Curriculum Vitae **Saumya Sinha**

CONTACT INFORMATION

DCH-2038, Rice University,
Houston, TX - 77005

Email: saumya.sinha@rice.edu
Website: saumya-sinha.github.io

RESEARCH INTERESTS

Optimization under uncertainty, data-driven optimization, stochastic dynamic programming, operations research in healthcare applications.

CURRENT AFFILIATION

Postdoctoral Research Associate October 2018 - present
Rice University, Houston TX
Working with Andrew Schaefer on stochastic and mixed-integer optimization, with a focus on applications in healthcare.

Visiting Postdoctoral Fellow July 2019 - present
Houston Methodist Hospital, Houston TX
Using operations research methodology for risk-benefit assessment of organ transplant patients, and studying strategic implications of the same.

EDUCATION

PhD, Applied Mathematics (minor in Advanced Data Science) August 2018
University of Washington, Seattle WA
Dissertation: Robust dynamic optimization: theory and applications
Advisor: Archis Ghate

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

6. Relaxation and duality for multiobjective integer programming (A. Dunbar, **S. Sinha**, A.J. Schaefer.) *In preparation.*
   Finalist for the INFORMS Undergraduate Operations Research Prize, 2020
5. Approximate policy iteration for robust countable-state Markov decision processes (**S. Sinha**, A. Ghate) *In preparation.*
4. A robust multi-period newsvendor model with inventory balance constraints (**S. Sinha**, M.R. Wagner, A. Ghate.) *In preparation.*
3. Optimizing lung transplantation waitlist composition from the transplant program's perspective (D. Mildebrath, T. Lee, **S. Sinha**, A.J. Schaefer, A.O. Gaber) *Second review, Operations Research.*
2. Policy iteration for robust nonstationary Markov decision processes (**S. Sinha**, A. Ghate.) *Optimization Letters*, Vol 10(8), 1613-1628 2016.
1. Robust response-guided dosing (**S. Sinha**, J. Kotas, A. Ghate) *Operations Research Letters*, Vol 44(3), 394-399 2016.

TEACHING EXPERIENCE

Graduate Instructor, University of Washington, Seattle.

- Applied Linear Algebra And Numerical Analysis - *Summer 2018* and *Summer 2017*
- Introduction To Differential Equations And Applications - *Spring 2018*
- Partial Differential Equations and Waves - *Spring 2017*

Teaching Assistant, University of Washington, Seattle.

- Vector Calculus and Complex Variables - *Fall 2017* and *Fall 2015*
- Computational Methods for Data Analysis - *Winter 2017*
- Methods for Partial Differential Equations - *Spring 2016*
- Introduction to Continuous Mathematical Modeling - *Summer* and *Winter 2015*
- Applied Linear Algebra And Numerical Analysis - *Summer 2015*
- Introduction to Differential Equations and Applications - *Summer 2015*
- Advanced Methods for Partial Differential Equations - *Spring 2015*
- Algebra with Applications - *Fall* and *Winter 2014*
- Calculus with Analytic Geometry II - *Fall 2013*

MENTORSHIP

Student supervision, Rice University, Houston — Since November 2018
Supervising undergraduate students with individual research projects

Graduate mentor, University of Washington, Seattle. — Spring 2018
Supervised an undergraduate student in a reading course as part of the 'Women in Applied Math Mentorship' Program
Topic: Choice modeling and its application to airline network management

Undergraduate Research Mentor, TIFR CAM, Bangalore, India. — May 2013
Supervised 20 undergraduate students in a summer research program; assisted with designing models for optimal town-planning using network structure

PROFESSIONAL SERVICE & OUTREACH

Secretary for the INFORMS Forum for Women in Operations Research and Management Sciences (WORMS), 2020

Session Chair, INFORMS Annual Meeting, 2018
Title: Robust and Dynamic Stochastic Optimization

Session Chair, INFORMS Annual Meeting, 2017
Title: Statistics- and Information-based Approaches to Stochastic Optimization

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

Co-organizer, Student Seminar Series at TIFR-CAM
Coordinated weekly campus talks on math-related topics by graduate students.

AWARDS & RECOGNITION

- Rising Stars 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 and Training, India, 2006

TALKS

- Relaxation and duality for multiobjective integer programming
  INFORMS Annual Meeting, November 2020 (Virtual)
- Patient Selection for lung transplantation: a transplant program perspective
  Rising Stars 2020, October 2020 (Virtual)
- Robust countable-state Markov decision processes
  INFORMS Annual Meeting, November 2018, Phoenix
  INFORMS Annual Meeting, October 2017, Houston
  INFORMS Applied Probability Society Conference, July 2017, Evanston
  SIAM Conference on Optimization, May 2017, Vancouver, Canada
- A robust multi-period Newsvendor model with inventory balance constraints
  INFORMS Annual Meeting, November 2018, Phoenix
  Applied Mathematics Seminar, December 2017, University of Washington, Seattle
- Policy iteration for robust nonstationary Markov decision processes
  INFORMS Annual Meeting, November 2015, Philadelphia

WORKSHOPS & VISITS

- Rising Stars 2020 at University of Texas, Austin - *October 2020 (Virtual)*
- Industrial Mathematics Worksop at Institute for Mathematics and its Applications - *July 2017*
- Visiting student at International Centre for Theoretical Sciences, India - *September 2016*
  Studied theoretical and numerical aspects of matrix completion problems.
- SAMSI Optimization Summer School at Statistical & Applied Mathematical Sciences Institute - *August 2016*
- Software Carpentry Workshop at University of Washington - *January 2015*

SEMINARS & PROJECTS

- Mapping dengue vulnerability in Peru
  Final course project, Data Visualization, Spring 2018
- Airline revenue management using mixed-integer programming
  Final course project, Integer Programming, Winter 2017
- Binary classification using Stochastic Dual Coordinate Ascent
  Final course project, Machine Learning, Fall 2016
- Influence of food access and poverty on obesity
  Final course project, Introduction to Data Science, Fall 2015
- Adaptive mesh refinement for 1-D hyperbolic partial differential equations
  Final course project, Conservation Laws and Finite Volume Methods, Winter 2015
- Approximate solution of weakly-coupled Markov decision processes: application to allocation problems
  Final Seminar, Reading Course, Autumn 2013
- Stability and bifurcation behavior in non-linear dynamical systems: logistic map
  Final course project, Numerical Analysis and Scientific Computing, Autumn 2012
- Hausdorff dimension of the Cantor set
  Final course project, Measure Theory, Winter 2012
- Web-search algorithms: Google PageRank
  Final course project, Linear Algebra, Autumn 2011
- Isomorphism in groups of infinite cardinality
  Final course project, Abstract Algebra II, March 2011

- Optimization algorithms: theory of the simplex method.
  Final course project, Linear Programming & Game Theory, March 2011

SELECTED COURSEWORK

- Optimization in System Sciences
- Mathematical Programming
- Network Optimization
- Integer Programming
- Machine Learning
- Computational Methods for Data Analysis
- Econometrics
- Data Visualization

Last updated on November 30, 2020.