

TIANYU WANG

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Address: 837 State St NW, Atlanta, GA 30332

EDUCATION

Georgia Institute of Technology (GT), Atlanta, GA

Jan 2021 - Present

PhD in Robotics

GPA: 4.0/4.0

Advisor: Daniel I. Goldman

Carnegie Mellon University (CMU), Pittsburgh, PA

Aug 2018 - May 2020

MS in Mechanical Engineering

GPA: 4.0/4.0

Thesis: Directional compliance in obstacle-aided navigation for snake robots

Advisor: Howie Choset

Shanghai Jiao Tong University (SJTU), Shanghai, China

Sep 2014 - Aug 2018

The University of Michigan-Shanghai Jiao Tong University Joint Institute

GPA: 3.61/4.0

BS in Electrical and Computer Engineering

Research advisor: Guoying Gu

EXPERIENCE

Complex Rheology and Biomechanics Lab, GT

Jan 2021 - Present

Graduate Research Assistant

Advisor: Daniel I. Goldman

Biorobotics Lab, CMU

May 2020 - Dec 2020

Research Staff

Advisor: Howie Choset

Biorobotics Lab, CMU

Sep 2018 - May 2020

Graduate Research Assistant

Advisor: Prof. Howie Choset

Soft Robotics and Biodesign Lab, SJTU

Oct 2016 - Aug 2018

Undergraduate Research Assistant

Advisor: Guoying Gu

PUBLICATIONS

[Google scholar page](#) Total citation (March 27, 2025): 492 H-index: 11

* Co-first authorship

Preprints

- [5] M. Fernandez*, **T. Wang***, G. Tunnicliffe, D. Dortilus, P. Gunnarson, J. O. Dabiri, D. I. Goldman. [AquaMILR+: Design of an untethered limbless robot for complex aquatic terrain navigation](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2025 (accepted).
- [4] **T. Wang***, N. Mankame*, M. Fernandez, V. Kojouharov, D. I. Goldman. [AquaMILR: Mechanical intelligence simplifies control of undulatory robots in cluttered fluid environments](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2025 (accepted).
- [3] M. Iaschi, B. Chong, **T. Wang**, J. Lin, J. He, D. Soto, Z. Xu, D. I. Goldman. [Addition of a peristaltic wave improves multi-legged locomotion performance on complex terrains](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2025 (accepted).
- [2] E. Teder, B. Chong, J. He, **T. Wang**, M. Iaschi, D. Soto, D. I. Goldman. [Effective self-righting strategies for elongate multi-legged robots](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2025 (accepted).
- [1] G. Volpe, *et al.* [Roadmap for Animate Matter](#). 2025.

