# 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
B.S. Honors Mathematics — *Sep. 2017 - May 2022*

- 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

[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] Shruti Garg, **Thomas Cohn**, and Russ Tedrake. "Planning Shorter Paths in Graphs of Convex Sets by Undistorting Parametrized Configuration Spaces". In: *arXiv preprint arXiv:2411.18913* (2024).

[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

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

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