

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

*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](#) *University of Minnesota*
Faculty Instructor: Karthik Desingh
- 2023 (Fall) **6.4210: Robotic Manipulation**, Teaching Assistant *Massachusetts Institute of Technology*
Faculty Instructor: Russ Tedrake
- 2022 (Winter) **EECS 367: Introduction to Autonomous Robotics**, Teaching Assistant *University of Michigan*
Faculty Instructor: Chad Jenkins
- 2021 (Fall) **ROB 102: Introduction to AI and Programming**, Teaching Assistant *University of Michigan*
Faculty Instructor: Chad Jenkins
- 2020 (Winter) **ENGR 100-250: Microprocessors and Toys**, Teaching Assistant *University of Michigan*
Faculty Instructor: Peter Chen
- 2019 (Winter) **ENGR 100-250: Microprocessors and Toys**, Teaching Assistant *University of Michigan*
Faculty Instructor: Peter Chen

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