Refereed Journal Papers

- [J13] B. Liu*, **T. Wang***, D. Kerimoglu, V. Kojouharov, F. L. Hammond III, D. I. Goldman. [Robust self-propulsion in sand using simply controlled vibrating cubes](#). *Frontiers in Robotics and AI*, 2024.
- [J12] **T. Wang***, C. J. Pierce*, V. Kojouharov, B. Chong, K. Diaz, H. Lu, D. I. Goldman. [Mechanical intelligence simplifies control in terrestrial limbless locomotion](#). *Science Robotics*, 2023.
- [J11] B. Chong, J. He, D. Soto, **T. Wang**, D. Irvine, G. Blekherman, D. I. Goldman. [Multi-legged matter transport: a framework for locomotion on noisy landscapes](#). *Science*, 2023.
- [J10] B. Chong, **T. Wang**, B. Lin, S. Li, P. Muthukrishnan, J. He, D. Irvine, H. Choset, G. Blekherman and D. I. Goldman. [Optimizing contact patterns for robot locomotion via geometric mechanics](#). *The International Journal of Robotics Research (IJRR)*, 2023.
- [J9] B. Chong, J. He, S. Li, E. Erickson, K. Diaz, **T. Wang**, D. Soto, D. I. Goldman. [Self-propulsion via slipping: Frictional swimming in multilegged locomotors](#). *The Proceedings of the National Academy of Sciences (PNAS)*, 2023.
- [J8] S. Li*, **T. Wang***, V. Kojouharov, J. McInerney, E. Aydin, Y. Ozkan-Aydin, D. I. Goldman, D. Z. Rocklin. [Robotic swimming in curved space via geometric phase](#). *The Proceedings of the National Academy of Sciences (PNAS)*, 2022.
- [J7] B. Chong, **T. Wang**, E. Erickson, P. J. Bergmann, D. I. Goldman. [Coordinating tiny limbs and long bodies: Geometric mechanics of lizard terrestrial swimming](#). *The Proceedings of the National Academy of Sciences (PNAS)*, 2022.
- [J6] B. Chong, Y. O. Aydin, J. M. Rieser, G. Sartoretti, **T. Wang**, J. Whitman, A. Kaba, E. Aydin, C. McFarland, H. Choset and D. I. Goldman. [A general locomotion control framework for serially connected multi-legged robots](#). *Bioinspiration & Biomimetics*, 2022.
- [J5] B. Chong*, **T. Wang***, J. Rieser, B. Lin, A. Kaba, G. Blekherman, H. Choset and D. I. Goldman. [Frequency modulation of body waves to improve performance of sidewinding robots](#). *The International Journal of Robotics Research (IJRR)*, 2021.
- [J4] **T. Wang***, B. Lin*, B. Chong, J. Whitman, M. Travers, D. I. Goldman, G. Blekherman, H. Choset. [Reconstruction of backbone curves for snake robots](#). *IEEE Robotics and Automation Letters (RA-L)*, 2021.
- [J3] **T. Wang***, L. Ge*, and G. Gu. [Programmable design of soft pneu-net actuators with oblique chambers can generate coupled bending and twisting motions](#). *Sensors and Actuators A: Physical*, 2018.
- [J2] L. Ge*, **T. Wang***, N. Zhang, and G. Gu. [Fabrication of soft pneumatic network actuators with oblique chambers](#). *Journal of Visualized Experiments*, 2018.
- [J1] S. Wei, **T. Wang**, and G. Gu. [Design of a soft pneumatic robotic gripper based on fiber-reinforced actuator](#). *Chinese Journal of Mechanical Engineering*, 2017.

Refereed Conference Papers

- [C8] V. Kojouharov*, **T. Wang***, M. Fernandez, J. Maeng, D. I. Goldman. [Anisotropic body compliance facilitates robotic sidewinding in complex environments](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2024.
- [C7] B. Chong, **T. Wang**, D. Irvine, V. Kojouharov, B. Lin, H. Choset, D. I. Goldman, G. Blekherman. [Gait design for limbless obstacle aided locomotion using geometric mechanics](#). *Robotics: Science and Systems (RSS)*, 2023.
- [C6] **T. Wang***, B. Chong*, Y. Deng, R. Fu, H. Choset, D. I. Goldman. [Generalized omega turn gait enables agile limbless robot turning in complex environments](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.
- [C5] B. Chong, **T. Wang**, B. Lin, S. Li, G. Blekherman, H. Choset, D. I. Goldman. [Moving sidewinding forward: optimizing contact patterns for limbless robots via geometric mechanics](#). *Robotics: Science and Systems (RSS)*, 2021. **Best Paper Award Finalist**
- [C4] G. Sartoretti, **T. Wang**, G. Chuang, Q. Li, H. Choset. [Autonomous decentralized shape-based navigation for snake robots in dense environments](#). *IEEE International Conference on Robotics and Automation (ICRA)*, 2021.
- [C3] **T. Wang***, B. Chong*, K. Diaz, J. Whitman, H. Lu, M. Travers, D. I. Goldman and H. Choset. [The omega turn: a biologically-inspired turning strategy for elongated limbless robots](#). *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2020.
- [C2] B. Chong, **T. Wang**, J. Rieser, A. Kaba, H. Choset and D. I. Goldman. [Frequency modulation of body waves to improve performance of limbless robots](#). *Robotics: Science and Systems (RSS)*, 2020.
- [C1] **T. Wang**, J. Whitman, M. Travers, and H. Choset. [Directional compliance in obstacle-aided navigation for snake robots](#). *American Control Conference (ACC)*, 2020.

Thesis

- [T1] **T. Wang**. [Directional compliance in obstacle-aided navigation for snake robots](#). Master's thesis, Carnegie Mellon University.

