Thomas Cohn

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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

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*. 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] 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).

[J2] **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* (2024).

[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

[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.**

Presentations

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,** Massachuetts 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-Present

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

2024-Present **Graduate School Application Mentor,** MIT GAAP Program