

Mengxue Hou

CONTACT INFORMATION	226B Cushing Hall of Engineering, University of Notre Dame, IN 46556	mhou@nd.edu, (574) 631-8015 http://mengxuehou.com
RESEARCH INTERESTS	Robotics, Autonomy, AI, Machine Learning, Control Theory, Human Robot Teaming	
APPOINTMENTS	University of Notre Dame , South Bend, IN, USA	Jul. 2023 - present
	Tenure-track Assistant Professor, Electrical Engineering	
	Purdue University , West Lafayette, IN	Aug. 2022 - Jul. 2023
	Lillian Gilbreth Postdoctoral Fellow, College of Engineering Advisors: Prof. Shaosuai Mou, Prof. Shreyas Sundaram	
EDUCATION	Georgia Institute of Technology , Atlanta, GA, USA	Aug. 2016 - Jul. 2022
	Ph.D., Electrical and Computer Engineering	
	Minor, Mathematics	
	Thesis: Mori-Zwanzig formalism based reduced-order modeling for decision-making in marine autonomy	
	Committee: Prof. Fumin Zhang(Advisor), Prof. Catherine R. Edwards, Prof. Haomin Zhou, Prof. Ye Zhao, Prof. Enlu Zhou, Prof. Seth Hutchinson	
	Shanghai Jiao Tong University , Shanghai, China	Sept 2012 - June 2016
	B.S., Electrical Engineering	
HONORS AND AWARDS	1 2023 CPS Rising Star, University of Virginia, April 2023	
	2 Lillian Gilbreth postdoctoral fellowship, Purdue University, August 2022.	
	3 Best student paper/poster award, MTS/IEEE OCEANS' 19, Marseille, France, June 2019 (flagship conference in ocean engineering).	
	4 Chiang Chen overseas graduate fellowship from Chiang Chen Industrial Charity Foundation, Hong Kong, China, 2015. (1 of 10 awardees in China)	
PUBLICATIONS	Journal publications	
	J8 Mengxue Hou , Enlu Zhou and Fumin Zhang, "Mori-Zwanzig Approach for Belief Abstraction with Application to Belief Space Planning," in <i>Autonomous Robots</i> , under review. preprint.	
	J7 Xueming Zhang, Mengxue Hou and Zhongsheng Hou, "Data-Driven High-Order Point-to-Point ILC With Higher Computational Efficiency," in <i>IEEE Transactions on Automation Science and Engineering</i> , pp. 1-16. DOI: 10.1109/TASE.2023.3321038	
	J6 Mengxue Hou , Qiuyang Tao and Fumin Zhang, "Human Pointing Motion during Interaction with an Autonomous Blimp," in <i>Scientific Reports</i> , 12, 11402, 2022. DOI: 10.1038/s41598-022-15016-w	
	J5 Yingke Li, Mengxue Hou , Enlu Zhou and Fumin Zhang, "Dynamic Event-triggered Integrated Task and Motion Planning for Process-aware Source Seeking," in <i>Autonomous Robots</i> , under review.	
	J4 Haoyan Zhai, Mengxue Hou , Fumin Zhang and Haomin Zhou, "Method of Evolving Junction on Optimal Path Planning in Flow Fields," in <i>Autonomous Robots</i> , 1-19, 2022. DOI: 10.1007/s10514-022-10058-5	

- J3 Meriam Ouerghi, **Mengxue Hou** and Fumin Zhang, “Laplacian Regularized Motion Tomography for Underwater Vehicle Flow Mapping with Sporadic Localization Measurements”, in *Autonomous Robots*, under review. [preprint](#).
- J2 **Mengxue Hou**, Sungjin Cho, Haomin Zhou, Catherine R. Edwards and Fumin Zhang, “Bounded Cost Path Planning for Underwater Vehicles Assisted by a Time-invariant Partitioned Flow Field Model,” in *Frontiers in Robotics and AI*, 8, 2021. DOI: 10.3389/frobt.2021.575267
- J1 Meriam Ouerghi, Sean Maxon, **Mengxue Hou** and Fumin Zhang, “Improved Trajectory Tracing of Underwater Vehicles for Flow Field Mapping,” in *International Journal of Intelligent Robotics and Applications*, 1-17, Jul. 2021, pp. 1-17. DOI: 10.1007/s41315-021-00189-w

