

J. Carlos Martínez Mori

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EDUCATION

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| Cornell University PhD in Applied Mathematics Master of Science in Applied Mathematics (<i>awarded with PhD candidacy</i>) Committee: Samitha Samaranyake (chair), David Shmoys, Bobby Kleinberg Areas: Combinatorial Optimization, Approximation Algorithms | Fall 2017 - Present <i>Expected:</i> Spring 2023 Fall 2020 |
| University of Illinois at Urbana-Champaign Bachelor of Science in Civil Engineering Minor in Computer Science <i>Highest Honors at Graduation</i> Advisor: Daniel Work Areas: Infrastructure Systems, Transportation Engineering | Fall 2013 - Spring 2017 GPA: 3.91 |

HONORS

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| Dwight David Eisenhower Transportation Fellowship (FHWA) | 2017, 2018, 2020 |
| Graduate Fellowship (Systems at Cornell) | Fall 2017 |
| Edmund J. James Scholar (at graduation from Illinois) | Spring 2017 |
| Melih T. Dural Undergraduate Research Prize (CEE at Illinois) | Spring 2017 |
| Illinois Association of County Engineers Scholarship Award (CEE at Illinois) | Spring 2016 |
| Summer Student Research Program Grant (ICT/IDOT) | Summer 2015 |
| Grant W. Shaw Memorial Scholarship (CEE at Illinois) | Spring 2015 |
| “Universidades de Excelencia” Scholarship (Govt. of Ecuador) | Fall 2013 - Spring 2017 |

RESEARCH

Papers

1. **J. Carlos Martínez Mori**, Samitha Samaranyake, and M. Grazia Speranza, “On the Value of Dynamism in Transit Networks.” Extended abstract, *11th Triennial Symposium on Transportation Analysis (TRISTAN XI)*, 2022. Full manuscript, in preparation for submission to *Transportation Science*, 2022.
2. **J. Carlos Martínez Mori** and Samitha Samaranyake, “Permutatorial Optimization via the Permutahedron.” *Operations Research Letters*, 50:5, 441-445, 2022.
3. Yasmin Aguilon, Dylan Alvarenga, Pamela E. Harris, Surya Kotapati, **J. Carlos Martínez Mori**, Casandra D. Monroe, Zia Saylor, Camelle Tieu, Dwight Anderson Williams II, “On Parking Functions and the Tower Of Hanoi.” To appear, *American Mathematical Monthly*, 2022.
4. **J. Carlos Martínez Mori** and Samitha Samaranyake, “On the Request-Trip-Vehicle Assignment Problem.” In *Proceedings of the 1st SIAM Conference on Applied and Computational Discrete Algorithms (ACDA21)*, pp. 228-239, 2021.
5. **J. Carlos Martínez Mori** and Samitha Samaranyake, “Bounded Asymmetry in Road Networks.” *Scientific Reports*, 9, 11951, 2019.
6. William Barbour, **J. Carlos Martínez Mori**, Shankara Kuppa, and Daniel Work, “Prediction of arrival times of freight traffic on US railroads using support vector regression.” *Transportation Research Part C: Emerging Technologies*, 93, pp. 211-227, 2018.
7. Yanning Li, **J. Carlos Martínez Mori**, and Daniel Work, “Estimating traffic conditions from smart work zone systems.” *Journal of Intelligent Transportation Systems*, 22:6, pp. 490-502, 2018.
8. **J. Carlos Martínez Mori**, William Barbour, Shankara Kuppa, and Daniel Work, “Predicting Delay Occurrence at Freight Rail Sidings.” In *Proceedings of the 97th Transportation Research Board Annual Meeting*, 2018.
9. Yanning Li, **J. Carlos Martínez Mori**, and Daniel Work, “Improving the effectiveness of smart work zone technologies.” Tech. Report FHWA-ICT-16-021, *Illinois Center for Transportation*, 2016.

Academic Talks and Posters

“On the Value of Dynamism in Transit Networks.” Talk at the *11th Triennial Symposium on Transportation Analysis (TRISTAN XI)*, Mauritius, June 19-25, 2022.

“On the Value of Dynamism in Transit Networks.” Talk at the *Institute for Pure and Applied Mathematics Mathematical Challenges and Opportunities for Autonomous Vehicles Reunion Conference 1 (AVRC1)*, Lake Arrowhead, CA, June 5-10, 2022.

“On the Request-Trip-Vehicle Assignment Problem: How Ridesharing Works.” Talk at the *Joint Mathematics Meetings*, online, April 6-9, 2022.

“Permutatorial Optimization via the Permutahedron.” Talk at the *Joint Mathematics Meetings*, online, April 6-9, 2022.

“On the Value of Demand-Responsiveness in Transit Systems.” Poster at the *Google Workshop on Urban Mobility Simulation and Optimization*, online, November 16-17, 2021.

“On the Value of Demand-Responsiveness in Transit Systems.” Talk at the *INFORMS Annual Meeting*, online, October 24-27, 2021.

“On the Request-Trip-Vehicle Assignment Problem.” Talk at the *1st SIAM Conference on Applied and Computational Discrete Algorithms*, online, July 21, 2021.

