CURRICULUM VITAE HAI ZHU 2 November 2023

Personal Information

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Date of Birth: 19. Sept.1995, Jiangsu Province, China Ocean College, ZJU
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GS: https://scholar.google.com/citations?user=49dnWPcAAAAJ Zhejiang Province, China

Education

- **Ph.D.** in Marine Technology and Engineering, Zhejiang University, China, 2020-present.
- **Master of Engineering** in Naval Architecture and Ocean Engineering, Zhejiang University, China, 2017-2020.
- **Bachelor of Engineering** in Mechanical Design, manufacturing, and automation, China University of Petroleum, 2013-2017. ||*Exchange student in Mechanical engineering, National Yunlin University of Science and Technology, Taiwan (China), 2015.7-2016.1*||

Research Interests

- **Field Robotics:** Legged robotics, Space robotics, and Soft robotic fish, specializing in artificial muscle, environment perception and navigation planning, novel actuation and system design, soft matter mechanics,and smart material & structures.**!!**
- **Subsea Pipelines**: in-line inspection, external pipeline inspection, pipe-soil interaction.
- **AR/VR/MR:** digital twins, human-AI interaction, consumer electronics.
- **Computer vision:** 3D structured light mapping, image recognition.

Research projects

- *Precision Mapping of Subsea Pipeline Defects Based on Dry Cabin and 3D Structured Light.*
  The Pipe China horizontal Project: No. GWHT20220003812, ¥4,450,000. 02.2022-08.2023
  Student leader, responsible for managing almost all tasks including concept proposal, design, assembly, sea trials, and finance.

- *Drilling Core Sample Pressure Holding Transfer Technology and Device.*
  National Key R&D Program Project: No.2017YFC0307503, ¥3,750,000. 09.2017-05.2021
  Proposed High-fidelity cutting technology, participated in sea trials, and wrote publications.

- *Research on the Effects of Concentration and Temperature on the Rheological Behavior of Kaolin and Bentonite Suspensions.*
  National Youth Science Foundation Project: No.1170020020, ¥246,400. 01.2018-12.2020
  Responsible for rheological experiments, data collection and analysis.

- *Submarine Topography Monitoring Technology for Trial Mining Areas.*
  National Key R&D Program Project: No.2017YFC0307703, ¥2,750,000. 09.2017-09.2020
  Assist in the design of MEMS array placement equipment and functional tests.

- *ROV-Based Underwater Cultural Relics Integrated Detection System.*
  Zhejiang Provincial Cultural Relics Bureau Project: No.2016010,¥500,000. 09.2017-09.2018
  Responsible for using a magnetometer to detect underwater cultural relics.

Scicentific Examination Voyages

- Participated in the secondary repair of the Cezhen subsea pipeline organized by Pipe China, and led the successful acceptance of "*Precision Mapping of Subsea Pipeline Defects Based on Dry Cabin and 3D Structured Light.*" 29. 05.2022-20.06. 2022

- Participated in voyages of the Guangzhou Marine Geological Survey (GMGS) HYDZ2-202101 and HYDZ2-202102, and assisted in the acceptance of "*Drilling Core Sample Pressure Holding Transfer Technology and Device*." 15. 03.2021-07.05. 2021

Scholarships & Awards

- ***The National Scholarship for Doctoral Students of China.*** DEC. 2021
- The second prize in the marine science and technology category of the 9th Zhejiang Provincial Marine Knowledge Innovation Competition. MAY. 2023
- ***Best paper of Journal of Zhejiang University-SCIENCE A.*** JAN. 2023
- First Prize of the 7th "Ocean Tide Cup" at Ocean College, Zhejiang University (First order). DEC. 2022
- The third Prize in the 9th China Graduate Energy Equipment Innovation Design Competition (First order). JUL. 2022
- The Second Prize of the 6th "Ocean Tide Cup" at Ocean College, Zhejiang University (Third order). DEC. 2021
- "Graduate of Merit/Tripe A graduate" of Zhejiang University. 2020-2021
- "Award of Honor for Graduate" of Zhejiang University. 2019,2020,2021
- Zhejiang University Academic Scholarship. Every year 2017-2021
- Outstanding Communist Party Member. JUN. 2023
- Badminton Competition Award (second place) (Captain). 2020 and 2022
- Champion of the Dragon Boat 200m Straight Race. MAY. 2019
- Champion of the Men's Singles Rowing Dynamometer 1000m Race. MAY. 2019
- Third Prize in the 7th Shandong Provincial College Student Mathematics Competition (Non-Mathematics Majors). EDC. 2016
- Second Prize in the 2016 Linear Algebra Competition at China University of Petroleum (East China). EDC. 2016
- Outstanding Student Cadre of the Student Union of the School of Mechanical and Electrical Engineering at China University of Petroleum (East China). SEP. 2015

Publications (💪💪💪Robotics Related)

