# Yaming Ou

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## EDUCATION

**Institute of Automation, Chinese Academy of Sciences (Top 69 in 2024-2025 USNews Ranking)** *Beijing,China*

*PhD, Control Science and Engineering* Sep. 2021 - Present

- **Supervisor:** Prof. Chao Zhou & Prof. Junfeng Fan
- **Research Interests:** SLAM, Multi-sensor Fusion, Robot Exploration, Marine Robot
- **PhD Project:** Dense SLAM and Autonomous Exploration Research for Underwater Robots Based on Multi-modal Information Fusion
- **Modules:** Robotics (95/100), Matrix Analysis and Applications (94/100), Deep Learning (93/100), etc.

**Southeast University (985, Double First-Class University)** *Nanjing, China*

*Bachelor of Engineering, Robot Engineering (Top 3 in China)* Sep. 2017 - Jun. 2021

- **Ranking:** 2/34
- **Modules:** Higher Mathematics (95/100), Geometry & Algebra (98/100), C++ Data Structure (98/100), etc.

## PUBLICATIONS

### *Journal Papers*

[1] **Ou Y**, Fan J, Zhou C, et al. **Structured Light-Based Underwater Collision-Free Navigation and Dense Mapping System for Refined Exploration in Unknown Dark Environments**[J]. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2024. [Link] (JCR Q1, IF 8.6)

[2] **Ou Y**, Fan J, Zhou C, et al. **Water-MBSL: Underwater Movable Binocular Structured Light-Based High-Precision Dense Reconstruction Framework**[J]. IEEE Transactions on Industrial Informatics, 2023. [Link] (JCR Q1, IF 11.7)

[3] **Ou Y**, Fan J, Zhou C, et al. **Binocular Structured Light 3-D Reconstruction System for Low-light Underwater Environments: Design, Modeling, and Laser-based Calibration**[J]. IEEE Transactions on Instrumentation and Measurement, 2023. [Link] (JCR Q1, IF 5.6)

[4] Fan J, **Ou Y***, Li X, et al. **Structured Light Vision Based Pipeline Tracking and 3D Reconstruction Method for Underwater Vehicle**[J]. IEEE Transactions on Intelligent Vehicles, 2023. [Link] (JCR Q1, IF 14.0, Corresponding Author)

[5] **Ou Y**, Fan J, et al. **Hybrid-VINS: Underwater Tightly-Coupled Hybrid Visual Inertial Dense SLAM for AUV**[J].IEEE Transactions on Industrial Electronics, 2024. (JCR Q1, IF 7.5, Major Revision)

### *Conference Papers*

[1] **Ou Y**, Zhang Z, et al. **Data Calibration Algorithm for Artificial Lateral Line Sensor of Robotic Fish on Improved LSTM**[C]//2021 40th Chinese Control Conference (CCC). IEEE, 2021. [Link]

[2] Huang Y, Li P, Yan S, **Ou Y**, et al. **Tightly-Coupled Visual-DVL Fusion For Accurate Localization of Underwater Robots**[C]//2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2023. [Link]

### *Invention Patents*

[1] Zhou C, **Ou Y**, Fan J, et al, **Underwater Mobile Dense Mapping Platform and Mapping Method Based on Binocular Structured Light.** Chinese Patent, CN117893675A. (Practical Finisher)

[2] Zhou C, **Ou Y**, Fan J, et al, **A Simultaneous Localization System and Method for Underwater Robots.** Chinese Patent, KHP2411116437.0. (Practical Finisher)

[3] Zhang Z, Zhou C, Fan J, **Ou Y**, **Bionic Lateral Line Sensor.** Chinese Patent, CN114624461B.

[4] Zhang Z, Zhou C, Fan J, ..., **Ou Y**. **Calibration Model Training Method, Device and System, Electronic Equipment and Storage Medium.** Chinese Patent, CN117634641A.

## AWARDS

2024 Outstanding Student Leader Award of UCAS (**top 2%**)
2023 Selected for experimental class of CASIA (**8/276, 5W RMB scholarships each year**)
2022 China ICV Algorithms Challenge Competition (**1st place, 4W RMB**)
2022 Three Good Students Award of UCAS (**top 10%**)
2021 Data Application Innovation and Entrepreneurship Competition (**merit award, 9/453**)
2021 Outstanding Graduate Student Award of Southeast University (**top 3%**)
2020 National College Students Intelligent Vehicle Competition (**national 2nd prize**)
2020 China National Inspiration Scholarship (**top 3.22%**)
2019 RoboCup Robotics World Cup (China Region) (**national 1st prize**)
2019 National College Students Electronic Design Competition (**national 2nd prize**)
2019 The 10th Robot Competition Jiangsu Province (**provincial 1st prize**)
2019 Three Good Students Award of Southeast University (**top 10%**)
2018 The 9th Robot Competition Jiangsu Province (**provincial 1st prize**)
2016 High School Mathematics Olympiad Competition, Anhui Province (**provincial 2nd prize**)

## PROJECTS

### 1. Dense SLAM Research for Underwater Robots Based on Multi-modal Information Fusion

*Jan. 2023 - Present*

- Propose an underwater tightly-coupled hybrid visual inertial dense SLAM framework, named Hybrid-VINS.
- Propose an inertial-acoustic-pressure-structured light underwater state estimation framework.

### 2. Movable Dense Reconstruction and Collision-Free Navigation for Autonomous Underwater Vehicles

*Sep. 2022 - Dec. 2023*

- Propose a structured light-based underwater movable reconstruction framework, named Water-MBSL.
- Design a 3D dense mapping robotic system based on self-designed scanning BSL, named ROV-Scanner.

### 3. Binocular Structured Light 3-D Reconstruction System for Low-Light Underwater Environments

*Sep. 2021 - Jun. 2022*

- Design an underwater binocular structured light scanner by utilizing a galvanometer.
- Propose an binocular refraction measurement model along with a laser-based calibration method.

## ACADEMIC ACTIVITIES

**IEEE Transactions on Intelligent Vehicles** — *Reviewer*
Review one paper related to autonomous driving. July, 2024

**IEEE Sensors** — *Reviewer*
Review two papers related to camera-imu calibration. July, 2023

**2021 40th Chinese Control Conference (CCC)** — *Poster*
Reporting scientific results on underwater speed measurement with peers. June, 2021

## SKILLS

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|---|---|
| **Programming** | C++, C, Python, Matlab, Java |
| **Softwares & Libraries** | ROS, Eigen, Ceres, G2o, Gazebo, Webots |
| **Robotics Hardware** | ARM(STM32), Keil5, Solidworks, Altium Designer |
| **Clipping & Typesetting** | Markdown, Office, LaTeX, Premiere, Origin |
| **Languages** | Chinese (Native), English (CET6 & CET4) |