LIN ZHAO

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EDUCATION

University of Rhode Island, USA — Aug. 2019 - Present
Ph.D. Candidate in Ocean Engineering — GPA: 3.89/4.0
Advisor: Prof. Mingxi Zhou
Committee: Prof. Chris Roman, Prof. Brice Loose

University of Nevada, Las Vegas, USA — Aug. 2013 - Aug. 2015
M.S. in Mechanical Engineering
Advisor: Prof. Woosoon Yim

Zhejiang University City College (now Hangzhou City University), China — Aug. 2009 - Jun. 2013
B.E. in Mechanical & Electronic Engineering

ACADEMIC EXPERIENCE

University Rhode Island — Aug. 2019 - Present
Research Assistant, Smart Ocean System Lab — *Narragansett, RI*

- Under-ice multi-sensor SLAM:
    - Underwater vehicle system integration: ROS sensor drivers, hardware time-sync, calibration.
    - Dataset: IMU, DVL, Pressure, Stereo, Imaging Sonar, USBL.
    - Dead-reckoning: EKF odometry fused by IMU, DVL and Pressure, and DVL-aided system initialization for the dynamic environment.
    - DVL-aided VIO: sparse DVL point cloud enhances visual feature estimation within Multi-State Constraint Kalman Filter (MSCKF) framework.
    - Imaging Sonar-aided odometry: features tracking and system update within MSCKF.
- Coverage path planning and seafloor mapping using bathymetric sonar.
- Software development, maintenance and test for lab-developed Autonomous Underwater Vehicles.

Teaching Assistant — *Narragansett, RI*

- OCG110 The Ocean Planet, 2019 Fall.
- OCG123G Climate change and the oceans, 2020 Spring.
- OCG120G The World of Robots, 2023 Spring/2024 Spring

University of Nevada, Las Vegas — Aug. 2013 - Aug. 2015
Research Assistant, Intelligent Structures and Control Lab — *Las Vegas, NV*

- Path planning simulation (A*, D* Lite, Reciprocal Velocity Obstacle).
- 2D path planning integration with ground vehicle using Hokuyo Lidar.
- 3D path planning (Vector Field Histogram) development and integration with UAV using Kinect.

Teaching Assistant — *Las Vegas, NV*

- Automatic Control Laboratory, 2013 Fall/2014 Fall.
- Engineering Measurement Laboratory, 2014 Spring.

INDUSTRY EXPERIENCE

ECARX   Dec. 2018 - Aug. 2019
Algorithm Engineer   *Hangzhou, China*

- Lidar-based SLAM development and software implementation for self-driving car.

D2robot Technology   Jul. 2017 - Aug. 2018
Research & Development Engineer   *Hangzhou, China*

- **Software development**: drivers for motor and communication board.

- **Algorithm application**: visual SLAM and differential motion control.

- **Multi-sensor fusion**: calibration (cameras and Lidar), data transmission (pointcloud compression and TCP transmission) and real-time 3D dense reconstruction.

- **Medical image processing**: C-Arm imaging device calibration, vertebral contour detection from CT image.

Zhejiang Skywalker Innovation Technology   Oct. 2015 - Jun. 2017
Software Engineer   *Hangzhou, China*

- **Lidar Scanner Design (Leader)**: algorithm design to generate 2D data from a single point laser; driver development for UAV flight controller (stm32) and ROS; implemented PID controller to the rotation module; improved in structure design of the entire mechanical system.

- **Obstacle Avoidance**: 2D obstacle avoidance algorithm integration with UAV flight controller; 2D SLAM algorithm implementation on UAV with developed 2D Lidar scanner.

PUBLICATIONS

Conferences:

1. **L. Zhao**, M.Zhou, B. Loose, *Tightly-coupled Visual-DVL-Inertial Odometry for Robot-based Ice-water Boundary Exploration.* 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). 2023, Detroit, USA. code

2. **L. Zhao**, M. Zhou and B. Loose, *Towards Under-ice Sensing using a Portable ROV*, OCEANS 2022, Hampton Roads, VA, USA, 2022, pp. 1-8. (**student poster competition finalist**) code

3. E. C. Gezer, M. Zhou, **L. Zhao** and W. McConnell, *Working toward the development of a generic marine vehicle framework: ROS-MVP*, OCEANS 2022, Hampton Roads, VA, USA, 2022, pp. 1-5. code

4. E. C. Gezer, **L. Zhao**, J. Beason and M. Zhou, *Towards seafloor mapping using an affordable micro-UUV*, OCEANS 2021, San Diego, CA, USA, 2021, pp. 1-5.

5. **L. Zhao**, M. Zhou, B. Loose, V. Cousens and R. Turrisi, *Modifying an Affordable ROV for Under-ice Sensing*, OCEANS 2021, San Diego, CA, USA, 2021, pp. 1-5.

6. M. Zhou, J. Shi and **L. Zhao**, *Towards the Development of an Online Coverage Path Planner for UUV-based Seafloor Survey using an Interferometric Sonar*, IEEE/OES Autonomous Underwater Vehicles Symposium (AUV), St. Johns, NL, Canada, 2020, pp. 1-5.

7. Z. Cook, **Lin Zhao**, J. Lee and Woosoon Yim, *Unmanned aerial system for first responders*, 12th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI), Goyang, 2015, pp. 306-310. code

SKILLS

Programming:	C/C++, Python, Matlab, Arduino
Libraries:	ROS1/ROS2, OpenCV, Open3D, PCL, PyTorch
Robots:	UAV, UGV, ROV, AUV, USV
Sensors:	LiDAR, Camera, RGBD-Camera, Imaging/Bathymetric Sonar, IMU, DVL

HONORS & AWARDS

- **Student Poster Competition Finalist**, IEEE/MTS OCEANS 2022, Hampton Roads, VA. 2022
- **Academic Innovation Scholarship**, College of Engineering, Zhejiang University City College. 2013

PROFESSIONAL ACTIVITIES

Membership

- IEEE Graduate Student Member
- IEEE Robotics and Automation Society (RAS) Member
- IEEE Oceanic Engineering Society (OES) Member

Journal Review

- IEEE Systems Journal Since 2024

MENTORSHIP

The Summer Undergraduate Research Fellowship in Oceanography (SURFO)
Benjamin Ginnet (2023)

FIELD TRIPS

- Interferometric sidescan sonar test St Marys, GA, 2020
- Under-ice multi-sensor data collection in freshwater. Houghton, MI, 2021
- Under-ice multi-sensor data collection in seawater. Utqiagvik, AK, 2021

OUTREACH

Science Saturday, GSO, URI 2021/2022
Exhibits, tours and conversations centered on marine exploration, discovery, science and management