- **Hai Z.**, Jiawang C., Yuan L., Peng Z., Peiwen L., Xiaoqing P., Haonan L., Kaichuang W., Jin G., Xueyu R., Han G., Zhonghui Z., Yuping F., Zhenjun J., Feng G., Wendi D., Xuehua C., Guoming C., Honghe L., Xu G., Zhaoqiang S., 2023. In-situ Submarine Pipeline Inspection Based on the Structured Light in the Highturbidity Condition. ***[Measurement, Under review]*** 💪💪💪
- **Hai Z**., Jia-wang C., Zi-qiang R., Pei-hao Z., Qiao-ling G., Xiao-ling L., Chun-ying X., Kai H., Peng Z., Feng G., Yu-ping F., 2022b. A new technique for high-fidelity cutting technology for hydrate samples. J. Zhejiang Univ. Sci. A 23, 40–54.
- **Hai Z.**, Jiawang C., Yuan L., Peihao Z., Ziqang R., Xiaoling L., Jing X., Ziang F., 2019. Electronically Controlled Deep Sea Sampling Tube Pressure Maintaining Cutting Device Capable of Long-term Use, in: OCEANS 2019 MTS/IEEE SEATTLE. Presented at the OCEANS 2019 MTS/IEEE SEATTLE, pp. 1–4.
- **Hai Z.**, Jiawang C., Yuan L., Peihao Z., Huangchao Z., Ziqang ren, 2018. A high pressure holding and cutting device for sampling tube of natural gas hydrate, in: OCEANS 2018 MTS/IEEE Charleston. Presented at the OCEANS 2018 MTS/IEEE Charleston, pp. 1–4.
- **Hai Z.**, Jia Wang C., Xue Yu R., Jin G., Hao Nan L., Peng Z., Tao L., 2022a. Application of Electromagnetic Emission Technology in In-Situ Subsea Dynamic Penetration Test, in: The proceedings of the 16th Annual Conference of China Electrotechnical Society, Lecture Notes in Electrical Engineering. Springer Nature, Singapore, pp. 628–635. 💪💪💪
- Yuan L., **Hai Z**., Wei W., Jiawang C., Nhan P.-T., Dingyi P., 2019. Rheological behavior for laponite and bentonite suspensions in shear flow. AIP Advances 9, 125233.
- Yuan L., Wei W., **Hai Z.**, Jiawang C., Nhan P.-T., Dingyi P., 2020. Size effect of the parallel-plate geometry on the rheological behavior of bentonite suspensions. Journal of Rheology 64, 111–117.
- Yuan L., Yue H., **Hai Z**., Haocai H., Ying C., 2021. Simulation study on the hydrodynamic resistance and stability of a disk-shaped autonomous underwater helicopter. Ocean Engineering 219, 108385. 💪💪💪

- Ziqiang R., Feng Z., **Hai Z.**, Peihao Z., Jiawang C., Peng Z., Lieyu T., Chunhu L., Xiaochao Z., 2021. Analysis and Research on Mobile Drilling Rig for Deep Seabed Shallow Strata. Marine Technology Society Journal 55, 81–93. 💪💪💪
- Peng Z., Xiaoqing P., **Hai Z.**, Xueyu R., Peiweng L., Kaichuang W., Haonan L., Zhonghui Z., Jiawang C., Jun L., Xuehua C., Guomin C., Xu G., 2023. Research on 3-D Precise Mapping System for Deformation Defects of Submarine Pipeline. Marine Technology Society Journal 57, 35–43. 💪💪💪
- Qiaoling G., Peihao Z., **Hai Z.**, Ziqiang R., Xiaoling L., Jiawang C., 2019. Development of Analysis and Transfer System of Seafloor Natural Gas Hydrate Pressure Core. Presented at the 29th International Ocean and Polar Engineering Conference, OnePetro.
- Yuan L., Jin G., Haonan L., **Hai Z.**, Haocai H., Ying C., 2022. Study on the Motion Stability of the Autonomous Underwater Helicopter. Journal of Marine Science and Engineering 10, 60. 💪💪💪
- Peihao Z., Jiawang C., Zhenwei T., **Hai Z.**, Ziqiang R., 2022. A Review of Stratum-Drilling Robots: Developing for Seabed Exploration. Marine Technology Society Journal 56, 98–117. 💪💪💪
- Z. T., J. C., P. Z., **H. Z.**, D. R., Y. G., 2021. Design of a drilling unit for deep-sea stratum drilling robot. IOP Conf. Ser.: Earth Environ. Sci. 861, 072031. 💪💪💪
- Wei W., Jiawang C., Yuan L., **Hai Z.**, Yue H., Weitao H., Hao W., Jin X., 2019. A Submarine Seep Bubble Collecting Device, in: OCEANS 2019 - Marseille. Presented at the OCEANS 2019 - Marseille, pp. 1–4.
- Huangchao Z., Chunying X., Houhong L., **Hai Z.**, Ziqiang R., Peihao Z., Xiaoling L., 2018. Research on Distributed Synchronous Acquisition System for Seabed Terrain Deformation Monitoring, in: OCEANS 2018 MTS/IEEE Charleston. Presented at the OCEANS 2018 MTS/IEEE Charleston, pp. 1–4.
- Yongqiang G., Jiawang C., Chen C., Peng Z., Chunying X., **Hai Z.**, Qixiao Z., 2022. MEMS Sensor Network for Submarine Terrain and Strata Deformation Monitoring: Design and Field Experiment. IEEE Transactions on Instrumentation and Measurement 71, 1–17.
- Chunying X., Jiawang C., Yongqiang G., Ziqiang R., Chen C., **Hai Z.**, Yue H., Hao W., Wei W., 2020. Monitoring the vertical changes of a tidal flat using a MEMS accelerometer array. Applied Ocean Research 101, 102186.
- Chunying X., Jiawang C., Huangchao Z., Peihao Z., Ziqiang R., **Hai Z.**, Yuan L., 2018. Design and laboratory testing of a MEMS accelerometer array for subsidence monitoring. Review of Scientific Instruments 89, 085103.
- Peiwen L., Xingshuang L., Qixiao Z., Yuan L., Jiawang C., Han G., **Hai Z.**, Xueyu R., Xiaoqing P., Kaichuang W., 2023. Air Habitat for Detection and Repair of Submarine Oil Pipelines in Complex Sea Conditions, in: OCEANS 2023 - Limerick. Presented at the OCEANS 2023 - Limerick, pp. 1–5. 💪💪💪

