

## Mengxue (Mona) Hou

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RESEARCH INTERESTS	<b>Robotic Autonomy:</b> Integrated Task and Motion Planning, Data-driven Filtering and Control, Data Assimilation for Environmental State Estimation <b>Shared Autonomy:</b> Identification of Human Intention, Synergistic Planning for Human-robot Teams	
EDUCATION	<b>Georgia Institute of Technology</b> , Atlanta, GA, USA Ph.D., Electrical and Computer Engineering Aug. 2016 - Jul. 2022 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 <b>Shanghai Jiao Tong University</b> , Shanghai, China B.S., Electrical Engineering Sept 2012 - June 2016	
RESEARCH EXPERIENCE	Purdue University, West Lafayette, IN Lillian Gilbreth Postdoctoral Fellow, College of Engineering Aug. 2022 - present Advisors: Prof. Shaosuai Mou, Prof. Shreyas Sundaram Georgia Institute of Technology, Atlanta, GA Research Assistant, Electrical and Computer Engineering, Aug. 2016 - Jul. 2022 Advisor: Prof. Fumin Zhang	
HONORS AND AWARDS	1 <a href="#">Best student paper/poster award</a> , MTS/IEEE OCEANS' 19, Marseille, France, June. 2019 (flagship conference in ocean engineering). 2 Chiang Chen overseas graduate fellowship from Chiang Chen Industrial Charity Foundation, Hong Kong, China, 2015. (1 of 10 awardees in China)	
PUBLICATIONS	<b>Journal publications</b> 1 <b>Mengxue Hou</b> , Qiuyang Tao and Fumin Zhang, "Human Pointing Motion during Interaction with an Autonomous Blimp," in <i>Scientific Reports</i> , 12, 11402, 2022. DOI: <a href="https://doi.org/10.1038/s41598-022-15016-w">10.1038/s41598-022-15016-w</a> . 2 Haoyan Zhai, <b>Mengxue Hou</b> , 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: <a href="https://doi.org/10.1007/s10514-022-10058-5">10.1007/s10514-022-10058-5</a> 3 Meriam Ouerghi, <b>Mengxue Hou</b> and Fumin Zhang, "Laplacian Regularized Motion Tomography for Underwater Vehicle Flow Mapping with Sporadic Localization Measurements", in <i>Autonomous Robots</i> , under review. <a href="#">preprint</a> . 4 <b>Mengxue Hou</b> , 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 <i>Frontiers in Robotics and AI</i> , 8, 2021. DOI: <a href="https://doi.org/10.3389/frobt.2021.575267">10.3389/frobt.2021.575267</a> 5 Meriam Ouerghi, Sean Maxon, <b>Mengxue Hou</b> and Fumin Zhang, "Improved Trajectory Tracing of Underwater Vehicles for Flow Field Mapping," in <i>International Journal of Intelligent Robotics and Applications</i> , 1-17, Jul. 2021, pp. 1-17. DOI: <a href="https://doi.org/10.1007/s41315-021-00189-w">10.1007/s41315-021-00189-w</a>	

- 6 **Mengxue Hou**, Enlu Zhou and Fumin Zhang, “Mori-Zwanzig Formalism based Belief Abstraction for Uncertainty-aware Decision-making,” in preparation for submission.

#### Conference proceedings

- 1 **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)*, under review.
- 2 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)*, under review
- 3 **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](https://doi.org/10.1109/ICRA48506.2021.9561121)
- 4 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. in press.
- 5 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](https://doi.org/10.1109/ICARCV50220.2020.9305371).
- 5 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](https://doi.org/10.1109/IEEECONF38699.2020.9389201).
- 6 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](https://doi.org/10.1145/3366486.3366522)
- 7 **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](https://doi.org/10.1109/OCEANSE.2019.8867327) (best student paper/poster award)
- 8 **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](https://doi.org/10.1109/CCTA.2019.8920528)
- 9 **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](https://doi.org/10.1109/OCEANS.2018.8604585)
- 10 **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](https://doi.org/10.1109/OCEANSKOBE.2018.8559348)
- 11 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](https://doi.org/10.1109/ICARCV.2018.8581376)

- 12 **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](https://doi.org/10.1109/ASCC.2015.7244440)

- 13 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](https://doi.org/10.1109/ChiCC.2015.7260108)

TEACHING EXPERIENCE	<p><b>Course Instructor</b>, Vertically Integrated Projects (VIP),      Fall 2018 - Spring 2019 Electrical and Computer Engineering, Georgia Tech</p> <p><b>Course Instructor</b>, Summer Undergraduate Research in      Summer 2019 Engineering/Sciences (S.U.R.E.), Electrical and Computer Engineering, Georgia Tech</p> <p><b>Teaching Assistant</b>, Introduction to Signal Processing,      Fall 2016 - Summer 2017 Electrical and Computer Engineering, Georgia Tech</p>
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SERVICE	<ul style="list-style-type: none"> <li>• Reviewer for IEEE Transactions on Automatic Control, IEEE Journal of Oceanic Engineering, IEEE Transactions on Control of Network Systems, Autonomous Robots, and IEEE Robotics and Automation Letters.</li> <li>• Reviewer for International Conference on Underwater Networks &amp; 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).</li> </ul>
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