

# J. Carlos Martínez Mori, Ph.D.

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## RESEARCH INTERESTS

- Mathematical optimization and its interface with cooperative game theory
- Applications in transportation and public decision-making, in particular public transit
- Enumerative and algebraic combinatorics, in particular parking functions

## EMPLOYMENT

**University of Colorado Denver**

**Department of Mathematical and Statistical Sciences**

*Assistant Professor*, Fall 2025 – Present

**Georgia Institute of Technology**

**H. Milton Stewart School of Industrial and Systems Engineering**

*Schmidt Science Fellow and President's Postdoctoral Fellow*, Spring 2024 – Summer 2025

Mentor: [Alejandro Toriello](#)

**Simons Laufer Mathematical Sciences Institute (SLMath, formerly MSRI)**

**Algorithms, Fairness, and Equity**

*Postdoctoral Fellow* (semester program), Fall 2023

## 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, transportation, 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

### **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 Science Intern*, Summer 2020

Manager: [Elcin Cetinkaya](#)

### **Bosch North America**

#### **Bosch Energy Research Network**

*Research Intern*, Summer 2017

Manager: [Shyam Jade](#)

## AWARDS

Senior Fellow with Schmidt Science Fellows (SSF)	Fall 2024 - <u>Present</u>
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 with Schmidt Science Fellows (SSF)	Fall 2023 - Summer 2025
President's Postdoctoral Fellow (Georgia Tech ISyE)	Spring 2024 - Summer 2025
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] <sup>(a)</sup> **J. Carlos Martínez Mori** and Alejandro Toriello, “Cooperation and the Design of Public Goods.” In *Proceedings of the 26th ACM Conference on Economics and Computation (EC ‘25)*, extended abstract, pp. 511, 2025.
- [2] <sup>(a)</sup> Ben Adenbaum, Jennifer Elder, Pamela E. Harris, and **J. Carlos Martínez Mori**, “Counting Boolean intervals in the weak Bruhat order of a finite Coxeter group.” *Discrete Mathematics Letters*, 15, pp. 52–59, 2025.
- [3] <sup>(a)</sup> Jennifer Elder, Pamela E. Harris, Jan Kretschmann, and **J. Carlos Martínez Mori**, “Parking Functions, Fubini Rankings, and Boolean Intervals in the Weak Order of  $\mathfrak{S}_n$ .” *Journal of Combinatorics*, 16(1), pp. 65–89, 2025.
- [4] <sup>(a)</sup> Jennifer Elder, Pamela E. Harris, Jan Kretschmann, and **J. Carlos Martínez Mori**, “Cost-sharing in Parking Games.” *Discrete Mathematics and Theoretical Computer Science*, 26(3), Paper No. 5, 2024.
- [5] <sup>(a)</sup> Hessa Al-Thani, Catherine Babecki, and **J. Carlos Martínez Mori**, “Sparse Graphical Designs via Linear Programming.” *Operations Research Letters*, 56, Paper No. 107145, 2024.
- [6] **J. Carlos Martínez Mori**, “What is a Parking Function?” *Notices of the American Mathematical Society*, 71(8), pp. 1062-1065, 2024.
- [7] <sup>(a)</sup> 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.
- [8] <sup>(a)</sup> 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  $\ell$ -interval Rational Parking Functions.” *Discrete Mathematics and Theoretical Computer Science*, 26(1) *Permutation Patterns 2023*, Paper No. 10, 2024.
- [9] <sup>(a)</sup> 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.
- [10] **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.
- [11] <sup>(a)</sup> 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.
- [12] <sup>(a)</sup> 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.

- [13] **J. Carlos Martínez Mori** and Samitha Samaranayake, “Permutatorial Optimization via the Permutahedron.” *Operations Research Letters*, 50:5, pp. 441-445, 2022.
- [14] **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.
- [15] **J. Carlos Martínez Mori** and Samitha Samaranayake, “Bounded Asymmetry in Road Networks.” *Scientific Reports*, 9, 11951, 2019.
- [16] 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.
- [17] 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.
- [18] **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.
- [19] 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.

## Preprints

- [1] <sup>(a)</sup> Gian-Gabriel P. Garcia and **J. Carlos Martínez Mori**, “Who’s the GOAT? Sports Rankings and Data-Driven Random Walks on the Symmetric Group.” arXiv, 2024.
- [2] **J. Carlos Martínez Mori** and Zhanzhan Zhao, “Modeling Processes of Neighborhood Change.” arXiv, 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). 2024 INFORMS DEI Best Student Paper Award.