Patents

- Jiawang C., **Hai Z.**, Peihao Z., et al., 2022. A Cutting Tool for Pressure-maintaining Cutting Device of Sampling Pipe. Chinese Patent. No. ZL 2021 1 0299259.0. ***Authorized***

- Jiawang C., **Hai Z.**, Yongqiang G., et al., 2022. A Mechanical Swing Type Polar Sub-ice Moving Ice Core Sampler. Chinese Patent. No. ZL 2021 1 0390439.X. ***Authorized***

- Jiawang C., **Hai Z.**, Dongrui R., et al., 2022. A New Hot Melt Sampler for the Lower Layer of Polar Floating Ice. Chinese Patent. No. ZL 2021 1 0388856.0. ***Authorized***

- Jiawang C., **Hai Z.**, Dongrui R., et al., 2021. A shallow sea heave static cone penetration test equipment. Chinese Patent. No. CN113216127A. ***Open***

- Jiawang C., **Hai Z.**, Peiwen L., et al., 2022. An electromagnetic hammer head for seabed in-situ dynamic penetration test. No. CN114232584A ***Open***

- Jiawang C., **Hai Z.**, Xiaoqing P., et al., 2022. A retrievable continuous hammering device based on electromagnetic coil gun. Chinese Patent. No. CN114483022A ***Open***

■ Jiawang C., **Hai Z.**, Kaichuang W., et al., 2022. A precise mapping tool and method for deformation defects of submarine pipeline. Chinese Patent. No.CN115468123A. ***Open***

■ Jiawang C., **Hai Z.**, Qixiao Z., et al., 2023. Integrated manned mapping equipment and method for subsea pipelines. Chinese Patent.No.CN116118982A. ***Open***

■ Jiawang C., Peihao Z., Xingshuang L., **Hai Z.**, et al., 2022. SUBMARINE STRATUM SPACE CABLE LAYING ROBOT. US Patent. No. US 2023/0135602 A1 ***Open***

Memberships & Journal Reviewer

- Membership of THE ROYAL INSTITUTION OF NAVAL ARCHITECTS 2023
- Journal Reviewer: Measurement 2022
- Membership of China Electrotechnical Society 2021

Service

Conference Volunteer

- The OceanTech Program (OT2021) 2021
- The 4th Seafloor Observation Symposium 2018

Student Club

- Secretary of the Graduate Party Branch of the Institute of Ocean Engineering and Technology, ZJU 2021-2022
- Leader of the Organization Department of the Student Union of the College of Mechanical and Electrical Engineering, UPC. 2014-2015

Internships

■ Shengli Oilfield Shengli Chemical Co., Ltd.—— 2015/08-2015/09

■ Weichai Holding Group Co., Ltd.（ Fortune 500）——2016/07-2016/09

Skills

Name	Types	Proficiency level
Swift/Java/Python	Programming Languages	Basic
C++/Markdown/Latex	Programming Languages	Intermediate
Xcode/ Vscode/Matlab	IDE	Intermediate
Origin/ Xmind/Zotero	Research assistance software	Advanced
ABAQUS/ ANSYS	Simulation	Advanced
Office/Visio	Basic office software	Advanced
Physics/ Mathematics	Subject	Advanced
Solidworks/ AutoCAD	Design	Expert
3D Point Cloud	Computer vision	Advanced
Badminton/Table tennies	Sports	Advanced

Languages

■ Mother Tongue: Mandarin Chinese.

■ IELTS:6.0