Conference Abstracts/Posters

- [A35] **T. Wang**, M. Fernandez, G. Tunnichiffe, D. Dortilus, D. I. Goldman. [Mechanically intelligent undulatory robotic locomotion in complex aquatic environments](#). *SICB Annual Meeting*, 2025.
- [A34] J. Lin, C. Pierce, **T. Wang**, B. Chong, D. I. Goldman. [Effects of local and coupled body elasticity in overdamped undulatory locomotion](#). *SICB Annual Meeting*, 2025.

- [A33] M. Iaschi, B. Chong, D. Soto, J. Lin, **T. Wang**, D. I. Goldman. Addition of a peristaltic wave to a multilegged robot improves locomotion performance. *SICB Annual Meeting*, 2025.
- [A32] M. Fernandez, **T. Wang**, G. Tunnicliffe, D. Dortilus, D. I. Goldman. Design of an untethered underwater limbless robot for complex aquatic terrain navigation. *SICB Annual Meeting*, 2025.
- [A31] **T. Wang**, B. Chong, A. Bhumkar, V. Kojouharov, C. Pierce, D. I. Goldman. Gait design and mechanical intelligence facilitate open-loop limbless obstacle aided locomotion. *American Physical Society March Meeting*, 2024.
- [A30] V. Kojouharov, **T. Wang**, M. Fernandez, J. Maeng, D. I. Goldman. Anisotropic body compliance facilitates robotic sidewinding in complex environments. *American Physical Society March Meeting*, 2024.
- [A29] N. Mankame, **T. Wang**, M. Fernandez, C. Pierce, D. I. Goldman. Mechanical intelligence facilitates limbless locomotion in cluttered aquatic environments. *American Physical Society March Meeting*, 2024.
- [A28] B. Chong, D. Luo, **T. Wang**, G. Margolis, Z. Xu, M. Iaschi, P. Agrawal, M. Soljacic, D. I. Goldman. Geometry of contact: contact planning for multi-legged robots via spin models. *American Physical Society March Meeting*, 2024.
- [A27] **T. Wang**. Mechanical intelligence in undulatory locomotors. *Gordon Research Conference: Robotics*, 2024.
- [A26] **T. Wang**. Mechanical intelligence in undulatory locomotors. *Gordon Research Seminar: Robotics*, 2024.
- [A25] **T. Wang**, N. Mankame, A. Bhumkar, V. Kojouharov, C. Pierce, D. I. Goldman. Physical intelligence aids limbless locomotion in cluttered aquatic environments. *SICB Annual Meeting*, 2024.
- [A24] B. Chong, J. He, K. Diaz, **T. Wang**, D. Irvine, D. Soto, Y. Ozkan-Aydin, G. Blekherman, D. I. Goldman. Physical intelligence in centipede limbs facilitate reliable locomotion on rugose terrain. *SICB Annual Meeting*, 2024.
- [A23] **T. Wang**, C. Pierce, V. Kojouharov, K. Diaz, B. Chong, H. Lu, D. I. Goldman. Lattice transport via mechanical intelligence in undulatory locomotors. *American Physical Society March Meeting*, 2023.
- [A22] V. Kojouharov, **T. Wang**, C. Pierce, K. Diaz, B. Zhong, D. I. Goldman. Compliant cable-driven limbless robot for complex terrain navigation. *American Physical Society March Meeting*, 2023.
- [A21] J. He, B. Chong, S. Li, E. Erickson, K. Diaz, **T. Wang**, D. Soto, D. I. Goldman. Terrestrial swimming in multilegged robots. *American Physical Society March Meeting*, 2023.
- [A20] B. Chong, J. He, D. Soto, **T. Wang**, Daniel Irvine, Daniel I. Goldman. A Shannon-inspired framework for multi-legged matter transport. *American Physical Society March Meeting*, 2023.
- [A19] **T. Wang**, V. Kojouharov, C. Pierce, K. Diaz, B. Chong, V. Zborovsky, D. I. Goldman. Robophysical modeling reveals the role of passive body mechanics in *C. elegans* locomotion. *SICB Annual Meeting*, 2023.