Conference proceedings

- C18 Ruochu Yang, **Mengxue Hou**, Junkai Wang, and Fumin Zhang, “OceanChat: Piloting Autonomous Underwater Vehicles in Natural Language”, in *2023 IEEE International Conference on Robotics and Automation (ICRA)*, under review, [preprint](#)
- C17 Ruochu Yang, **Mengxue Hou**, Chad Lembke, Catherine R. Edwards and Fumin Zhang, “Real-time Autonomous Glider Navigation Software”, in *Proc. of MTS/IEEE OCEANS’ 23*, Limerick, UK, Jun. 2023, in press, [preprint](#)
- C16 Shaojun Ma, **Mengxue Hou**, Xiaojing Ye, and Haomin Zhou, “High-dimensional Optimal Density Control with Wasserstein Metric Matching”, in *2023 Conference on Decision and Control (CDC)*, accepted [preprint](#)
- C15 **Mengxue Hou**, Yingke Li, Fumin Zhang, Shreyas Sundaram and Shaoshuai Mou, “An Interleaved Algorithm for Integration of Robotic Task and Motion Planning”, in *2023 American Control Conference (ACC)*, San Diego, CA, USA, Jun. 2023, pp. 539-544, DOI: 10.23919/ACC55779.2023.10156651.
- C14 Yingke Li, **Mengxue Hou**, Enlu Zhou and Fumin Zhang, “Dynamic Event-triggered Integrated Task and Motion Planning for Process-aware Source Seeking,” in *2023 American Control Conference (ACC)*, San Diego, CA, USA, Jun. 2023, pp. 527-532, DOI: 10.23919/ACC55779.2023.10156291.
- C13 Ruochu Yang, **Mengxue Hou**, Chad Lembke, Catherine R. Edwards and Fumin Zhang, “Anomaly Detection of Underwater Gliders Verified by Deployment Data”, in *2023 IEEE Underwater Technology (UT)*, Tokyo, Japan, Mar. 2023, pp. 1-10, DOI: 10.1109/UT49729.2023.10103445
- C12 **Mengxue Hou**, Tony X. Lin, Haomin Zhou, Wei Zhang, Catherine R. Edwards and Fumin Zhang, “Belief Space Partitioning for Symbolic Motion Planning, ” in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, Xi’an, China, Jun. 2021, pp. 8245-8251. DOI: 10.1109/ICRA48506.2021.9561121
- C11 Sravya Kondrakunta, Venkatsampath R. Gogineni, Michael Cox, Demetris Coleman, Xiabao Tan, Tony Lin, **Mengxue Hou**, Fumin Zhang, Frank McQuarrie, and Catherine R. Edwards, “The Rational Selection of Goal Operations and the Integration of Search Strategies with Goal-driven Marine Autonomy,” in *Proceedings of the Ninth Annual Conference on Advances in Cognitive Systems*, 2021.
- C10 Qiuyang Tao, **Mengxue Hou** and Fumin Zhang, “Modeling and Identification of Coupled Translational and Rotational Motion of Underactuated Indoor Miniature Autonomous Blimps,” in *2020 16th International Conference on Control, Automation, Robotics and Vision (ICARCV)*, Dec. 2020, pp. 339-344. DOI: 10.1109/ICARCV50220.2020.9305371
- C9 Tony X. Lin, **Mengxue Hou**, Catherine R. Edwards, Michael Cox and Fumin Zhang, “Bounded Cost HTN Planning for Marine Autonomy,” in *Global Oceans*

2020: *Singapore – U.S. Gulf Coast*, Oct. 2020, pp. 1-6.
 DOI: 10.1109/IEEECONF38699.2020.9389201

