

Thomas Cohn

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Education

Massachusetts Institute of Technology

Ph.D. in Computer Science and Engineering

- Advisor: Russ Tedrake
- GPA 5.00/5.00

S.M. in Electrical Engineering and Computer Science

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

Cambridge, Massachusetts

Sep. 2022 - Present

University of Michigan

B.S.E. Computer Science and Engineering

B.S. Honors Mathematics

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

Ann Arbor, Michigan

Sep. 2017 - May 2022

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

*Denotes equal contribution.

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

- [P4] Thomas Cohn*, Lihan Tang*, Alexandre Amice, and Russ Tedrake. "A Framework for Combining Optimization-Based and Analytic Inverse Kinematics". In: *arXiv preprint arXiv:2602.05092* (2026).
[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). Accepted for Publication at ICRA 2026.

- [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.

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

Students Mentored (Research Supervision) ---

Students who co-authored publications or preprints are indicated with *.

Current Students

- 2025- Lexi Foland*, MIT Undergraduate Student.
2025- Lihan Teng*, MIT Undergraduate Student.
2025- Margulan Ismoldayev, MIT Undergraduate Student.

Former Students

- 2023-2025 Shruti Garg*, MIT Undergraduate and Masters Student. Starting PhD at University of Pennsylvania in Fall 2026.

Teaching ---

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

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