

# Gabriel Zayas-Cabán

**Industrial and Systems Engineering**  
**University of Wisconsin-Madison**  
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## Education

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09/2008 – 01/2015 **Cornell University**  
Ithaca, NY PhD in Applied Math (thesis T.01 below)  
MS in Applied Math

08/2003 – 05/2008 **University of South Florida**  
Tampa, FL BA in Mathematics

## Professional Experience

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08/2017 – present **Industrial & Systems Engineering, University of Wisconsin-Madison**  
Madison, WI Assistant Professor

09/2015 – 09/2017 **Industrial & Operations Engineering, University of Michigan**  
Ann Arbor, MI Post Doctoral Presidential Fellow

01/2015 – 09/2015 **Industrial & Operations Engineering, University of Michigan**  
Ann Arbor, MI Research Fellow

05/2014 – 01/2015 **Industrial & Operations Engineering, University of Michigan**  
Ann Arbor, MI Visitor

## Publications

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Refereed Journal Articles (appeared or accepted)

- <sup>1</sup> *J.19* David-Gomez, J. C., Cochran, A.L., Patterson, B.W., and Zayas-Cabán, G.<sup>†</sup> (2024).  
Evaluation of a Split Flow Model for the Emergency Department. *Manufacturing & Service Operations Management*.
- J.18* Pfaff, A., Cochran, A.L., Vechinski, J., Molfenter, T., and Zayas-Cabán, G.\* (2023).  
The Association Between Attitudes and the Provision of Medications for Opioid Use Disorder (MOUD) in United States Jails. *Drug and Alcohol Dependence Reports*.

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<sup>1†</sup> - corresponding author; trainee as first author

- J.17 Alvarez-Avendano S. A., Alagoz, O., Oruongo, J., and Zayas-Cabán, G.<sup>†</sup> (2023). Optimizing Patient Transitions to Skilled Nursing Facilities. *IISE Transactions*.
- J.16 David-Gomez, J. C., Cochran, A.L., Smith, M., and Zayas-Cabán, G.<sup>†</sup> (2023). Prediction of Rehospitalization Risk for Skilled Nursing Facilities Using a Dimension Reduction Approach. *BMC Geriatrics*, 23(1), pp 394.
- J.15 Zayas-Cabán, G.<sup>†</sup>, Cochran, A.L (2023). Scheduling servers in a two-stage queue with abandonments and costs. *Probability in the Engineering and Informational Sciences*, 37 (3), pp 833-851.
- J.14 Odeh-Couvertier, V. Y., Patterson, B.W., and Zayas-Cabán, G.<sup>†</sup> (2022). Association Between Advanced Image Ordered in the Emergency Department on Subsequent Imaging for Abdominal Pain Patients. *Academic Emergency Medicine*, 29(9), pp 1078-1083.
- J.13 White, V.M., Alvarez-Avendano, S. A.(co-first author), Albert, L., Zgierska, A., Balles, J., and Zayas-Cabán, G.<sup>†</sup> (2021). Impact of a community-policing initiative promoting substance use disorder treatment over criminal charges on arrest recidivism. *Drug and Alcohol Dependence*, 227(0376-8716), pp 108915-108921.
- J.12 Sagaroc Gruichich, T., David-Gomez, J. C., McInnis, M.G., Zayas-Cabán, G., Cochran, A.L. (2021). A Digital Self-Report Survey of Mood for Bipolar Disorder. *Bipolar Disorders*, 23(8), pp 810-820.
- J.11 Alvarez-Avendano, S. A., Cochran, A.L., Patterson, B.W., Shah, M.N., Smith, M., and Zayas-Cabán, G.<sup>†</sup> (2020). The Average Effect of Emergency Department Admission on Readmission and Mortality for Older Adults With Chest Pain. *Medical Care*, 58(10), pp 881-888.
- J.10 Zayas-Cabán, G., Lodree, E.J., Kaufman, D.L. (2020). Optimal Control of Parallel Queues for Managing Volunteer Convergence. *Production and Operations Management*, 29(10), pp.2268-2288.
- J.9 Cochran, A. L., Rathouz P.J., Kocher, K. E., and Zayas-Cabán, G.<sup>†</sup> (2019). A Latent Variable Approach to Potential Outcomes for Emergency Department Admission Decisions. *Statistics in Medicine*, 38(20), pp 3911-3935.
- J.8 Zayas-Cabán, G.<sup>†</sup>, Jasin, S., and Wang, G. (2019). An Asymptotically Optimal Heuristic for a Non-stationary Finite-Horizon Restless Multi-Armed Multi-Action Bandit. *Advances in Applied Probability*, 51(3), pp 745-772.
- J.7 Zayas-Cabán, G.<sup>†</sup>, Lewis, M. E. (2019). Admission Control in a Two Class Loss System with Periodically Varying Parameters and Abandonments. *Queueing Systems: Theory and Applications*, 94(1), pp 175-210.
- J.6 Zayas-Cabán, G.<sup>†</sup>, Xie, J., Green, L. V., and Lewis, M. E. (2019). Policies for Physician Allocation to Triage and Treatment in Emergency Departments. *IISE Transactions on Healthcare Systems Engineering*, 9(4), pp 342–356.
- J.5 Cochran, A. L., Tarini, B., Kleyn, M., and Zayas-Cabán, G.<sup>†</sup> (2018). Timeliness of the Newborn Screening Process in Michigan Birthing Hospitals. *Maternal and Child Health Journal*, 22(10), pp 1436–1443.