- C8 Ziqiao Zhang, **Mengxue Hou**, Fumin Zhang, and Catherine R. Edwards, “An LSTM based Kalman Filter for Spatio-temporal Ocean Currents Assimilation,” in *Proc. of ACM International Conference on Underwater Networks and Systems*, Atlanta, US, Oct. 2019, pp. 1-7. DOI: 10.1145/3366486.3366522
- C7 **Mengxue Hou**, Haoyan Zhai, Haomin Zhou and Fumin Zhang, “Partitioning Ocean Flow Field for Underwater Vehicle Path Planning,” in *Proc. of MTS/IEEE OCEANS’ 19*, Marseille, France, Jun. 2019, pp. 1-8.
 DOI: 10.1109/OCEANSE.2019.8867327 (**best student paper/poster award**)
- C6 **Mengxue Hou**, Qiuyang Tao, Paul Varnell and Fumin Zhang, “Modeling Pointing Tasks in Human-Blimp Interactions,” in *Proc. of the 3rd IEEE Conference on Control Technology and Applications (CCTA)*, Hong Kong, China, Aug. 2019, pp. 73-78. DOI: 10.1109/CCTA.2019.8920528
- C5 **Mengxue Hou**, Shijie Liu, Fumin Zhang and Catherine R. Edwards, “Path Tracking Error Analysis for Underwater Glider Navigation in a Spatially and Temporally Varying Flow Field”, in *Proc. of MTS/IEEE OCEANS’ 18*, Charleston, US, Oct. 2018, pp. 1-6. DOI: 10.1109/OCEANS.2018.8604585
- C4 **Mengxue Hou**, Shijie Liu, Fumin Zhang and Catherine R. Edwards, “A Combined Path Planning and Path Following Method for Underwater Glider Navigation in a Strong, Dynamic Flow Field”, in *Proc. of MTS/IEEE OCEANS’ 18*, Kobe, Japan, May. 2018, pp. 1-8. DOI: 10.1109/OCEANSKOBE.2018.8559348
- C3 Qiuyang Tao, Jaeseok Cha, **Mengxue Hou** and Fumin Zhang, “Parameter Identification of Blimp Dynamics through Swinging Motion”, in *Proc. of International Conference on Control, Automation, Robotics and Vision (ICRAV)*, Singapore, Nov. 2018, pp. 1186-1191. DOI: 10.1109/ICARCV.2018.8581376
- C2 **Mengxue Hou** and Shangtai Jin, “Simulation Comparison among Three Data-Driven Control Methods for the Planar Manipulator”, in *Proc. of 10th Asian Control Conference (ASCC)*, Sabah, Malaysia, May. 2015, pp. 1-6.
 DOI: 10.1109/ASCC.2015.7244440
- C1 Shangtai Jin and **Mengxue Hou**, “An Improved Full-Form-Dynamic-Linearization based MFAC for a Class of Nonlinear Systems”, in *Proc. of 34th Chinese Control Conference (CCC)*, Hangzhou, China, Jul. 2015, pp. 3045-3050.
 DOI: 10.1109/ChiCC.2015.7260108

TEACHING
 EXPERIENCE

- Course Instructor**, EE 20221 Spring 2024
 Signal and Information Systems,
 Electrical Engineering, University of Notre Dame
- Course Instructor**, EE 67074 Fall 2023
 AI Planning: from Graph Search to Reinforcement Learning,
 Electrical Engineering, University of Notre Dame
- Course Instructor**, Vertically Integrated Projects (VIP), Fall 2018 - Spring 2019
 Electrical and Computer Engineering, Georgia Tech
- Course Instructor**, Summer Undergraduate Research in Summer 2019
 Engineering/Sciences (S.U.R.E.),
 Electrical and Computer Engineering, Georgia Tech
- Teaching Assistant**, Introduction to Signal Processing, Fall 2016 - Summer 2017
 Electrical and Computer Engineering, Georgia Tech

SERVICE

- Editor for Journal of Intelligent & Robotic Systems (JINT)

- Reviewer for IEEE Transactions on Automatic Control, IEEE Transaction on Cybernetics, IEEE Transaction on Robotics, IEEE Journal of Oceanic Engineering, IEEE Transactions on Control of Network Systems, Autonomous Robots, and IEEE Robotics and Automation Letters.
- Reviewer for International Conference on Underwater Networks & systems (WUWNet), MTS/IEEE OCEANS, International Conference on Robotics and Automation (ICRA), Conference on Control Technology and Applications (CCTA), American Control Conference (ACC) and Conference on Decision and Control (CDC).