# 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

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

[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

[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**.

## Presentations

**2024**  **Paper Presentation,** "Constrained Bimanual Planning with Analytic Inverse Kinematics"
*ICRA 2024*

**2023**  **Poster Presentation,** "Constrained Bimanual Planning with Analytic Inverse Kinematics"
*Northeast Robotics Colloquium 2023*

**2023**  **Paper Presentation,** "Non-Euclidean Motion Planning with Graphs of Geodesically-Convex Sets"
*RSS 2023*

**2022**  **Paper Presentation,** "Topologically-Informed Atlas Learning"
*ICRA 2022*

**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**  **Paper Presentation,** "TSBP: Tangent Space Belief Propagation for Manifold Learning"
*IROS 2020*

**2019**  **Poster Presentation,** "TSBP: Tangent Space Belief Propagation for Manifold Learning"
*University of Michigan Engeineering Research Symposium*

## Grants and Fellowships

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| 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

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| 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

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| 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** |