- J.4 **Zayas-Cabán, G.<sup>†</sup>**, Ahn, H.S. (2018). Dynamic Control of a Single Server System when Jobs Change Status. *Probability in the Engineering and Informational Sciences*, 32(3), pp 353–395.
- J.3 **Zayas-Cabán, G.**, Xie, J., Green, L. V., Lewis, M. E. (2016). Dynamic Control of a Tandem System with Abandonments. *Queueing Systems: Theory and Applications*, 84(3), pp 279–293.
- J.2 Odetola, F., **Zayas-Cabán, G.**, Bruski, L., and Lavieri, M. (2016). An Innovative Framework to Improve Efficiency of Interhospital Transfer of Children in Respiratory Failure. *Annals of the American Thoracic Society*, 13(5), pp 671–677.
- J.1 **Zayas-Cabán, G.**, Lewis, M. E., Olson, M., and Schmitz, S. (2013). Emergency Medical Service Allocation in Response to Large Scale Events. *IIE Transactions on Healthcare Systems Engineering*, 3(1), pp 57–68.

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#### Refereed Conference

- C.1 **Chavis, J.**, Cochran, A.L., Kocher, K.E., Washington, V., and **Zayas-Cabán, G.\*** A Simulation Model of Patient Flow Through the Emergency Department to Determine the Impact of a Short Stay Unit On Hospital Congestion. *Proceedings of the 2016 Winter Simulation Conference* T. Huschka, S.E. Chick, P. I. Frazier, T. M. K. Roeder, R. Szechtman, and E. Zhou, eds, Washington D.C., USA, December

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#### Under Review or Revision for Archival Journals

- S.4 **Zayas-Cabán, G.<sup>†</sup>**, Cochran, A.L. A Randomized Routing Control for a Non-stationary Finite Horizon Multi-Class and Multi-Server Queueing System.
- S.3 David-Gomez, J. C., Cochran, A.L., and **Zayas-Cabán, G.<sup>†</sup>** Unveiling Bias in Sequential Decision Making: A Causal Inference Approach for Stochastic Service Systems.
- S.2 Alvarez-Avendano, S. A., Odeh-Covertier, V.Y., Patterson, B.W., Shah, M.N., and **Zayas-Cabán, G.<sup>†</sup>** Outcomes from Admission rather than Discharge for Older adults in the Emergency Department with Vague Presentations.
- S.1 Alvarez-Avendano, S. A., Cochran, A.L., Kocher, K.E., Patterson, B.W., and **Zayas-Cabán, G.<sup>†</sup>** Average Response Curves for Treatment Time in the Emergency Department.

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#### Thesis

- T.01 **Zayas-Cabán, G.** (2014). Dynamic Allocation of Healthcare Resources. *Cornell University Ph.D Thesis*, Ithaca, NY, USA, August.