- [A18] V. Kojouharov, **T. Wang**, C. Pierce, K. Diaz, B. Chong, V. Zborovsky, D. Soto, D. I. Goldman. Bilateral actuation mechanism for complex terrain navigation in limbless robots. *SICB Annual Meeting*, 2023.
- [A17] B. Chong, J. He, S. Li, E. Erickson, K. Diaz, **T. Wang**, D. Soto, D. I. Goldman. Self-propulsion via slipping: frictional swimming in multi-legged locomotors. *SICB Annual Meeting*, 2023.
- [A16] D. Soto, E. Erickson, K. Diaz, **T. Wang**, V. Kojouharov, D. I. Goldman. Novel terradynamic interactions in myriapod locomotion in obstacle-rich environments. *SICB Annual Meeting*, 2023.
- [A15] **T. Wang**, V. Kojouharov and D. I. Goldman. A novel limbless robot for complex terrain navigation via passive mechanical interactions. *GT IRIM Robotics Research Showcase*, 2022. **Best Poster Award**
- [A14] **T. Wang**, D. Z. Rocklin, D. L. Hu and D. I. Goldman. Experiment and analysis of limbless robot locomotion in heterogeneous environment from a macroscopic perspective. *GT IRIM Robotics Research Showcase*, 2022.
- [A13] **T. Wang**, B. Chong, Y. Deng, R. Fu, H. Choset, D. I. Goldman. Worm omega turn modeling and its limbless robot implementation via geometric mechanics. *American Physical Society March Meeting*, 2022.
- [A12] J. He, **T. Wang**, B. Chong, K. Diaz, E. Erickson, D. I. Goldman. Mismatch of body undulation and limb waves enables robust centipede locomotion. *American Physical Society March Meeting*, 2022.
- [A11] S. Li, **T. Wang**, V. Kojouharov, D. I. Goldman, D. Z. Rocklin, Y. Ozkan-Aydin, E. Aydin. Robotic swimming in curved space via geometric phase. *American Physical Society March Meeting*, 2022.
- [A10] E. Erickson, K. Diaz, **T. Wang**, B. Chong, J. He, D. I. Goldman. Gait transitions in centipede locomotion on complex terrains. *SICB Annual Meeting*, 2022.
- [A9] **T. Wang**, M. C. Maisonneuve, K. Diaz, P. E. Schiebel, D. I. Goldman. Complex terrain navigation via passive mechanical interactions in a novel limbless robot. *SICB Annual Meeting*, 2022.
- [A8] **T. Wang**, B. Chong, J. He, K. Diaz, E. Erickson, D. I. Goldman. Robophysical modeling of the coordination between body undulation and leg movement in centipedes. *SICB Annual Meeting*, 2022.
- [A7] B. Chong, **T. Wang**, E. Erickson, P. J. Bergmann, D. I. Goldman. Body-leg coordination in lizard locomotion along the body elongation and limb reduction continuum. *SICB Annual Meeting*, 2022.
- [A6] **T. Wang**, B. Lin, B. Chong, J. Whitman, M. Travers, D. I. Goldman, H. Choset, G. Blekherman. Reconstruction of Backbone Curves for 3-D Locomotion of Limbless Robots. *American Physical Society March Meeting*, 2021.
- [A5] **T. Wang**, B. Chong, K. Diaz, J. Whitman, H. Lu, M. Travers, D. I. Goldman and H. Choset. A Biologically Inspired Omega-Shaped Turning Gait for Elongated Limbless Robots. *American Physical Society March Meeting*, 2021.
- [A4] **T. Wang**, B. Chong, K. Diaz, J. Whitman, H. Lu, M. Travers, D. I. Goldman and H. Choset. The omega turn: a biologically-inspired turning strategy for elongated limbless robots. *Workshop: Robotics-Inspired Biology in 2020 IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2020.

