

Thomas Cohn

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Education

Massachusetts Institute of Technology

Ph.D. in Computer Science and Engineering

Cambridge, Massachusetts

Sep. 2022 - Present

- Advisor: Russ Tedrake
- GPA 5.00/5.00

S.M. in Electrical Engineering and Computer Science

Sep. 2022 - May 2024

- Advisor: Russ Tedrake
- Thesis Title: [Motion Planning along Manifolds with Geodesic Convexity and Analytic Inverse Kinematics](#)

University of Michigan

Ann Arbor, Michigan

B.S.E. Computer Science and Engineering

Sep. 2017 - May 2022

B.S. Honors Mathematics

- Magna Cum Laude
- Engineering Honors Program
- Minors in Statistics and Music
- GPA 3.74/4.00

Honors and Awards

- 2025 **Best Poster Award**, IROS Workshop on Robotic Data Generation and Evaluation (RoDGE)
- 2025 **Best Workshop Paper Award**, IROS Workshop on Frontiers in Dynamic, Intelligent, and Adaptive Multi-Arm Manipulation
- 2024 **Best Paper Award in Robot Manipulation Finalist**, ICRA
- 2023 **Best Paper Award Finalist**, RSS
- 2022 **Outstanding Undergraduate Research Award**, University of Michigan
- 2021 **1st Place Award**, University of Michigan Engineering Research Symposium

Publications

Conference Publications

- [C3] **Thomas Cohn**, Seiji Shaw, Max Simchowitz, and Russ Tedrake. "Constrained bimanual planning with analytic inverse kinematics". In: *2024 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2024, pp. 6935–6942. **Best Paper in Robot Manipulation Award Finalist**.
- [C2] **Thomas Cohn**, Mark Petersen, Max Simchowitz, and Russ Tedrake. "Non-Euclidean Motion Planning with Graphs of Geodesically-Convex Sets". In: *Proceedings of Robotics: Science and Systems (RSS)*. Daegu, Republic of Korea, July 2023. **Best Paper Award Finalist**.
- [C1] **Thomas Cohn**, Nikhil Devraj, and Odest Chadwicke Jenkins. "Topologically-informed atlas learning". In: *2022 International Conference on Robotics and Automation (ICRA)*. IEEE. 2022, pp. 3598–3604.

Journal Publications

- [J3] **Thomas Cohn**, Mark Petersen, Max Simchowitz, and Russ Tedrake. "Non-Euclidean motion planning with graphs of geodesically convex sets". In: *The International Journal of Robotics Research* 44.10-11 (2025), pp. 1840–1862.
- [J2] Shruti Garg, **Thomas Cohn**, and Russ Tedrake. "Planning Shorter Paths in Graphs of Convex Sets by Undistorting Parametrized Configuration Spaces". In: *IEEE Robotics and Automation Letters* (2025).
- [J1] **Thomas Cohn**, Odest Chadwicke Jenkins, Karthik Desingh, and Zhen Zeng. "TSBP: Tangent Space Belief Propagation for Manifold Learning". In: *IEEE Robotics and Automation Letters* 5.4 (2020), pp. 6694–6701.

Preprints

- [P3] Lexi Foland, **Thomas Cohn**, Adam Wei, Nicholas Pfaff, Boyuan Chen, and Russ Tedrake. "How Well do Diffusion Policies Learn Kinematic Constraint Manifolds?" In: *arXiv preprint arXiv:2510.01404* (2025).
- [P2] **Thomas Cohn** and Russ Tedrake. "Sampling-Based Motion Planning with Discrete Configuration-Space Symmetries". In: *arXiv preprint arXiv:2503.00614* (2025). **Accepted for Publication at IROS 2025**.
- [P1] Peter Werner, **Thomas Cohn***, Rebecca H. Jiang*, Tim Seyde, Max Simchowitz, Russ Tedrake, and Daniela Rus. "Faster Algorithms for Growing Collision-Free Convex Polytopes in Robot Configuration Space". In: *arXiv preprint arXiv:2410.12649* (2024). **Accepted for Publication at ISRR 2024. *Denotes equal contribution**.

Workshop Papers

- [W2] Lexi Foland, **Thomas Cohn**, Adam Wei, Nicholas Pfaff, Boyuan Chen, and Russ Tedrake. “How Well do Diffusion Policies Learn Kinematic Constraint Manifolds?” In: *RoDGE: Robotic Data Generation and Evaluation. 2025 International Conference on Intelligent Robots and Systems (IROS)*. 2025. **Best Poster Award**.
- [W1] **Thomas Cohn**, Peter Werner, and Russ Tedrake. “Faster Algorithms for Growing Collision-Free Regions of Constrained Bimanual Configuration Spaces”. In: *Frontiers in Dynamic, Intelligent, and Adaptive Multi-Arm Manipulation. 2025 International Conference on Intelligent Robots and Systems (IROS)*. 2025. **Best Workshop Paper Award**.

