

# CONG WEI

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## RESEARCH INTERESTS

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Nonlinear Control; Marine Robotics; Ocean Sampling; Multi-agent Control; Data-Driven Robotics; Navigation

## EDUCATION

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<b>University of Delaware, USA</b> Doctor of Philosophy, Advisor: Herbert G. Tanner Department of Mechanical Engineering	<i>09/2016 - 08/2021</i>
<b>Harbin Engineering University, China</b> Master of Engineering, Advisor: Ye Li The College of Shipbuilding Engineering	<i>09/2012 - 06/2014</i>
<b>Ningbo University, China</b> Bachelor of Engineering The Faculty of Maritime and Transportation	<i>09/2008 - 06/2012</i>

## WORK EXPERIENCE

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<b>Old Dominion University</b> Assistant Professor, Department of Mechanical and Aerospace Engineering	<i>07/2023 - Present</i>
<b>University of Maryland, College Park, USA</b> Postdoctoral Associate, Maryland Robotics Center, Institute for Systems Research	<i>08/2021 - 07/2023</i>
<b>University of Delaware, USA</b> Research Assistant, Department of Mechanical Engineering Teaching Assistant	<i>07/2016 - 08/2021</i> <i>02/2020 - 05/2020</i>
<b>Shanghai Jiao Tong University, China</b> Research Assistant, School of Naval Architecture, Ocean & Civil Engineering	<i>09/2014 - 06/2016</i>
<b>Harbin Engineering University, China</b> Research Assistant, The College of Shipbuilding Engineering	<i>09/2012 - 06/2014</i>

## PUBLICATIONS

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### Journal Articles

- **Cong Wei**, Eric Berkenpas, Derek A. Paley, Distributed estimation of the pelagic scattering layer using multiple buoyancy controlled underwater vehicles, *Ocean Engineering*, Volume 307, 2024, 118076.
- **Cong Wei**, Chuchu Chen and H. G. Tanner, "Navigation Functions with Moving Destinations and Obstacles" in *Autonomous Robots*, 2023. DOI: 10.1007/s10514-023-10088-7.
- **Cong Wei** and H. G. Tanner, "Synchronization of Geophysically Driven Oscillators With Short-Range Interaction," in *IEEE Transactions on Automatic Control*, vol. 67, no. 3, pp. 1135-1146, March 2022.
- X Yu, Hsieh, M Ani, **Cong Wei**, Herbert G Tanner, "Synchronous Rendezvous for Networks of Marine Robots in Large Scale Ocean Monitoring," *Frontiers in Robotics and AI* 6, 76.
- Ye Li, **Cong Wei**, Qi Wu, Pengyun Chen, Yanqing Jiang, Yiming Li. Study of 3 Dimension Trajectory Tracking of Underactuated Autonomous Underwater Vehicle. *Ocean Engineering*, 105 (2015) 270-274.

### Peer reviewed Conference Proceedings

- Rob Stuart, Alex Riehl, Adam Porter, Sam Zimmerman, Nathan Hanks, Kirstie Moore, Alexander Bochdansky, **Cong Wei**, and Krishnanand Kaipa" Design and Depth Tracking of an Underwater Quadrotor-Float for Ocean Exploration Tasks," *OCEANS 2024 - Halifax*, Halifax, Canada (to appear).

- **Wei, C.**, Berkenpas, E. J., Shepard, C. M., Bevans, D., Laferriere, A. B., and Thode, A. "Ocean flow observation from inter-platform measurement for Lagrangian floats," OCEANS 2024 - Halifax, Halifax, Canada (to appear).
- Logan E. Beaver, **Cong Wei**, Wei-Kuo Yen, "Kinodynamic Motion Planning for a System with Squid Dynamics," 15<sup>th</sup> Conference on Control Applications in Marine Systems, Robotics and Vehicles (to appear).
- **Wei, C.**, Paley, D.A. (2024). Distributed Estimation of the Pelagic Scattering Layer Using a Buoyancy Controlled Robotic System. In: Blasch, E., Darema, F., Aved, A. (eds) Dynamic Data Driven Applications Systems. DDDAS 2022. Lecture Notes in Computer Science, vol 13984. Springer, Cham.
- **Wei, C.**, Paley, D.A. Distributed Spacing Control for Multiple, Buoyancy-Controlled Underwater Robots. In: LaValle, S.M., O’Kane, J.M., Otte, M., Sadigh, D., Tokekar, P. (eds) Algorithmic Foundations of Robotics XV. WAFR 2022. Springer Proceedings in Advanced Robotics, vol 25. Springer, Cham.
- **Cong Wei**, H. G. Tanner and M. Ani Hsieh, Nonlinear Synchronization Control for Short-Range Mobile Sensors Drifting in Geophysical Flows, In Proceedings of the IEEE International Conference on Robotics and Automation, 2020, pp. 907-913.
- **Cong Wei**, HG Tanner, X Yu, MA Hsieh, Low-range interaction periodic rendezvous along Lagrangian coherent structures. In Proceedings of the IEEE American Control Conference, pp. 4012-4017, July, 2019.
- **Cong Wei**, Xi Yu, Herbert G Tanner, M Ani Hsieh. Synchronous Rendezvous for Networks of Active Drifters in Gyre Flows. In: Correll, N., Schwager, M., Otte, M. (eds) Distributed Autonomous Robotic Systems. Springer Proceedings in Advanced Robotics, vol 9. Springer, Cham.
- **Cong Wei**, Caili Li, and Herbert G. Tanner. Synchronous Rendezvous for Periodically Orbiting Vehicles with Very-Low-Range Interactions. In Proceedings of the IEEE American Control Conference, pp. 1641–1646, June, 2018.