- [A3] **T. Wang**, J. Whitman, M. Travers, and H. Choset. Directional compliance in snake robot obstacle-aided locomotion. *American Physical Society March Meeting*, 2020.
- [A2] K. Diaz, B. Chong, **T. Wang**, K. Bates, J. Ding, G. Sartoretti, H. Lu, H. Choset, D. I. Goldman. Steering and turning control of *C. elegans*. *American Physical Society March Meeting*, 2020.
- [A1] K. Diaz, **T. Wang**, B. Chong, J. Ding, H. Lu, G. Sartoretti, H. Choset, D. I. Goldman. Steering behaviors of *C. elegans* locomotion in heterogeneous environments. *SICB Annual Meeting*, 2020.

Patents

- [P3] **T. Wang**, M. Fernandez, and D. I. Goldman, Compact buoyancy control assembly for underwater robotic systems or equipment. *US Patent (filed 2024)*.
- [P2] **T. Wang**, V. Kojouharov, and D. I. Goldman, Devices and systems for locomoting diverse terrain and methods of use. *US Patent (filed 2022)*.
- [P1] G. Gu, L. Dong, **T. Wang**, and X. Zhu. [A kind of device and its application method of the control of 3D printing device location](#). *CN108081596A*, 2017.

FELLOWSHIPS AND AWARDS

| | |
|--|------------------------|
| Georgia Tech George W. Woodruff School of Mechanical Engineering Ph.D. Research Excellence Award | 2025 |
| NSF CPS (Cyber-Physical Systems) Rising Star | 2025 |
| APS FGSA Graduate Research Excellence Travel Award | 2025 |
| Topping Fellowship for Research Excellence | 2023, 2024, 2025 |
| Georgia Tech Center for Promoting Inclusion and Equity in Science Research Experience Award | 2024 |
| Georgia Tech IRIM Robotics Research Showcase Best Poster Award | 2022 |
| Robotics: Science and Systems (RSS) Best Paper Finalist ([C5]) | 2021 |
| SJTU Academic Excellence Scholarship | 2015, 2016, 2017, 2018 |
| Silver Medal in Advanced Vision Challenge, RoboCup China Open | 2016 |
| Covidien Scholarship | 2014 |

INVITED TALKS

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|---|----------|
| CMU Safe AI Lab | Apr 2024 |
| Seattle Robotics Society | Jun 2023 |
| NSF Physics of Living Systems (PoLS) Seminar Series | Oct 2022 |
| Georgia Tech RoboGrads Student Seminar Series | Apr 2022 |
| NSF Physics of Living Systems (PoLS) Seminar Series | Feb 2022 |

TEACHING EXPERIENCE

| | |
|--|-------------|
| SJTU VM467 Introduction to Robotics | Spring 2018 |
| Teaching Assistant | |
| Instructor: Prof. Yu Zheng | |
| SJTU VE216 Signal and System | Spring 2017 |
| Teaching Assistant | |
| Instructor: Prof. Mohamed Atef | |

ACADEMIC ACTIVITIES AND SERVICES

Workshop Organizer

- *Towards Agility and Robustness: Mechanical Intelligence in Robotics, Biology, and Smart Materials*, IEEE International Conference on Robotics and Automation (ICRA), Atlanta, USA, May 2025. [Link](#)
- *Agile Movements II: Animal Behavior, Biomechanics, and Robot Devices*, IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan, May 2024. [Link](#)
- *Agile Movements: Animal Behavior, Biomechanics, and Robot Devices*, IEEE International Conference on Robotics and Automation (ICRA), London, the United Kingdom, May 2023. [Link](#)
- *Robophysics Bootcamp*, NSF Physics of Living System Student Research Network, Atlanta, GA, July 2024.

Conference Chair

- **Discussion Leader**, Session “Improved Performance Due to a Combination of Hard and Soft Elements”, Gordon Research Seminar, Ventura, CA, United States, January 2024.

Reviewer (Journals)

The International Journal of Robotics Research (IJRR)
IEEE Transactions on Robotics (T-RO)
IEEE Robotics & Automation Letters (RA-L)
Soft Robotics
Nonlinear Dynamics

Reviewer (Conferences)

IEEE International Conference on Intelligent Robots and Systems (IROS)
IEEE Conference on Robotics and Automation (ICRA)
American Control Conference (ACC)

PRESS

Worms Inspire Wiggly Robots That Navigate All Landscapes (by *Georgia Tech Research News*) 2024
[Article link](#) [YouTube link](#)

Scurrying Centipedes Inspire Many-Legged Robots That Can Traverse Difficult Landscapes (by *Georgia Tech Research News*) 2023
[Article link](#) [YouTube link](#)

Robotic Motion in Curved Space Defies Standard Laws of Physics (by *Georgia Tech Research News*) 2022
[Article link](#) [YouTube link](#)

Tiny Limbs and Long Bodies: Coordinating Lizard Locomotion (by *Georgia Tech Research News*) 2022
[Article link](#) [YouTube link](#)

These Search and Rescue Robots Could Save Your Life (by *Freethink*) 2019
[Article link](#) [YouTube link](#)

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