

CONTACT INFORMATION	Dept. of Industrial & Systems Engineering University of Minnesota 207 Church Street SE Minneapolis, MN 55455 Office: Lind Hall 240D Email: saumya@umn.edu Website: saumya-sinha.github.io
INTERESTS	Optimization under uncertainty, sequential decision-making, robust optimization, healthcare operations, clinical decision-making, health policy.
CURRENT AFFILIATION	Assistant Professor , Industrial & Systems Engineering, University of Minnesota-Twin Cities, Minneapolis, MN Since Aug 2022
PAST EMPLOYMENT	Postdoctoral Research Associate , Computational Applied Mathematics & Operations Research, Rice University, Houston TX Oct 2018-Aug 2022 Visiting Postdoctoral Fellow , Department of Surgery, Houston Methodist Hospital, Houston TX Jul 2019-Jun 2022
EDUCATION	PhD, Applied Mathematics (Advanced Data Science option) August 2018 University of Washington, Seattle WA Dissertation: Robust dynamic optimization: theory and applications Advisor: Archis Ghatge MS, Applied Mathematics March 2015 University of Washington, Seattle WA MS, Mathematics July 2013 TIFR Centre for Applicable Mathematics, Bangalore, India BS (Honors), Mathematics June 2011 St. Stephen's College, University of Delhi, India
PUBLICATIONS & PREPRINTS	3. Characterizing rational transplant program response to outcome-based regulation (D. Mildebrath**, T. Lee, S. Sinha , A.J. Schaefer, A.O. Gaber) To appear in <i>Operations Research</i> . 2. Policy iteration for robust nonstationary Markov decision processes (S. Sinha , A. Ghatge) <i>Optimization Letters</i> , Vol 10(8), 1613-1628 2016. 1. Robust response-guided dosing (S. Sinha , J. Kotas, A. Ghatge) <i>Operations Research Letters</i> , Vol 44(3), 394-399 2016.

** denotes a graduate student in my postdoc research group

SUBMITTED / UNDER REVIEW	<ol style="list-style-type: none"> 3. Approximate policy iteration for robust countable-state Markov decision processes (S. Sinha, A. Ghate) Submitted to <i>SIAM Journal on Control and Optimization</i>. 2. On the strength of Lagrangian duality for multiobjective integer programming (M. Brun*, T. Perini, S. Sinha, A.J. Schaefer) Submitted to <i>Mathematical Programming</i>. (Winner, INFORMS Undergraduate Operations Research Prize, 2022) 1. Relaxations and duality for multiobjective integer programming (A. Dunbar*, S. Sinha, A.J. Schaefer) Under second review at <i>Mathematical Programming</i>. Available on Optimization Online (Finalist for the INFORMS Undergraduate Operations Research Prize, 2020)
WORKING PAPERS	<ol style="list-style-type: none"> 5. A robust multi-period Newsvendor model with inventory balance constraints (S. Sinha, M.R. Wagner, A. Ghate) 4. Incentives in outcome-based regulation for solid organ transplantation (D. Mildebrath**, S. Sinha, T. Lee, A.J. Schaefer, H.J. Huang, A.O. Gaber) 3. Duality for countably infinite integer programs (R. Schellenberger*, S. Sinha, A.J. Schaefer) 2. Value iteration for infinite-horizon risk-sensitive Markov decision processes (D. Zhang*, S. Sinha, M. Hemmati, A.J. Schaefer) 1. Markov decision process design (S. Brown**, S. Sinha, A.J. Schaefer)
TEACHING EXPERIENCE	<p>University of Minnesota</p> <ul style="list-style-type: none"> - Co-instructor, Senior Design (IE 4041) - <i>Spring 2023</i> <p>Rice University</p> <ul style="list-style-type: none"> - Instructor, Stochastic processes and simulation (INDE 572) - <i>Spring 2022</i> - Guest Lecturer, Applied discrete optimization (INDE 597) - <i>Spring 2019</i> <p>University of Washington</p> <p>Instructor:</p> <ul style="list-style-type: none"> - Applied linear algebra & numerical analysis - <i>Summer 2018 & Summer 2017</i> - Introduction to differential equations and applications - <i>Spring 2018</i> - Partial differential equations and waves - <i>Spring 2017</i> <p>Teaching Assistant:</p> <ul style="list-style-type: none"> - Vector calculus and complex variables - <i>Fall 2017 & Fall 2015</i> - Computational methods for data analysis - <i>Winter 2017</i> - Methods for partial differential equations - <i>Spring 2016</i> - Introduction to continuous mathematical modeling - <i>Summer & Winter 2015</i> - Applied linear algebra and numerical analysis - <i>Summer 2015</i>

*, † respectively denote an undergraduate and masters student I supervised.

