J. Carlos Martínez Mori, Ph.D.

H. Milton Stewart School of Industrial and Systems Engineering
Georgia Institute of Technology
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EDUCATION

Cornell University
Center for Applied Mathematics
Ph.D. in Applied Mathematics, Fall 2017 – Spring 2023
Thesis: Designing Networks, Routing Fleets, and Trying to Find Parking
Committee: Samitha Samaranayake (chair), Pamela Harris, Bobby Kleinberg, David Shmoys
Areas: Discrete optimization, combinatorics

University of Illinois at Urbana-Champaign
B.Sc. in Civil Engineering, Fall 2013 – Spring 2017
Minor in Computer Science
Highest Honors at Graduation
Advisor: Daniel B. Work
Areas: Transportation, infrastructure systems

RESEARCH EXPERIENCE

Georgia Institute of Technology
H. Milton Stewart School of Industrial and Systems Engineering
President's Postdoctoral Fellow, Spring 2024 – Present
Mentor: Alejandro Toriello

Schmidt Science Fellows
Schmidt Science Fellow, Fall 2023 – Present

Simons Laufer Mathematical Sciences Institute (SLMath, formerly MSRI)
Algorithms, Fairness, and Equity
Postdoctoral Fellow (semester program), Fall 2023

Institute for Computational and Experimental Research in Mathematics (ICERM)
Discrete Optimization: Mathematics, Algorithms, and Computation
Participant (semester program), Spring 2023

Institute for Computational and Experimental Research in Mathematics (ICERM)
Summer@ICERM 2022: Computational Combinatorics
Teaching Assistant (summer REU program), Summer 2022
Faculty Leads: Susanna Fishel, Pamela E. Harris, Gordon Rojas Kirby

Mathematical Sciences Research Institute (MSRI)
MSRI-UP 2021: Parking Functions: Choose Your Own Adventure

Teaching Assistant (summer REU program), Summer 2021
Faculty Leads: Rebecca Garcia, Pamela E. Harris

Institute for Pure and Applied Mathematics (IPAM)
Mathematical Challenges and Opportunities for Autonomous Vehicles
Participant (semester program), Fall 2020

Amazon.com
Consumables Special Projects
Research Scientist Intern, Summer 2020
Manager: Elcin Cetinkaya

Bosch North America
Bosch Energy Research Network
Research Intern, Summer 2017
Manager: Shyam Jade

AWARDS

Modern Math Workshop and NDiSTEM Travel Scholarship (IPAM)	Fall 2024
Future Faculty Career Exploration Program (RIT)	Fall 2024
Inclusive STEM Teaching Fellow (Georgia Tech)	Spring 2024
Schmidt Science Fellow (SSF)	Fall 2023 - Present
President's Postdoctoral Fellow (Georgia Tech ISyE)	Spring 2024 - Present
Postdoctoral Fellow (SLMath)	Fall 2023
PRISM Postdoctoral Recruitment Travel Scholarship (OPA at Stanford)	Fall 2022
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

The symbol (a) denotes alphabetical authorship ordering.

Publications

[1] [(a)] Jennifer Elder, Pamela E. Harris, Jan Kretschmann, and **J. Carlos Martínez Mori**, "Cost-sharing in Parking Games." To appear in *Discrete Mathematics and Theoretical Computer Science*, 2024.

[2] [(a)] Tomás Aguilar-Fraga, Jennifer Elder, Rebecca E. Garcia, Kimberly P. Hadaway, Pamela E. Harris, Kimberly J. Harry, Imhotep B. Hogan, Jakeyl Johnson, Jan Kretschmann, Kobe Lawson-Chavanu, **J. Carlos Martínez Mori**, Casandra D. Monroe, Daniel Quiñonez, Dirk Tolson III, and Dwight Anderson Williams II, "Interval and ℓ-interval Rational Parking Functions. " To appear in *Discrete Mathematics and Theoretical Computer Science*, 2024.

[3] [(a)] Hessa Al-Thani, Catherine Babecki, and **J. Carlos Martínez Mori**, "Sparse Graphical Designs via Linear Programming." *Operations Research Letters*, 56, Paper No. 107145, 2024.

[4] **J. Carlos Martínez Mori**, "What is a Parking Function?" *Notices of the American Mathematical Society*, 71(8), pp. 1062-1065, 2024.

[5] [(a)] Jennifer Elder, Pamela E. Harris, Jan Kretschmann, and **J. Carlos Martínez Mori**, "Parking Functions, Fubini Rankings, and Boolean Intervals in the Weak Order of $\mathfrak{S}_n$." To appear in *Journal of Combinatorics*, 2024.

[6] [(a)] Pamela E. Harris, Jan Kretschmann, and **J. Carlos Martínez Mori**, "Lucky Cars and the Quicksort Algorithm." *The American Mathematical Monthly*, 131(5), 417–423, 2024.

[7] [(a)] Douglas Chen, Pamela E. Harris, **J. Carlos Martínez Mori**, Eric Pabón-Cancel, and Gabriel Sargent, "Permutation Invariant Parking Assortments." *Enumerative Combinatorics and Applications*, 4:1, Article #S2R4, 2024.

[8] **J. Carlos Martínez Mori**, M. Grazia Speranza, and Samitha Samaranayake, "On the Value of Dynamism in Transit Networks." *Transportation Science*, 57:3, pp. 578-593, 2023.