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#### Web Apps

- WA.01 Timeliness simulator for state and hospital newborn screening programs (With Amy Cochran and Beth Tarini).  
<https://www.newsteps.org/resources/newborn-screening-timeliness-simulator>

## Grants

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- 09/2022 – 08/2023 **American Family Insurance Data Science Institute Award: Quasi-experimental Designs for Learning Systems**  
\$100,000 Team: Amy L. Cochran (PI), **Gabriel Zayas-Cabán (co-PI)**, and Brian W. Patterson (co-PI)  
Sponsor: American Family Insurance through the UW-Madison Data Science Institute
- 07/2021 – 05/2024 **The Average Effect of Emergency Department Admission Decisions for Older Adults with Chest Pain, Abdominal Pain, or Syncope**  
\$389,325 Team: **Gabriel Zayas-Cabán (PI)**  
Sponsors: National Institutes of Health (NIH) and the University of Wisconsin Institute for Clinical and Translational Research KL2 Scholar Program
- 12/2019 – 12/2021 **Disrupting Opioid Supply Chains through Policing: A Mathematical Modeling Framework National Science Foundation**  
\$536,849 Team: Laura Albert (PI) and **Gabriel Zayas-Cabán (Co-PI)**  
Sponsor: National Science Foundation  
Program: Operations Engineering
- 9/2019 – 9/2022 **Optimizing Patient Transitions from Hospitals to Skilled Nursing Facilities**  
\$424,338 Team: Oguzhan Alagoz (Co-PI), Maureen Smith (Co-PI), and **Gabriel Zayas-Cabán (PI)**  
Sponsor: National Science Foundation  
Program: Operations Engineering
- 5/2019 – 8/2019 **INFORMS Summer Training Scholarship**  
\$30,000 Team: Emmett Lodree (PI) and **Gabriel Zayas-Cabán (PI)**  
Sponsor: The Institute for Operations Research and the Management Sciences (INFORMS)  
Program: INFORMS Diversity, Equity, and Inclusion (IDEA) Committee, INFORMS Education Outreach Committee, and INFORMS Minority Issues Forum (MIF)
- 4/2019 – 6/2021 **Excel Initiative**  
\$6,172 Team: **Gabriel Zayas-Cabán (PI)**  
Sponsor: University of Wisconsin-Madison  
Program: The Collaborative for Advancing Learning and Teaching
- 02/2018 **An Application Development for Assessing Hospital Newborn Screening Processes**  
\$48,260 Team: Beth Tarini (PI) and **Gabriel Zayas-Cabán (PI)**  
Sponsor: Health Resources and Services Administration, US Department of Health and Human Services  
Program: NEWSTEPS360
- 01/2018 **The Survival Advantage of Living Donation in the Era of Regional Sharing: Living Donor Liver Transplant Versus Staying on the Wait list for Deceased Donor Liver Transplant**  
\$225,000 Team: Martin Dib (PI) and **Gabriel Zayas-Cabán (Co-Investigator)**  
Sponsor: University of Wisconsin-Madison Department of Surgery

01/2015 – 01/2017 **Improving the Efficiency of Newborn Screening from Collection to Test Results**  
\$350,000 Team: Beth Tarini (PI) and Gabriel Zayas-Cabán (Co-Investigator)  
Sponsor: Robert Wood Johnson Foundation  
Program: Public Health Services and Systems

## Awards

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- 03/2022 **College of Engineering Faculty Equity and Diversity Award**
- 11/2020 **INFORMS MIF Early Career Award**
- 07/2020 – 07/2023 **Jane R. and Jack G. Mandula Assistant Professorship**
- 05/2019 **Selected by a graduating Leaders in Engineering Excellence and Diversity (LEED) scholar as “faculty who most positively influenced their respective undergraduate careers”**
- 09/2015 **University of Michigan’s President’s Postdoctoral Fellowship**
- 09/2011 – 09/2014 **Alfred P. Sloan Fellowship**
- 09/2008 – 09/2011 **National Defense Science and Engineering Graduate Fellowship**
- 2013 **Zellman Warhaft Commitment to Diversity Graduate Student Award**

## Select Invited Presentations

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- 1/2024 **University of Minnesota Department of Industrial & Systems Engineering**  
*Minneapolis, MN* Evaluation of a Split Flow Model for the Emergency Department
- 1/2023 **Dartmouth College Jones Seminar on Science, Technology, & Society**  
*Hanover, NH* Evaluation of a Split Flow Model for the Emergency Department
- 11/2022 **University of Wisconsin-Madison Computation & Informatics in Biology & Medicine Seminar Series**  
*Madison, WI* Evaluation of a Split Flow Model for the Emergency Department
- 11/2022 **North Carolina State University Edward P. Fitts Department of Industrial & Systems Engineering**  
*Raleigh, NC* Evaluation of a Split Flow Model for the Emergency Department
- 11/2020 **University of South Florida Department of Industrial & Management Systems Engineering Del & Beth Kimbler Lecture Series**  
*Virtual* A Latent Variable Approach to Potential Outcomes for Emergency Department Admission Decisions
- 03/2020 **Georgia Institute of Technology H. Milton Stewart School of Industrial & Systems Engineering**  
*Atlanta, GA* A Latent Variable Approach to Potential Outcomes for Emergency Department Admission Decisions