- Introduction to differential equations and applications - *Summer 2015*
- Advanced methods for partial differential equations - *Spring 2015*
- Algebra with applications - *Fall & Winter 2014*
- Calculus with analytic geometry II - *Fall 2013*

RESEARCH
MENTORSHIP

University of Minnesota

- Ruiqi Wang[†] (since Fall 2023)

Rice University

- Daihan (Jack) Zhang: Value iteration for infinite-horizon risk-sensitive Markov decision processes (since Spring 2022)
- Matthew Brun: Lagrangian duality for multiobjective IPs (Fall 2021-Spring 2022)
- Robert Schellenberger: Duality for countably infinite IPs (Spring 2020-Spring 2022)
- Alex Dunbar: Relaxations and duality for multiobjective IPs (Fall 2018-Summer 2020)

UNDERGRADUATE
ADVISING

University of Minnesota

- Senior design project (5 students): Spring 2023
Topic: Decreasing hospital tube stockouts and optimizing system performance at the University of Minnesota Medical Center

Rice University

- Stormi Allen-Knight: Discrete-event simulation for lung transplantation (REU Data Science, Summer 2022)
- Oren Pazgal: Simulation for transplant patient selection (Summer 2019)
- Carlos Linares: Simulation in Python (Summer 2019)

University of Washington

- Yusha Wang (Spring 2018)
Graduate mentor for the ‘Women in Applied Math Mentorship’ Program.
Topic: Choice modeling and its application to airline network management

PROFESSIONAL
SERVICE &
OUTREACH

Peer-review for journals

- INFORMS Journal on Computing
- Production and Operations Management
- Operations Research Forum
- Optimization Letters

Officer for the INFORMS Forum for Women in OR & Management Sciences (WORMS)

- Secretary, 2020
- Vice-President of Communications, 2021-2022

Session Chair at INFORMS Annual Meetings

- Policy Design in Healthcare, Indianapolis 2022
- OR Methods for Health Policy Design, Anaheim 2021
- Robust and Dynamic Stochastic Optimization, Phoenix 2018
- Statistics- and Information-based Approaches to Stochastic Optimization, Houston 2017

Mentor

- WORMS Mentorship Program – 2018, 2021, 2022
- ‘Women in Applied Math Mentorship’ Program, University of Washington, 2018

Guest Speaker at the AWM Abstract Math Summer Program for non male-identifying high-school students at Rice University, July 2022

Panelist on a ‘Careers in Mathematics’ panel for undergraduate students in mathematical sciences, Rice University, December 2020

Volunteer for multiple community outreach events – conducted math-based games and activities for K-12 students, served as judge for student competitions.

- Science and Engineering Fair of Houston, *February 2020 & 2021*
- Math Olympiad, Seattle, *May 2016*
- Math Moves, Pacific Science Center, Seattle, *March 2016*
- Mathcounts, *February 2015*
- Math Hour Olympiad, *June 2014 & June 2015*
- Julia Robinson Math Festival, *March 2014 & April 2015*
- University of Washington Math Fair, *March 2014 & December 2013*

Co-organizer, Student Seminar Series at TIFR-CAM, 2012-2013

Coordinated weekly campus talks on math-related topics by graduate students.

**AWARDS &
RECOGNITION**

- ‘Rising Stars in Computational & Data Sciences’ Workshop, University of Texas, Austin, 2020
- INFORMS Doctoral Student Colloquium, 2017
- William and Marilyn Conner Endowed Fellowship, University of Washington, 2014
- INSPIRE Scholarship, Department of Science & Technology, Government of India, 2008
- National Talent Search Scholarship, National Council for Educational Research & Training, India, 2006

INVITED TALKS

- INFORMS Healthcare Conference, July 2023, Toronto (planned)
- Mixed-integer Programming Workshop, May 2023, Los Angeles (planned)
- Graduate student seminar, Industrial & Systems Engineering, University of

Minnesota, November 2022

- Texas A&M University, AMS Student Chapter Seminar, November 2022
- INFORMS Annual Meeting, October 2022, Indianapolis
- Indian Institute of Science Education and Research, Bhopal, India, March 2022
- Virginia Tech, February 2022
- Beedie School of Business, Simon Fraser University, February 2022
- University of Minnesota, February 2022
- Ohio State University, January 2022
- Colorado School of Mines, January 2022
- Indian Institute of Management, Bangalore, India, December 2021
- Tippie College of Business, University of Iowa, December 2021
- Indian School of Business, December 2021
- INFORMS Annual Meeting, October 2021, Anaheim
- INFORMS Annual Meeting, November 2020 (Virtual)
- Rising Stars 2020, October 2020 (Virtual)
- INFORMS Annual Meeting, November 2018, Phoenix
- INFORMS Annual Meeting, October 2017, Houston
- Applied Mathematics Seminar, December 2017, University of Washington, Seattle
- INFORMS Applied Probability Society Conference, July 2017, Evanston
- SIAM Conference on Optimization, May 2017, Vancouver, Canada
- INFORMS Annual Meeting, November 2015, Philadelphia

WORKSHOPS & VISITS

- Mixed-integer Programming Workshop at University of Southern California, Los Angeles - *May 2023 (planned)*
- Rising Stars 2020 at University of Texas, Austin - *October 2020 (virtual)*
- Industrial Mathematics Workshop at Institute for Mathematics and its Applications, Minneapolis - *July 2017*
- Visiting student at International Centre for Theoretical Sciences, India - *September 2016*
Studied theoretical and numerical aspects of matrix completion problems.
- Statistical & Applied Mathematical Sciences Institute (SAMSI) Optimization Summer School - *August 2016*
- Software Carpentry Workshop at University of Washington - *January 2015*

PROFESSIONAL MEMBERSHIPS

- Institute for Operations Research & Management Sciences (INFORMS)
- INFORMS Health Applications Society
- INFORMS Forum for Women in OR/MS (WORMS)
- Society for Industrial & Applied Mathematics (SIAM)

Last updated on February 28, 2023.