies in a case study

#### **Machine Learning for Wildfire Susceptibility Mapping**

*Spring 2021*

- Collected and cleaned data to predict wildfire levels across the U.S. for the year 2020
- Implemented unsupervised and supervised machine learning techniques in Python to reduce dimensions of dataset and then train and predict wildfire levels

#### **Minimum Vertex Cover (MVC) Problem**

*Fall 2020*

- Designed four different algorithms (branch and bound, approximation, stochastic local search, simulated annealing local search), each to solve the MVC problem
- Tested algorithms coded in Python on datasets from the 10<sup>th</sup> DIMACS challenge and undertook empirical evaluation to assess effectiveness of each algorithm

### **INDUSTRY**

#### **Industrial Engineering Co-op, Yokogawa**

*May 2021-Dec. 2021*

- Automated recording and display processes from 100 engineering data files, eliminating errors in manual reporting and saving 300 hours annually
- Created a sheet to generate automated product numbers, saving 200 hours annually and eliminating manual reporting
- Improved an existing UI to include additional products and lines, saving an additional 300 hours annually and preventing errors arising during audit

#### **Industrial Engineering Co-op, Yokogawa**

*May 2020-Jul. 2020*

- Created a UI software application in VB and SQL that transformed manufacturing line boards to a digital format with live display, moving the company to a paperless model
- UI saves 1500 hours annually, eliminates fines for insufficient displays, and was selected for Yokogawa's Global Manufacturing Engineering Competition

### **TEACHING**

#### **Undergraduate Teaching Assistant, Georgia Institute of Technology**

Simulation Analysis and Design – Instructor: Dr. Seong-Hee Kim

*Summer 2022*

Decision and Data Analytics – Instructor: Dr. Jye-Chyi Lu

*Spring 2022*

Statistics and Applications – Instructor: Dr. Tuba Ketenci

*Spring 2021*

- Advised three semester-project teams by guiding model formulations, monitoring progress, giving recommendations, and reviewing deliverables
- Taught students R, Simio, ExpertFit, and Python Modules from SciPy
- Graded homework, labs, and midterm/final projects
- Held open and individual office hours and answered student questions

#### **Head Teaching Assistant, The Seth Bonder Camp**

*Summer 2022*

<https://sethbondercamp.isye.gatech.edu>

- Led two week-long camps for high school students 9 AM – 5 PM daily, organizing logistics, guiding interactive activities, and managing other teaching assistants
- Taught students computer and data science principles through Snap!

### **SKILLS**

**Programming:** Python, C, SQL, R, LaTeX, Java, OPL, MATLAB, HTML/CSS

**Packages:** Numpy, Pandas, Matplotlib, SciPy, Networkx, Folium, Shapely

**Commercial Solvers:** Gurobi, CPLEX

**Software:** Jupyter Notebook, HTCondor, PBS, Visual Studio, Simio, Minitab, Microsoft Office

**Operating Systems:** Linux, Windows, MacOS