- 10/17/2018 **The University of Texas Rio Grande Valley School of Mathematical & Statistical Sciences**  
McAllen, TX Dynamic Control of a Single Server System when Jobs Change Status
- 02/2017 **Northeastern University Department of Mechanical & Industrial Engineering**  
Boston, MA Dynamic Control of a Single Server System when Jobs Change Status
- 02/2017 **Texas A&M Department of Industrial & Systems Engineering**  
College Station, TX Dynamic Control of a Single Server System when Jobs Change Status
- 02/2017 **University of Tennessee Department of Industrial & Systems Engineering**  
Nashville, TN Dynamic Control of a Single Server System when Jobs Change Status
- 02/2017 **Virginia Commonwealth University Department of Mathematics**  
Richmond, VA Dynamic Control of a Single Server System when Jobs Change Status
- 02/2017 **Johns Hopkins University Department of Civil Engineering**  
Baltimore, MD Dynamic Control of a Single Server System when Jobs Change Status
- 02/2017 **Penn State University Department of Industrial & Manufacturing Engineering**  
University Park, PA Dynamic Control of a Single Server System when Jobs Change Status
- 01/2017 **University of Vermont Grossman School of Business**  
Burlington, VT Dynamic Control of a Single Server System when Jobs Change Status
- 01/2017 **University of Wisconsin-Madison Department of Industrial & Systems Engineering**  
Madison, WI Dynamic Control of a Single Server System when Jobs Change Status
- 11/2016 **University of Southern California Marshall School of Business Department of Data Science & Operations**  
Los Angeles, CA Dynamic Control of a Single Server System when Jobs Change Status
- 05/2016 **University of Michigan Child Health Evaluation & Research Unit Seminar Series**  
Ann Arbor, MI An Innovative Framework to Improve Efficiency of Inter-hospital Transfer of Children in Respiratory Failure
- 09/2014 **University of Michigan Center for Healthcare Engineering & Patient Safety Seminar Series**  
Ann Arbor, MI Optimal Control of an Emergency Room Triage and Treatment Process

## **Professional Activities and Service**

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### Session Chair

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- 2018 – 2019 & 2021 – 2023 INFORMS Annual Meeting
- 2021 Canadian Operations Research Society Annual Conference
- 2019 INFORMS Healthcare

### Program Committee

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- 2021 The Amazon SCOT and INFORMS Fellowship Committee
- 2021 INFORMS MIF Best Paper Award Competition Judge
- 2020 Production and Operations Management Science College of Healthcare Operations Management Best Paper Award Competition Judge
- 2019 INFORMS Health Application Society (HAS) Student Paper Competition Judge
- 2016 Winter Simulation Conference Track Program Committee Chair for the Healthcare Applications

### Peer Reviewing

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Ad hoc reviewer for: 4OR, Drug & Alcohol Dependence, Health Systems, IISE Transactions, IISE Transactions on Healthcare Systems Engineering, Management Science, Manufacturing & Service Operations Management (MSOM), Mathematical Methods in Operations Research, Medical Care, Naval Research Logistics, Operations Research, Operations Research Letters, Probability in the Engineering and Informational Sciences, Production & Operations Management, Queueing Systems: Theory and Applications, Statistics in Medicine, Service Science

### Officer

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- 2012 – 2017 Vice President of Communications for INFORMS MIF

### Professional Memberships

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- 2017 – present INFORMS Diversity, Equity, and Inclusion Committee  
INFORMS Women in OR/MS  
INFORMS Junior Faculty Interest Group
- 2011 – present INFORMS Applied Probability Society  
INFORMS MSOM  
INFORMS HAS  
INFORMS MIF

### University and Departmental Committees

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- 2021 – 2022 & 2023 Inclusion, Diversity, Equity, and Access Task Force
- 2021 – 2023 Department Colloquium Co-organizer
- 2020 – present Decision Sciences & Operations Research Qualifying Exam Committee/Writer
- 2020 – 2021 Student Alumni Affairs Committee
- Fall 2019 Faculty Hiring Committee

