

Vinit Ranjan

Postdoctoral Associate
MIT Sloan School of Management

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Education

Princeton University

PhD in Operations Research & Financial Engineering

- Thesis: “Verification of first-order methods for parametric optimization problems”
- Supervision: [Prof. B. Stellato](#)

Princeton, NJ

Aug 2020 - Jan 2026

Duke University

B.S. in Computer Science, Mathematics

- Minor in Financial Economics
- Graduation Honors: Magna Cum Laude, GPA: 3.929/4.00

Durham, NC

Aug 2016 - Dec 2019

Research Interests

- Algorithm verification and design for real-time, large-scale decision making.
- Machine learning to accelerate optimization algorithms.
- Applications in large-scale optimization applications, including portfolio optimization, control of high-speed autonomous systems, and routing problems.

Professional Experience

Quantbot Technologies

Quantitative Research Intern

New York, NY

May 2023 - Aug 2023

Google Health Research Team

Software Engineering Intern

Palo Alto, CA

May 2019 - Aug 2019

Lineage Logistics

Research Intern

San Francisco, CA

May 2018 - Aug 2018, Jan 2020 - Jun 2020

Research Experience

MIT Sloan School of Management

Postdoctoral Research

- Project: “Scalable GPU-Accelerated Optimization Methods”
- Supervision: H. Lu

Cambridge, MA

Aug 2026 - Present

Princeton University

PhD Research, Postdoctoral Research

- Project: “Numerical Verification and Design of Fast First-order Optimization Algorithms”
- Supervision: B. Stellato

Princeton, NJ

Jan 2021 - Jun 2026

Quantbot Technologies

Quantitative Research Intern

- Project: “Feature Selection Methods via Accelerated Convex Optimization and Machine Learning Schemes”
- Supervision: R. Der and L. Tang

New York, NY

May 2023 - Aug 2023

Lineage Logistics

Research Intern

- Project: “Geometric Algorithms for Point Cloud Filtering”
- Supervision: E. Wolf and C. Eckman

San Francisco, CA

May 2018 - Aug 2018, Jan 2020 - Jun 2020

Duke University Computer Science Department

Undergraduate Student Researcher

- Project: “Machine Learning Applications in Healthcare”
- Supervision: L. Carin

Durham, NC
Aug 2017 - May 2018

Duke University Mathematics Department

Undergraduate Student Researcher

- Project: “Block Size in Geometric(p)-biased Permutations”
- Supervision: R. Durrett, M. Junge, and J. Nolen

Durham, NC
May 2017 - Aug 2017

Awards

- Best Poster Award Jul 2024
Princeton Workshop on Optimization, Learning, and Control
- Karl Menger Award (2x Recipient) May 2017, May 2019
Duke University Mathematics Department for excellence in mathematical competitions
- Leonard Euler Prize (COMAP Scholarship, \$10,000) May 2019
*2019 Consortium for Mathematics and Its Applications (COMAP), Mathematical/Interdisciplinary Contest in Modeling (MCM/ICM), **Outstanding solution** (top 7 out of 5000+)*
- Reproducible Research Competition, 2nd place Oct 2018
Carnegie Mellon Sports Analytics Conference
- Meritorious Solution May 2018
Top 15% solution in 2018 COMAP MCM/ICM
- Finalist Solution May 2017
Top 11 of 1500+ in 2017 COMAP MCM/ICM
- Duke University Dean’s List Multiple semesters
For earning a top GPA, earned with distinction in Fall 2016, Spring 2017, Spring 2019, and additionally in Fall 2017, Spring 2018.

Publications

Journal articles

- [J5] **V. Ranjan**, J. Park, S. Gualandi, A. Lodi, and B. Stellato, “[Exact verification of first-order methods via mixed-integer linear programming](#),” *SIAM Journal on Optimization* (Accepted), May 2026.
 [Code repository](#).
- [J4] **V. Ranjan** and B. Stellato, “[Verification of first-order methods for parametric quadratic optimization](#),” *Mathematical Programming*, Jul. 2025.
 [Code repository](#).
- [J3] **V. Ranjan**, J. Ryang, and A. Xue, “Time to leave the louvre: A computational network analysis,” *The Journal of Undergraduate Mathematics and Its Applications*, vol. 40, no. 2-3, pp. 135–160, 2019.
- [J2] I. Cristali, **V. Ranjan**, J. Steinberg, E. Beckman, R. Durrett, M. Junge, and J. Nolen, “[Block size in geometric\(p\)-biased permutations](#),” *Electronic Communications in Probability*, vol. 23, 2018.
- [J1] **V. Ranjan**, J. Ryang, and K. Zhang, “[An analysis of the impact of self-driving cars on traffic conditions](#),” *SIAM Undergraduate Research Online*, vol. 11, 2018.

Preprints

- [P3] **V. Ranjan**, D. Deza, A. Acharya, J. Park, and B. Stellato, “FOMTools: A python toolbox for verification of first-order methods,” e-print: [Working](#).
 In preparation.

[P2] **V. Ranjan**, J. Park, and B. Stellato, “Distributionally-robust learning to optimize,” *arXiv e-prints*, May 2026. arXiv: [2605.06585](#).
 [Code repository](#).

[P1] J. Park, **V. Ranjan**, and B. Stellato, “Data-driven analysis of first-order methods via distributionally robust optimization,” *arXiv e-prints*, Nov. 2025. arXiv: [2511.17834](#).
 [Code repository](#).

Thesis

[T1] **V. Ranjan**, “Beyond the worst case: Verification of first-order methods for parametric optimization problems,” PhD thesis, Princeton University, Jan. 2026.

Teaching Experience

Princeton University , Graduate Assistant in Instruction	Fall 2021 - Present
Undergraduate Optimization	Spring 2022, 2023, 2024
- Course material and code on Github. - Appointed Head Assistant in Instruction during the Spring 2024 term.	
Graduate Optimization	Fall 2023
Professor: I. Akrotirianakis	
Optimal Learning	Fall 2021
Professor: M. Soner	
Duke University , Undergraduate Teaching Assistant	Fall 2017 - Fall 2019
Discrete Mathematics for Computer Science	Fall 2017, 2018, 2019
- Professor: B. Donald - Appointed as Head Undergraduate Teaching Assistant during the Fall 2019 term.	
Intro to Operating Systems	Spring 2019
Professor: A. Lebeck	
Intro to Design/Analysis of Algorithms	Spring 2018
Professor: D. Panigrahi	

Selected Invited Talks

• International Conference on Continuous Optimization, <i>Los Angeles</i> , CA	Jul 2025
• European Conference on Advances in Continuous Optimization, <i>Southampton</i> , UK	Jun 2025
• INFORMS Annual Meeting (Session Chair), <i>Seattle</i> , WA	Oct 2024
• International Symposium of Mathematical Programming, <i>Montreal</i> , Canada	Jul 2024
• INFORMS Annual Meeting, <i>Phoenix</i> , AZ	Oct 2023
• INFORMS Annual Meeting, <i>Indianapolis</i> , IN	Oct 2022
• International Conference on Continuous Optimization, <i>Lehigh</i> , PA	Jul 2022
• Sports Analytics Conference, <i>Carnegie Mellon University</i> , PA	Oct 2018

Technical Skills

- **Programming:** Python, R, Java, C/C++
- **Software:** Git, SLURM, $\LaTeX$