“On the Request-Trip-Vehicle Assignment Problem.” Talk at the *Institute for Pure and Applied Mathematics*, online, October 13, 2020.

“Algorithmic Challenges In Enabling High-capacity Ride Pooling Services.” Talk at the *INFORMS Annual Meeting*, Seattle, WA, October 20-23, 2019.

“Predicting Delay Occurrence at Freight Rail Sidings.” Talk at the *97th Transportation Research Board Annual Meeting*, Washington, D.C., January 7-11, 2018.

“Improving traffic estimation in smart work zone systems.” Poster at the *65th Illinois Traffic Engineering and Safety Conference*, Champaign, IL, October 19-20, 2016.

Activities

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| Institute for Pure and Applied Mathematics | Los Angeles, CA |
| Program: <i>Latinx in the Mathematical Sciences Conference</i> | Summer 2022 |
| Participant | |

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| Centro de Modelamiento Matemático | Santiago, Chile (<i>online</i>) |
| Program: <i>XVII Escuela de Verano en Matemáticas Discretas</i> | Winter 2022 |
| Participant | |

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| American Institute of Mathematics | San Jose, CA (<i>online</i>) |
| Program: <i>Latinx Mathematicians Research Community</i> | Summer 2021 |
| Participant | |

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| Institute for Pure and Applied Mathematics | Los Angeles, CA (<i>online</i>) |
| Program: <i>Mathematical Challenges and Opportunities for Autonomous Vehicles</i> | Fall 2020 |
| Participant | |

INDUSTRY EXPERIENCE

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| Amazon.com | |
| Research Scientist Intern, <i>Consumables Special Projects</i> | Summer 2020 |
| Manager: Elcin Cetinkaya, PhD | |
| Designed and prototyped solution strategies for machine assignment problems arising in order fulfillment. | |

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| Bosch North America | |
| Research Intern, <i>Bosch Energy Research Network</i> | Summer 2017 |
| Manager: Shyam Jade, PhD | |
| Conducted city-scale traffic micro-simulations using MATSim to characterize powertrain requirements of future traffic with electric, autonomous vehicles. | |

TEACHING AND MENTORING

Publications

1. Tomás Aguilar-Fraga, Yasmin Aguillon, Daniel Alofamoni Quiñonez, Dylan Alvarenga, Aaliyah Celestine, Rebecca Garcia, Parneet Gill, Pamela E. Harris, Imhotep Hogan, Jakeyl Johnson, Kobe Lawson-Chavanu, Lina Liu, **J. Carlos Martínez Mori**, Casandra Monroe, Aaron Ortiz, Lauren Quesada, Cynthia Marie Rivera Sánchez, Christopher Soto, Camelle Tieu, Dirk Tolson III, Jacob van der Leeuw, and Pamela Vargas, “People Over Math: A Co-Created Principle for Successful Research Communities.” MAA Focus, June/July, 2022.
2. **J. Carlos Martínez Mori** (as anonymous), “My Detour into Math.” In Pamela E. Harris and Aris Winger (Eds.), “Read and Rectify: Advocacy Stories From Students of Color in Mathematics,” CreateSpace, 2022.

Experience

Institute for Computational and Experimental Research in Mathematics Providence, RI
Teaching Assistant, Summer@ICERM 2022: *Computational Combinatorics* Summer 2022
Faculty Leads: Susanna Fishel, Pamela Harris, Gordon Rojas Kirby

Mathematical Sciences Research Institute Berkeley, CA (*online*)
Teaching Assistant, MSRI-UP 2021: *Parking Functions: Choose your own adventure* Summer 2021
Faculty Leads: Pamela Harris, Rebecca Garcia
Supported 18 undergraduate students (from groups underrepresented in mathematics) as part of an REU program in enumerative combinatorics.

Cornell University Ithaca, NY
Grader, ORIE 6334: *Combinatorial Optimization* Spring 2022
Instructor: David Shmoys
Graded graduate-level homework assignments on the design and analysis of approximation algorithms.

University of Illinois at Urbana-Champaign Champaign, IL
Engineering Learning Assistant, ENG 100: *Engineering Orientation* Fall 2015, Fall 2016
Introduced first-year students to the engineering profession, including the variety of studies and careers.
Laboratory Assistant, GE 101: *Engineering Graphics & Design* Fall 2014, Spring 2015
Introduced students to computer-aided building design using Autodesk Revit.

RELEVANT COURSEWORK

Cornell University

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| CRP 6860: Sustainable Transportation | MATH 6230: Differential Games & Control |
| CS 6820: Analysis of Algorithms | ORIE 6520: Applied Probability |
| CS 6815: Pseudorandomness | ORIE 6334: Spectral Graph Theory |
| MATH 6710, 6720: Probability Theory I, II | ORIE 6300: Mathematical Programming |
| MATH 6410: Enumerative Combinatorics | ORIE 6180: Online Decision-Making |

ACTIVITIES AND SKILLS

Programming

Python (including pandas, networkx, osmnx, numpy, scikit-learn), Gurobi, FICO Xpress, Matlab

Review Contributions

Transportation Research Part C: Emerging Technologies, IEEE Transactions on Vehicular Technology, Transactions in GIS, TRB Annual Meeting (Transportation Network Modeling, AEP40)