Presentations

- 2025 **Poster Presentation**, “How Well do Diffusion Policies Learn Kinematic Constraint Manifolds?”
IROS Workshop on RoDGE: Robotic Data Generation and Evaluation
- 2025 **Oral + Poster Presentation**, “Sampling-Based Motion Planning with Discrete Configuration-Space Symmetries”
IROS
- 2025 **Spotlight Talk + Poster Presentation**, “Faster Algorithms for Growing Collision-Free Regions of Constrained Bimanual Configuration Spaces”
IROS Workshop on Frontiers in Dynamic, Intelligent, and Adaptive Multi-Arm Manipulation
- 2025 **Invited Talk**, “Non-Euclidean Motion Planning with Graphs of Geodesically-Convex Sets”
ICCOPT
- 2025 **Oral Presentation**, “Non-Euclidean Motion Planning with Graphs of Geodesically-Convex Sets”
LIDS Student Conference
- 2024 **Oral + Poster Presentation**, “Constrained Bimanual Planning with Analytic Inverse Kinematics”
ICRA
- 2023 **Poster Presentation**, “Constrained Bimanual Planning with Analytic Inverse Kinematics”
Northeast Robotics Colloquium
- 2023 **Oral + Poster Presentation**, “Non-Euclidean Motion Planning with Graphs of Geodesically-Convex Sets”
RSS
- 2022 **Oral + Poster Presentation**, “Topologically-Informed Atlas Learning”
ICRA
- 2021 **Poster Presentation**, “Topologically-Informed Atlas Learning”
University of Michigan Engineering Research Symposium – 1st Place Award
- 2021 **Poster Presentation**, “Coordinate Chart Particle Filter for Deformable Object Pose Estimation”
University of Michigan Engineering Research Symposium
- 2020 **Oral Presentation**, “TSBP: Tangent Space Belief Propagation for Manifold Learning”
IROS
- 2019 **Poster Presentation**, “TSBP: Tangent Space Belief Propagation for Manifold Learning”
University of Michigan Engineering Research Symposium

Grants and Fellowships

- 2024 **Graduate Research Fellowship**, National Science Foundation
- 2022 **Frederick and Barbara Cronin Fellowship**, Massachusetts Institute of Technology
- 2020 **Raab Family Scholarship**, University of Michigan Marching Band
- 2019 **Wanda W. Lincoln Scholarship**, University of Michigan Marching Band
- 2017 **The Gloria Wille Bell and Carlos R. Bell Scholarship**
- 2017 **Regents Merit Scholarship**, University of Michigan

Teaching

2024 (Spring)	CSCI 5551: Introduction to Intelligent Robotic Systems , Guest Lecture <i>Faculty Instructor: Karthik Desingh</i>	<i>University of Minnesota</i>
2023 (Fall)	6.4210: Robotic Manipulation , Teaching Assistant <i>Faculty Instructor: Russ Tedrake</i>	<i>Massachusetts Institute of Technology</i>
2022 (Winter)	EECS 367: Introduction to Autonomous Robotics , Teaching Assistant <i>Faculty Instructor: Chad Jenkins</i>	<i>University of Michigan</i>
2021 (Fall)	ROB 102: Introduction to AI and Programming , Teaching Assistant <i>Faculty Instructor: Chad Jenkins</i>	<i>University of Michigan</i>
2020 (Winter)	ENGR 100-250: Microprocessors and Toys , Teaching Assistant <i>Faculty Instructor: Peter Chen</i>	<i>University of Michigan</i>
2019 (Winter)	ENGR 100-250: Microprocessors and Toys , Teaching Assistant <i>Faculty Instructor: Peter Chen</i>	<i>University of Michigan</i>

Work Experience

2022-	Graduate Student Research Assistant , Massachusetts Institute of Technology, PI: Russ Tedrake
2016-2022	Undergraduate Student Research Assistant , University of Michigan, PI: Chad Jenkins
2021	Curriculum Designer , Robotics @ Marygrove
2017-2018	Software Developer , Number DNA

Extracurriculars

2022-Present	MIT Graduate Hillel , President 2024-2025
2017-2022	Michigan Marching Band , Cymbal Section Leader 2019-2022
2017-2022	Michigan Hockey Pep Band
2018-2020	Michigan Percussion Chamber Ensemble

Service

2024-Present	Reviewer , ICRA, RA-L, IROS, Acta Astronautica, Humanoids, T-RO, L-CSS, T-MECH, Neurocomputing, T-IE
2024-Present	Graduate School Application Mentor , MIT GAAP Program