Thomas Cohn

✉ tcohn@mit.edu | ⌂ tommycohn.com

Education

Massachusetts Institute of Technology   *Cambridge, Massachusetts*

Ph.D. in Computer Science and Engineering   *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 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] **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**.

[W1] 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.

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 Engeineering 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 *Faculty Instructor: Karthik Desingh*	*University of Minnesota*
2023 (Fall)	**6.4210: Robotic Manipulation,** Teaching Assistant *Faculty Instructor: Russ Tedrake*	*Massachusetts Institute of Technology*
2022 (Winter)	**EECS 367: Introduction to Autonomous Robotics,** Teaching Assistant *Faculty Instructor: Chad Jenkins*	*University of Michigan*
2021 (Fall)	**ROB 102: Introduction to AI and Programming,** Teaching Assistant *Faculty Instructor: Chad Jenkins*	*University of Michigan*
2020 (Winter)	**ENGR 100-250: Microprocessors and Toys,** Teaching Assistant *Faculty Instructor: Peter Chen*	*University of Michigan*
2019 (Winter)	**ENGR 100-250: Microprocessors and Toys,** Teaching Assistant *Faculty Instructor: Peter Chen*	*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
2024-Present	**Graduate School Application Mentor,** MIT GAAP Program