#### PhD Thesis

- **Cong Wei**, "Synchronization for Large Network of Marine Active Drifting Sensors through Periodic Intermittent Rendezvous," PhD Dissertation, University of Delaware, 2021.

#### PROJECTS INVOLVED

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<b>Enhancing the Detection and Surveillance of Harmful Algal Blooms by Integrating Near-Real-Time Satellite Monitoring with In-Situ Adaptive Automated Sampling</b>	<i>01/2024 - 12/2024</i>
Coastal Adaptation and Resilience Multidisciplinary Action (CARMA) Seed Funding program	
<b>Distributed Control and Estimation for Sonar Performance Prediction by Multiple Autonomous Underwater Vehicles</b>	<i>08/2022 - 07/2023</i>
Northrop Grumman-UMD seed grant	
<b>Navigation in Dynamic Environment</b>	<i>05/2020 - 05/2021</i>
Defense Threat Reduction Agency (DTRA)	
<b>Synchronous Rendezvous in Geophysical Flows</b>	<i>09/2016 - 05/2020</i>
Office of Naval Research (ONR) in cooperation with the University of Pennsylvania	

#### RESEARCH GROUP

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Farima Hajiahmadi, PhD student

#### TEACHING EXPERIENCE

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<b>Old Dominion University, USA</b>	<i>Fall 2023</i>
Instructor, MAE 436 Dynamic Systems and Control	
<b>University of Maryland, College Park, USA</b>	<i>Spring 2023</i>
Assistant Instructor, ENAE 646 Advanced Dynamics	
<b>University of Maryland, College Park, USA</b>	<i>Spring 2023</i>
Instructor, ENAE 464 Aerospace Engineering Laboratory	
<b>University of Maryland, College Park, USA</b>	<i>Spring 2022</i>
Assistant Instructor, ENAE 743 Applied Nonlinear Control of Aerospace Systems	

## MENTORING EXPERIENCE

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- Old Dominion University** *Fall 2023, Summer 2024*  
Project Design and Management: AUV Underwater Vehicles, MAE 434w
- Old Dominion University** *Fall 2023*  
Project Design and Management: Crane Barge Automation, MAE 434w
- University of Maryland, College Park, USA** *Fall 2022*  
Autonomous Path Planning for Logistic Robots, ENAE100

## SERVICES

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### PhD Dissertation Committee

- Committee member for Mehmet Simsek from the Department of Mechanical and Aerospace Engineering at Old Dominion University

### Reviewing Activities for Journals

- Automatica
- IEEE Transactions on Automatic Control (TAC)
- Neurocomputing
- Ocean Engineering (OE)
- IEEE Control Systems Magazine (CSM)
- Journal of Guidance, Control, and Dynamics (JGCD)
- IEEE Robotics and Automation Letters (RAL)

### Reviewing Activities for Conferences

- Conference on Decision and Control (CDC)
- American Control Conference (ACC)
- Mediterranean Conference on Control and Automation (MED)
- Modeling, Estimation and Control Conference (MECC)

## HONORS & FELLOWSHIPS

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- 2nd in HACKtheMACHINE Unmanned Challenge 3 held by U.S. Navy *Nov/2021 - Dec/2021*
- MRC Postdoctoral Fellowship *Aug/2021 - Aug/2022*
- Alumni Fellowship of the University of Delaware *Aug/2016 - Dec/2016*

## INVITED TALKS & PRESENTATIONS

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**Underwater Adaptive Sampling Using Drifting Vehicles**  
Old Dominion University, Oct/2023

**Coordination Control for Ocean-going Marine Robots**  
Rochester Institute of Technology, March/2023

**Multi-agent Marine Robotic Coordination for Environmental Monitoring**  
New Jersey Institute of Technology, Feb/2023

**Distributed Spacing Control for Multiple, Buoyancy-controlled Underwater Robots**  
Maryland Robotics Center Research Symposium, May/2022

**Synchronization of Active Sensors in Environment Dominant Field**  
University of California Riverside, May/2021

## **Synchronization of Geophysically-Driven Oscillators with Short-Range Interaction**

University of Hawaii at Mānoa, May/2021

### **POSTER**

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**Cong Wei**, Xi Yu, Herbert G Tanner, M Ani Hsieh. Distributed Synchronous Rendezvous for Networks of Mobile Agents. Dynamics Days Europe 2020.