

# Muting (Don) Ma, Ph.D.

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 Operations Management Ph.D. Program - University of Alabama

*Last Updated: January 30, 2026*

## Operations Research Scholar · Optimization Theorist · Quantitative Methodologist

Operations researcher with dual Ph.D. training and **8+** years of scholarly experience, specializing in **optimization theory, game-theoretic modeling, and market dynamics**. Published in leading journals including *Pattern Recognition* and *Transportation Research Part C*. Lead contributor on **\$500K+** in competitively funded research. Committed to advancing theoretical foundations while mentoring the next generation of scholars.

## Education

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

## Peer-Reviewed Publications

- 2025**     **Ma, M.,** Yavuz, M., et al. “C2SLM: A Correlation-based Clustering-assisted Sparse Learning Model for Electric Vehicle Market Demand Forecasting.” *Pattern Recognition*, 170, p.111984. DOI: [10.1016/j.patcog.2025.111984](https://doi.org/10.1016/j.patcog.2025.111984)
- 2023**     **Ma, M. & Li, Z.** “A speed-maximization trajectory optimization model on a reservation based intersection control system.” *Transportation Research Part C: Emerging Technologies*, 154, p.104266. DOI: [10.1016/j.trc.2023.104266](https://doi.org/10.1016/j.trc.2023.104266)
- 2021**     **Ma, M. & Li, Z.** “A time-independent trajectory optimization approach for connected and autonomous vehicles.” *Transportation Research Interdisciplinary Perspectives*, 9, p.100312. DOI: [10.1016/j.trip.2021.100312](https://doi.org/10.1016/j.trip.2021.100312)

## Working Papers & Papers Under Review

- Under Review**     **Ma, M.,** Li, Z., & Yavuz, M. “Connected and Automated Vehicles Scheduling at a Reservation-based Intersection using Dynamic Programming with Dominance Pruning.” *International Transactions in Operational Research*. SSRN: [4097173](https://ssrn.com/abstract=4097173)
- Under Review**     **Ma, M.,** Li, Z., Hudnall, M., Wang, Q., Yavuz, M., & Dula, J. “Socioeconomic Tradeoff on Connected and Automated Vehicles Scheduling at a Reservation-based Intersection.” *European Journal of Operational Research*. SSRN: [5372729](https://ssrn.com/abstract=5372729)
- Working Paper**     **Ma, M.** “Sustainable Life Management (SLM): Multi-Period Capital Allocation Under Uncertainty.” DOI: [10.5281/zenodo.18039750](https://doi.org/10.5281/zenodo.18039750)

## Technical Reports

2022 Li, Z. & Ma, M. “A Real-Time Proactive Intersection Safety Monitoring System Based on Radar Sensor Data.” *NCHRP IDEA Project 217*. [Transportation Research Board](#)

## Research Experience

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- 2025–Present**     **Doctoral Researcher**, University of Alabama  
*Advisor: Dr. Mesut Yavuz, Department of ISM*
- Developing primal-dual optimization frameworks for analyzing manufacturer competition strategies in technology transitions
  - Investigating Nash equilibrium conditions and welfare implications in electric vehicle market adoption
  - Theoretical contributions: Characterizing trade-offs between firm profitability and societal sustainability objectives
- 2022–2025**     **Postdoctoral Research Associate**, University of Alabama  
*Institute of Data & Analytics, Culverhouse College of Business*  
*Research Areas: Machine learning, bi-objective optimization, large-scale simulation*
- Developed C2SLM framework—novel sparse learning methodology combining correlation-based clustering with feature selection
  - Designed system dynamics models for technology adoption forecasting with theoretical grounding in diffusion theory
  - Led interdisciplinary research team of 8+ members; mentored undergraduate, master’s, and doctoral students
  - Lead researcher role: Alabama Mobility and Power Center (\$287,751)
- 2017–2022**     **Doctoral Researcher**, University of Louisville  
*Advisor: Dr. Zhixia Li, Department of Civil and Environmental Engineering*
- Developed theoretical foundations for optimal vehicle scheduling at signal-free intersections using dynamic programming
  - Formulated novel trajectory optimization models with provable optimality conditions
  - Extended dominance pruning techniques to reduce computational complexity in large-scale scheduling problems
  - NSF I/UCRC funded research (\$45,990)
- 2019–2021**     **Graduate Research Assistant**, University of Louisville  
*NCHRP IDEA Project 217 (\$137,000) & KYTC Highway Safety Improvement Program (\$39,318)*
- Developed real-time proactive safety monitoring systems with methodological contributions in sensor fusion
  - Research outcomes adopted by transportation agencies for practical implementation

## Teaching Experience

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- 2025–Present**     **Graduate Teaching Assistant**, University of Alabama
- OM 310: Introduction to Management Science (Undergraduate)  
*Linear programming, decision analysis, and optimization fundamentals*
  - OM 524: Manufacturing Scheduling & Control Systems (Graduate)  
*Scheduling algorithms, production planning, and control theory*
  - OM 525: Effective Quality Management (Graduate)  
*Statistical quality control, process improvement methodologies*
- 2022–2025**     **Research Mentor**, University of Alabama
- Supervised undergraduate research assistants on data analysis projects
  - Mentored master’s and doctoral students on research methodology and academic writing

## Research Grants & Funding

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- 2022–2025**     **Alabama Mobility and Power Center**, \$287,751  
*Role: Lead Researcher. Electric vehicle market analysis and demand forecasting.*

<b>2019–2022</b>	<b>NCHRP IDEA Project 217, \$137,000</b> <i>Role: Graduate Research Assistant. Real-time intersection safety monitoring systems.</i>
<b>2019–2021</b>	<b>KYTC Highway Safety Improvement Program, \$39,318</b> <i>Role: Graduate Research Assistant. Safety countermeasures design and implementation.</i>
<b>2017–2022</b>	<b>NSF Industry-University Cooperative Research Centers, \$45,990</b> <i>Role: Graduate Research Assistant. Connected vehicle intersection control.</i>
<b>Total Funding: \$509,059</b>	

## Advanced Coursework

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<b>Optimization Theory</b>	Linear Programming (OM 600), Stochastic Decision Models (OM 601), Integer Modeling and Optimization (OM 603), Foundations of Optimization I (IE 610), Inventory Management (OM 523)
<b>Statistical Methods</b>	Mathematical Statistics I (ST 554), Special Topics in Analytics (ST 597), Predictive Modeling (BAN 501), Advanced Mathematical Statistics (ST 697)
<b>Game Theory</b>	Game Theory (EC 660)
<b>Computational Methods</b>	Data Mining (CECS 632), Transportation Engineering (CEE 560)

## Technical Skills

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<b>Programming</b>	C++, C#, Python, Java, SQL
<b>Optimization Solvers</b>	Gurobi, CPLEX
<b>Statistical Software</b>	R, Tableau
<b>Development Tools</b>	Visual Studio, Linux
<b>Methodological Expertise</b>	Linear/Integer Programming, Dynamic Programming, Game Theory, Stochastic Modeling, Machine Learning

## Awards & Honors

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<b>2025</b>	2nd Place, Culverhouse Data Analytics Summit Poster Competition, University of Alabama
<b>2022</b>	Doctoral Dissertation Completion Award, University of Louisville
<b>2017</b>	Grosscurth Fellowship, University of Louisville

## Professional Service & Affiliations

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<b>Representative Journal Reviewer</b>	International Transactions on Operational Research, PLOS One, IEEE Transactions on Intelligent Transportation Systems, Energy Systems
<b>Memberships</b>	INFORMS, Transportation Research Board