[9] [(a)] Yasmin Aguillon, 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." *The American Mathematical Monthly*, 130:7, pp. 618-624, 2023.

[10] [(a)] Pamela E. Harris, Brian Kamau, **J. Carlos Martínez Mori**, and Roger Tian, "On the Outcome Map of MVP Parking Functions: Permutations Avoiding 321 and 3412, and Motzkin Paths." *Enumerative Combinatorics and Applications*, 3:2, Article #S2R11, 2023.

[11] **J. Carlos Martínez Mori** and Samitha Samaranayake, "Permutatorial Optimization via the Permutahedron." *Operations Research Letters*, 50:5, pp. 441-445, 2022.

[12] **J. Carlos Martínez Mori** and Samitha Samaranayake, "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.

[13] **J. Carlos Martínez Mori** and Samitha Samaranayake, "Bounded Asymmetry in Road Networks." *Scientific Reports*, 9, 11951, 2019.

[14] 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.

[15] 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.

[16] **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.

[17] 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.

Manuscripts

[1] **J. Carlos Martínez Mori** and Zhanzhan Zhao, "Modeling Processes of Neighborhood Change." Submitted, 2024.

[2] [(a)] Ben Adenbaum, Jennifer Elder, Pamela E. Harris, and **J. Carlos Martínez Mori**, "Boolean intervals in the weak Bruhat order of a finite Coxeter group." Submitted, 2024.

[3] Sophie Pavia, **J. Carlos Martínez Mori**, Philip Pugliese, Abhishek Dubey, Samitha Samaranayake, and Ayan Mukhopadhyay, "Designing Equitable Transit Networks." Full manuscript, ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO'23) (non-archival).

Talks and Posters

[1] "Modelos Matemáticos de Cambio en el Vecindario: Densidad Poblacional, Transporte Público, y Procesos de Gentrificación." Talk at *Universidad Estatal del Sur de Manabí*, online, February 19, 2024.

[2] "Modeling Processes of Neighborhood Change." Talk at the Workshop on *Mathematical Foundations for Equity in Transportation Systems*, *Institute for Pure and Applied Mathematics*, Los Angeles, CA, January 22-26, 2024.

[3] "Cost-sharing in Parking Games." Talk at the *Algebra, Geometry, and Combinatorics Seminar, Department of Mathematics, San Francisco State University*, San Francisco, CA, November 8, 2023.

[4] "A Friendly Introduction to the Shapley Value and the Combinatorics of Parking." Talk at the *Social Choice Seminar (Fall 2023 Program on Algorithms, Fairness, and Equity), SLMath*, Berkeley, CA, September 27, 2023.

[5] "Parking Long Cars: Consider Being an Early Bird." Talk at the *Algebra Seminar, Department of Mathematical Sciences, University of Wisconsin-Milwaukee*, Milwaukee, WI, January 31, 2023.

[6] "Public Transit, Stability, and Transportation Justice." Talk at the *INFORMS Annual Meeting*, Indianapolis, IN, October 16-19, 2022.

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

[8] "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 I*, Lake Arrowhead, CA, June 5-10, 2022.

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

[10] "Permutatorial Optimization via the Permutahedron." Talk at the *Joint Mathematics Meetings*, online, April 6-9, 2022.

[11] "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.

[12] "On the Value of Demand-Responsiveness in Transit Systems." Talk at the *INFORMS Annual Meeting*, online, October 24-27, 2021.

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

[14] "On the Request-Trip-Vehicle Assignment Problem." Talk at the *Institute for Pure and Applied Mathematics*, online, October 13, 2020.

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

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

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

TEACHING EXPERIENCE

Georgia Institute of Technology
Inclusive STEM Teaching Fellows Institute
Inclusive STEM Teaching Fellow (training program), Spring 2024

Cornell University
CS 4820: Introduction to Analysis of Algorithms
Head Teaching Assistant, Fall 2022
Instructor: Anke van Zuylen
Designed rubrics for and graded upper-level undergraduate coursework on the design and analysis of algorithms. Held regular office hours. Led over a dozen of staff teaching assistants (over 300 students enrolled).

Cornell University
ORIE 6334: Combinatorial Optimization
Grader, Spring 2022
Instructor: David B. Shmoys
Designed rubrics for and graded graduate-level coursework on the design and analysis of approximation algorithms.

University of Illinois at Urbana-Champaign
ENG 100: Engineering Orientation
Engineering Learning Assistant, Fall 2015, Fall 2016
Introduced first-year students to the engineering profession, including the variety of studies and career paths.

University of Illinois at Urbana-Champaign
GE 101: Engineering Graphics & Design
Laboratory Assistant, Fall 2014, Spring 2015
Introduced students to computer-aided building design using Autodesk Revit.

SERVICE

Articles on the Profession

[1] [(a)] 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.

Review Contributions

Discrete Mathematics
Integer Programming and Combinatorial Optimization (IPCO)
Transportation Science
INFORMS Journal on Computing
Innovations in Theoretical Computer Science (ITCS)
Transportation Research Part C: Emerging Technologies
IEEE Transactions on Vehicular Technology
Transactions in GIS
TRB Annual Meeting (Transportation Network Modeling, AEP40)

Leadership

Lathisms
2024 Lathisms Scholarship Selection Committee
Committee member, Spring 2024

Institute for Pure and Applied Mathematics (IPAM)
Workshop on Mathematical Foundations for Equity in Transportation Systems
Co-organizer, Spring 2024