

Muting (Don) Ma, Ph.D.

✉ muting.ma@outlook.com [in linkedin.com/in/mutingma](https://www.linkedin.com/in/mutingma) github.com/mutingma123
🏛️ [Operations Management Ph.D. Program - University of Alabama](#)

Last Updated: January 1st, 2026

Optimization/Operations Modeler · Strategic Manager · Policy Analyst

Operations researcher with dual Ph.D. training, **8+** years of international experience, and **\$500K+** in funded research, specializing in optimization, game theory, and market dynamics modeling to solve **complex decision problems in technology transitions and sustainable operations**.

Education & Academic Training

- 2025–Present** **Ph.D. in Operations Management** (In Progress), University of Alabama (UA)
Department: Information Systems, Statistics, and Management Science, Culverhouse College of Business
Research Focus: Competitive dynamics modeling, Market equilibrium analysis
Award: 2nd Place, Culverhouse Data Analytics Summit Poster Competition (2025)
- 2017–2022** **Ph.D. in Civil Engineering**, University of Louisville (UofL)
Department: Civil and Environmental Engineering
Dissertation: Optimal scheduling of connected and autonomous vehicles at reservation-based intersections
Awards: Grosscurth Fellowship (2017), Doctoral Dissertation Completion Award (2022)

Theoretical Foundations & Coursework

- Optimization Theory** Linear Programming (OM 600, UA), Stochastic Decision Models (OM 601, UA), Integer Modeling and Optimization (OM 603, UA), Foundation of Optimization I (IE 610, UofL), Inventory Management (OM 523, UA)
- Statistical Methods** Mathematical Statistics I (ST 554, UA), Special Topics in Analytics (ST 597, UA), Predictive Modeling with Business Applications (BAN 501, UA)
- Game Theory** Game Theory (EC 660, UA)
- Computational Methods** Data Mining (CECS 632, UofL), Transportation Engineering (CEE 560, UofL)
- Teaching Experience** Graduate Teaching Assistant for OM 310, UA - Introduction to Management Science

Research Experience & Strategic Applications

- 2025–Present** **Graduate Teaching Assistant**, University of Alabama
Ph.D. Operations Management Program
 - Developing **primal-dual optimization frameworks** for manufacturer coopetition strategies
 - Analyzing **Nash equilibrium conditions** in electric vehicle market transitions
 - Quantifying trade-offs between short-term profitability and long-term sustainability
- 2022–2025** **Postdoctoral Research Associate**, University of Alabama
Employer: Institute of Data & Analytics, Culverhouse College of Business
Main Research: Feature selection algorithms, Bi-objective optimization, Large-scale simulation
Alabama Mobility and Power Center – \$287,751 Grant
 - Developed C2SLM framework achieving **20.1% improvement** in market forecasting accuracy
 - Designed **system dynamics model** predicting EV adoption trends for Alabama market
 - Built decision support systems for electric vehicle adoption prediction
 - Delivered insights to public agencies, automotive industry, and academic institutions
 - Led research team of 8+ members across multiple disciplines
 - Mentored undergraduate, master's, and doctoral students
- 2017–2022** **Graduate Research Assistant**, University of Louisville

NSF Industry-University Cooperative Research Centers – \$45,990 Grant

- Designed next-generation signal-free interchange control for connected vehicles
- Created traffic intersection optimization models handling **14,400 vehicles/hour** traffic capacity
- Achieved **5% delay reduction** at 1800 vehicles/hour/lane throughput
- Reduced average vehicle delays to **1.8-2.3 seconds** under extreme traffic demands

2019–2021

Graduate Research Assistant, University of Louisville

NCHRP IDEA Project 217 – \$137,000 Grant

- Developed real-time proactive intersection safety monitoring systems
- Deployed radar-based system adopted by transportation agencies nationwide

KYTC Highway Safety Improvement Program – \$39,318 Grant

- Designed safety countermeasures and visualization systems for Louisville (KY, USA) intersections

Quantified Research Impact

Funding & Leadership

- **\$509,059** total grants secured
- **\$287,751** largest single grant
- **8+** team members led

Lead researcher on 4 competitive federal/state grants
EV market analysis for Alabama Transportation Institute
Cross-functional research teams across disciplines

Technical Performance

- **20.1%** forecasting improvement
- **14,400** vehicles/hour capacity
- **98.5%** delay reduction
- **249%** throughput increase
- **92%** higher average speed

C2SLM model vs. industry benchmarks for EV demand
Handled **4×** higher demand than typical benchmarks (vs. 2,600–4,200 veh/h)
1.8–2.3s average delay vs. 140–169s baseline at extreme demand
Speed-maximization optimization vs. max-throughput baseline methods
Proposed trajectory model vs. alternative optimization objectives

Technical Competencies

Programming	C++, C#, Python, Java, SQL
Optimization Tools	Gurobi, CPLEX, Visual Studio
Statistical Software	R, Tableau
Systems	Linux
Methods	Linear/Integer Programming, Dynamic Programming, Game Theory, Stochastic Modeling

Publications & Research Contributions

2026+	Ma, M. “Sustainable Life Management (SLM): Multi-Period Capital Allocation Under Uncertainty.” DOI: 10.5281/zenodo.18039750
2026+	Ma, M., Yavuz, M. “Socioeconomic Trade-offs in Connected Vehicle Markets: A Primal-Dual Framework.” SSRN: 5372729
2026	Ma, M., Li, Z., & Yavuz, M. “Connected and Automated Vehicles Scheduling at a Reservation-based Intersection using Dynamic Programming with Dominance Pruning.” <i>International Transactions in Operational Research</i> . DOI: 10.2139/ssrn.4097173
2025	Ma, M., Yavuz, M., et al. “C2SLM: A Correlation-based Clustering-assisted Sparse Learning Model for Electric Vehicle Market Demand Forecasting.” <i>Pattern Recognition</i> , 170, p.111984. DOI: 10.1016/j.patcog.2025.111984
2023	Ma, M. & Li, Z. “A speed-maximization trajectory optimization model on a reservation based intersection control system.” <i>Transportation Research Part C</i> , 154, p.104266. DOI: 10.1016/j.trc.2023.104266
2022	Li, Z. & Ma, M. “A Real-Time Proactive Intersection Safety Monitoring System Based on Radar Sensor Data.” <i>NCHRP IDEA Project 217</i> (Technical Report). TRB Link
2021	Ma, M. & Li, Z. “A time-independent trajectory optimization approach for connected and autonomous vehicles.” <i>Transportation Research Interdisciplinary Perspectives</i> , 9, p.100312. DOI: 10.1016/j.trip.2021.100312