

# Rajiv Sambharya

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## Academic Positions

- **Postdoctoral Researcher, University of Pennsylvania** Sept 2024-  
Electrical and Systems Engineering  
Supervision: George Pappas

## Education

- **Ph.D., Princeton University** Sept 2019-Sept 2024  
Operations Research and Financial Engineering  
Thesis: Learning to Accelerate Optimization Algorithms with Guarantees  
Supervision: Bartolomeo Stellato
- **M.Sc. University of California - Berkeley** Sept 2017-Sept 2018  
Electrical Engineering and Computer Science  
Supervision: Laurent El Ghaoui
- **B.Sc. University of California - Berkeley** Sept 2013-Sept 2017  
Electrical Engineering and Computer Science

## Research Interests

- **Data-driven computational tools for decision-making**  
**Theory:** optimization, machine learning, control theory.  
**Methodology:** machine learning for optimization, real-time optimization, optimization-based control, learning for control, statistical learning theory, computer-assisted optimization analysis.  
**Applications:** autonomous systems, signal processing, robotics, power systems, data science, operations research, finance.

## Publications

### Journal Articles

- J1 R. Sambharya and B. Stellato, "[Learning Algorithm Hyperparameters for Fast Parametric Convex Optimization](#)," *SIAM Journal on Mathematics of Data Science* (conditionally accepted), 2025.
- J2 R. Sambharya and B. Stellato, "[Data-Driven Performance Guarantees for Classical and Learned Optimizers](#)," *Journal of Machine Learning Research*, vol. 26, no. 171, pp. 1–49, 2025.
- J3 R. Sambharya, G. Hall, B. Amos, and B. Stellato, "[Learning to Warm-Start Fixed-Point Optimization Algorithms](#)," *Journal of Machine Learning Research*, vol. 25, no. 166, pp. 1–46, 2024.

### Conference Proceedings

- C1 R. Sambharya, G. Hall, B. Amos, and B. Stellato, "[End-to-End Learning to Warm-Start for Real-Time Quadratic Optimization](#)," in *Proceedings of The 5th Annual Learning for Dynamics and Control Conference*, ser. Proceedings of Machine Learning Research, vol. 211, PMLR, 2023, pp. 220–234.

### Preprints

- P1 R. Sambharya, J. Bok, N. Matni, and G. Pappas, "[Learning Acceleration Algorithms for Fast Parametric Convex Optimization with Certified Robustness](#)," (under review: *SIAM Journal on Optimization*), 2025.
- P2 A. Askari, G. Negiar, R. Sambharya, and L. E. Ghaoui, "[Lifted Neural Networks](#)," 2018.

## Thesis

- T1** R. Sambharya, “Learning to accelerate optimization algorithms with guarantees,” Ph.D. dissertation, Princeton University, 2024.

## Working Papers

- W1** R. Sambharya, N. Matni, and G. Pappas, *Verification of Sequential Convex Programming for Parametric Non-convex Optimization*.
- W2** T. Fujinami, R. Sambharya, N. Matni, and G. Pappas, *Finite-step verification of the iterative linear quadratic regulator*.

## Honors and Awards

- Princeton Excellence in Teaching Award:** Top award winner in engineering 2021
- Princeton McGraw Teaching Fellow:** Led orientation for new teaching assistants 2022-2023
- Princeton SEAS Travel Grant Award:** (INFORMS) 2023

## Talks

### Learning Algorithm Hyperparameters for Fast Parametric Convex Optimization with Certified Robustness

- INFORMS Optimization Society Atlanta, Georgia, March 2026
- INFORMS Annual Meeting Atlanta, Georgia, October 2025
- International Conference on Continuous Optimization Univ. of Southern California, July 2025

### Data-Driven Performance Guarantees for Classical and Learned Optimizers

- Neurips San Diego, California, December 2025
- International Symposium on Mathematical Programming Montreal, Canada, July 2024
- Optimization Learning and Control Workshop (Poster) Princeton University, June 2024
- INFORMS Optimization Society Rice University, March 2024
- Conference on Information Sciences and Systems Princeton University, March 2024