2019 – 2022 Wisconsin Institute for Healthcare Systems Engineering Executive Committee  
2018 – 2019 Graduate Engineering Research Scholars Executive Committee  
2018 & 2021 – 2023 Graduate Admissions and Recruiting Committee  
2017, 2019 Faculty Senate  
2017 – 2020 & 2021 Academic Affairs Cluster

## Teaching

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*Fall 2023* **Instructor – ISyE 417 (Health Systems Engineering)**  
*University of Wisconsin*

*Fall 2022* **Instructor – ISyE 417 (Health Systems Engineering)**  
*University of Wisconsin*

*Fall 2021* **Instructor – ISyE 417 (Health Systems Engineering)**  
*University of Wisconsin*

*Spring 2021* **Instructor – ISyE 723 (Dynamic Programming and Associated Topics)**  
*University of Wisconsin*

*Fall 2020* **Instructor – ISyE 417 (Health Systems Engineering)**  
*University of Wisconsin*

*Spring 2020* **Instructor – ISyE 723 (Dynamic Programming and Associated Topics)**  
*University of Wisconsin*

*Fall 2019* **Instructor – ISyE 417 (Health Systems Engineering)**  
*University of Wisconsin*

*Fall 2018* **Instructor – ISyE 417 (Health Systems Engineering)**  
*University of Wisconsin*

*Spring 2018* **Instructor – ISyE 723 (Dynamic Programming and Associated Topics)**  
*University of Wisconsin*

## Students Supervised

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Dissertation Chair (Ph.D. Graduates)

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*Fall 2018 – Summer* **Sebastian Alejandro Alvarez Avedaño**  
*2023* Counterfactual Congestion in Service Systems  
*University of Wisconsin* Currently: Senior Associate in Applied Artificial Intelligence and Machine Learning at JP Morgan



Ph.D. Advisees (Ongoing)

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Fall 2023 – present **Jairo Alejandro Martínez Correa**  
University of Wisconsin

Fall 2022 – present **Giovanni Artiglio**  
University of Wisconsin (co-advised with Qiaomin Xie)

Fall 2022 – present **Bryan Ortiz-Torres**  
University of Wisconsin

Fall 2022 – present **Fernando Acosta-Perez**  
University of Wisconsin (co-advised with Justin Boutillier)

Fall 2020 – present **Valerie Odeh-Couvertier**  
University of Wisconsin

Fall 2018 – present **Juan Camilo David Gomez**  
University of Wisconsin

Fall 2018 – present **Veronica M. White**  
University of Wisconsin (co-advised with Laura Albert)

Thesis Committee (Ph.D.)

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Spring 2023 – present **Dekun Zhou**  
University of Wisconsin

Fall 2022 – present **Nicholas Gallagher**  
University of Wisconsin

2023 **Jinxin Tao**  
University of Wisconsin Improving Decision Making Through Learning

2022 **Wenjun Zhu**  
University of Wisconsin Modeling and Analysis Of Patient Transitions In Healthcare Delivery Systems

2022 **Liz Scaria**  
University of Wisconsin Optimal Interventions to Control Hospital-Associated Clostridioides difficile Infection

2019 **Eric Dubois**  
University of Wisconsin Models for Improving the Resiliency of Homeland Security Systems

2019 **Ravi Suman**  
University of Wisconsin Analysis of Tandem Network of Polling Queues

2019 **Yasemin Limon**  
University of Wisconsin Strategic, Coordination, and Operational Issues in Biomanufacturing

2019 **Hyo Kyung Lee**  
University of Wisconsin Operational Decision Making Across Patient Care Cycle: From Capacity Planning to Care Management

2019 **John Oruongo**  
University of Wisconsin Optimizing Patient Transitions from Hospital to Skilled Nursing Facilities

2019 **Soovin Yoon**  
*University of Wisconsin* Optimal Planning of Tiered Emergency Medical Services

Thesis Committees (M.S.)

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2023 **Aly Pfaff, MS Epidemiology**  
*University of Wisconsin* The Effect of Attitudinal Barriers on the Provision of MOUD in United States Jails

Undergraduate Research

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2019 **Jose Palacios**  
*University of Wisconsin* Summer Undergraduate Research Experience

2018 **Hannah Nguyen**  
*University of Wisconsin* Summer Undergraduate Research Assistant

2015 **Luke Bruski**  
*University of Michigan* Masters Independent Study

2015 **Valerie Washington**  
*University of Michigan* Summer Research Opportunity Program