## Talks and Posters

- [1] “Cooperation and the Design of Public Goods.” Talk at the *26th ACM Conference on Economics and Computation (EC ‘25)*, Stanford, CA, July 7-10, 2025.
- [2] “How to Divvy Up the Total Displacement of a Parking Function.” Talk at the *Spring Central Section Meeting of the American Mathematical Society*, Lawrence, KS, March 29, 2025.
- [3] “Cooperation and the Design of Public Goods.” Talk at the *INFORMS Computing Society (ICS) Conference*, Toronto, ON, Canada, March 15, 2025.
- [4] “Cooperation and the Design of Public Infrastructure.” Talk at the *SPREE Seminar Series*, Department of Civil and Environmental Engineering, Northwestern University, Evanston, IL, February 26, 2025.

- [5] “Cooperation and the Design of Public Goods.” Talk at the *Department Seminar*, Department of Mathematical and Statistical Sciences, University of Colorado Denver, Denver, CO, February 10, 2025.
- [6] “Cooperation and the Design of Public Goods.” Talk at the *ISyE Seminar*, H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA, January 28, 2025.
- [7] “On the Mathematics of Transportation Equity: Concepts, Models, and a Couple Tenets.” Talk at the *SIAM Conference on Mathematics of Data Science*, Atlanta, GA, October 25, 2024.
- [8] “Who’s the GOAT? Sports Rankings and Data-Driven Random Walks on the Symmetric Group.” Talk at the *INFORMS Annual Meeting*, Seattle, WA, October 22, 2024.
- [9] “Who’s the GOAT? Sports Rankings and Data-Driven Random Walks on the Symmetric Group.” Talk at the *Discrete Math Seminar*, Kennesaw State University, Marietta, GA, October 9, 2024.
- [10] “Who’s the GOAT? Sports Rankings and Data-Driven Random Walks on the Symmetric Group.” Talk at the *Mathematical Modeling Seminar*, Department of Mathematics, Rochester Institute of Technology, Rochester, NY, September 26, 2024.
- [11] “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.
- [12] “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.
- [13] “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.
- [14] “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.
- [15] “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.
- [16] “Public Transit, Stability, and Transportation Justice.” Talk at the *INFORMS Annual Meeting*, Indianapolis, IN, October 16-19, 2022.
- [17] “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.
- [18] “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.
- [19] “On the Request-Trip-Vehicle Assignment Problem: How Ridesharing Works.” Talk at the *Joint Mathematics Meetings*, online, April 6-9, 2022.

- [20] “Permutatorial Optimization via the Permutahedron.” Talk at the *Joint Mathematics Meetings*, online, April 6-9, 2022.
- [21] “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.
- [22] “On the Value of Demand-Responsiveness in Transit Systems.” Talk at the *INFORMS Annual Meeting*, online, October 24-27, 2021.
- [23] “On the Request-Trip-Vehicle Assignment Problem.” Talk at the *1st SIAM Conference on Applied and Computational Discrete Algorithms*, online, July 21, 2021.
- [24] “On the Request-Trip-Vehicle Assignment Problem.” Talk at the *Institute for Pure and Applied Mathematics*, online, October 13, 2020.
- [25] “Algorithmic Challenges In Enabling High-capacity Ride Pooling Services.” Talk at the *INFORMS Annual Meeting*, Seattle, WA, October 20-23, 2019.
- [26] “Predicting Delay Occurrence at Freight Rail Sidings.” Talk at the *97th Transportation Research Board Annual Meeting*, Washington, D.C., January 7-11, 2018.
- [27] “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] <sup>(a)</sup> 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

Public Transport

Discrete Mathematics

Enumerative Combinatorics and Applications (ECA)

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

**INFORMS Ambassadors 2025**

**Leveraging the INFORMS Annual Meeting Host City Rotation to Improve the Visibility of ORMS Among Students at PUIs: The INFORMS PROMISE Scholars Program**

*Co-organizer*, Spring 2025

**Lathisms**

**2024 Lathisms Scholarship Selection Committee**

*Committee member*, Spring 2024

## **REFERENCES**

- [1] Alejandro Toriello  
Professor, Georgia Institute of Technology  
atoriello@isye.gatech.edu
- [2] Samitha Samaranayake  
Associate Professor, Cornell University  
samitha@cornell.edu
- [3] Pamela E. Harris  
Professor, University of Wisconsin-Milwaukee  
peharris@uwm.edu