### Learning to Accelerate Optimizers with Guarantees

- Thesis defense Princeton University, September 2024
- George Pappas's group** University of Pennsylvania, May 2024
- REALM lab** MIT, March 2024
- Computational Robotics Group** Harvard University, March 2024

### Learning to Warm-Start Fixed-Point Optimization Algorithms

- Yale Robotics Seminar Yale University, December 2023
- INFORMS Annual Meeting Phoenix, AZ, October 2023
- Modeling and Optimization: Theory and Applications Lehigh University, August 2023

### End-to-End Learning to Warm-Start for Real-Time Quadratic Optimization

- Learning for Dynamics and Control (Poster) University of Pennsylvania, June 2023
- NYC Operations day (Poster) Columbia University, May 2023
- INFORMS Annual Meeting Indianapolis, IN, October 2022

### Accelerating Non-Convex Optimization via Learned Sequential Convexifications

- International Conference on Continuous Optimization Lehigh University, July 2022

### Learning for Real-Time Semidefinite Optimization

- INFORMS Annual Meeting Anaheim, CA (hybrid), October 2021

## Teaching

■	ORF499: Senior Thesis	Spring 2024
■	ORF498: Senior Thesis	Fall 2023
■	ORF363: Computing and Optimization for the Physical and Social Sciences	Spring 2023
■	ORF387: Networks	Fall 2022
■	ORF522: Linear and Nonlinear Optimization (Graduate-level)	Fall 2021
■	ORF307: Optimization	Spring 2021 (Head TA), 2022
■	ORF455: Energy and Commodities Markets	Fall 2020

## Mentoring

■	<b>Research supervision:</b> Guided multiple graduate students in their research (Penn)	2025-
■	<b>Research group leader:</b> Led weekly research group of 11 senior thesis students (Princeton)	2023-2024
■	<b>Teaching assistant orientation leader:</b> Led yearly new TA orientation (Princeton)	2022-2023

## Software

■	Learning Acceleration Algorithms for Fast Parametric Convex Optimization with Certified Robustness <a href="https://github.com/rajivsambharya/learn_algo_steps_robust">https://github.com/rajivsambharya/learn_algo_steps_robust</a>
■	Learning Algorithm Hyperparameters for Fast Parametric Convex Optimization <a href="https://github.com/stellatogrp/learning_algorithm_hyperparameters">https://github.com/stellatogrp/learning_algorithm_hyperparameters</a>
■	Data-Driven Performance Guarantees for Classical and Learned Optimizers <a href="https://github.com/stellatogrp/data_driven_optimizer_guarantees">https://github.com/stellatogrp/data_driven_optimizer_guarantees</a>
■	Learning to Warm-Start Fixed-Point Optimization Algorithms <a href="https://github.com/stellatogrp/l2ws">https://github.com/stellatogrp/l2ws</a>
■	End-to-End Learning to Warm-Start for Real-Time Quadratic Optimization <a href="https://github.com/stellatogrp/l2ws_qp">https://github.com/stellatogrp/l2ws_qp</a>

## Industry Experience

■	Machine Learning Engineer at Linc Global	Sunnyvale, CA, July 2018 - July 2019
■	Software Engineering Intern at Amazon	Seattle, WA, June 2016 - August 2016

## Service

■	INFORMS Optimization Society Session Organizer: AI for Optimization	2026
■	Group Meeting Organizer for the weekly Pappas Group Meeting	2025-
■	Program Committee Member for the <b>ScaleOpt workshop</b> at Neurips	2025
■	INFORMS Optimization Society Session Organizer: Machine Learning for Optimization	2024
■	Princeton Optimization Seminar Organizer	2022-2023

## Peer Review

■	Neurips (x2)
■	Conference on Learning Theory (x2)
■	Learning for Dynamics and Control (x2)
■	Integer Programming and Combinatorial Optimization (x1)

## Technical Skills

■	<b>Programming languages:</b> Python, Matlab, Julia, R, C, Java, SQL, HTML
■	<b>Tools:</b> Git, $\text{\LaTeX}$ , Slurm, GPU, JAX, PyTorch, Tensorflow