

# Vinit Ranjan

PhD Candidate  
Princeton University

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## Education

### Princeton University

PhD in Operations Research & Financial Engineering

- Thesis: “Data-driven Algorithm Verification and Design for Real-time Optimization”
- Supervision: [Prof. B. Stellato](#)

Princeton, NJ

Aug 2020 - Present

### 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 decision making.
- Machine learning to accelerate optimization algorithms.
- Applications in fast real-time optimization, including portfolio optimization and control of high-speed autonomous systems.

## 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

### Princeton University

PhD Research

- Project: “Algorithm Verification and Design for Real-Time Optimization”
- Supervision: B. Stellato

Princeton, NJ

Jan 2021 - Present

### 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

### Linear 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







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- 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

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### Preprints

- [P4] **V. Ranjan** and B. Stellato, "Algoverify: A python toolbox for verification of first-order methods," e-print: [Working](#).  
 In preparation.
- [P3] J. Park, **V. Ranjan**, and B. Stellato, "Data-driven analysis of first-order methods via distributionally robust optimization," e-print: [Working](#).  
 In preparation.
- [P2] **V. Ranjan**, J. Park, S. Gualandi, A. Lodi, and B. Stellato, "Exact verification of first-order methods via mixed-integer linear programming," *arXiv e-prints*, Dec. 2024. arXiv: [2412.11330](#).  
 First round review in *SIAM Journal on Optimization*.  
 [Code repository](#).
- [P1] **V. Ranjan** and B. Stellato, "Verification of first-order methods for parametric quadratic optimization," *arXiv e-prints*, Mar. 2024. arXiv: [2403.03331](#).  
 Second round review in *Mathematical Programming*.  
 [Code repository](#).

### Journal articles

- [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.

## Teaching Experience

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<b>Princeton University</b> , Graduate Assistant in Instruction	Fall 2021 - Present
Undergraduate Optimization	Spring 2022, 2023, 2024
– Course material and code on <a href="#">Github</a> .	
– Appointed <b>Head</b> Assistant in Instruction during the Spring 2024 term.	
Graduate Optimization	Fall 2023
– Professor: I. Akrotirianakis	
Optimal Learning	Fall 2021
– Professor: M. Soner	
<b>Duke University</b> , Undergraduate Teaching Assistant	Fall 2017 - Fall 2019
Discrete Mathematics for Computer Science	Fall 2017, 2018, 2019
– Professor: B. Donald	
– Appointed as <b>Head</b> 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

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• 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 University</i> , PA	Jul 2022
• Sports Analytics Conference, <i>Carnegie Mellon University</i> , PA	Oct 2018

## Technical Skills

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