CURRICULUM VITAE

HAI ZHU

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EDUCATION

- **Ph.D. in** Ocean 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 and manufacturing and automation**, China University of Petroleum, China, 2013-2017**. ||*Exchange student in Mechanical engineering, National Yunlin University of Science and Technology, Taiwan (China), 2015.7-2016.1*||

RESEARCH PROJECTS

- 2017.9-2021.5, National Key R&D Program Project: No.2017YFC0307503, Drilling Core Sample Pressure Holding Transfer Technology and Device, Scientific Research Backbone.
- 2017.9-2020.9, National Key R&D Program Project: No.2017YFC0307703, Topographic and Stratigraphic Deformation Monitoring Technology and Equipment for Trial Mining Areas, Scientific Research Backbone.
- 2017.9-2018.9, Zhejiang Provincial Cultural Relics Bureau Project: No.2016010, ROV Based Underwater Cultural Relics Integrated Detection System, Scientific Research Backbone
- 2018.01-2020.12, National Youth Science Foundation Project: No.1170020020, Research on the Effects of Concentration and Temperature on the Rheological Behavior of Kaolin and Bentonite Suspensions, Student Leader.
- 2022.2-2023.8, The Pipe China Eastern Crude Oil Storage and Transportation Co., Ltd. horizontal Project: No. GWHT20220003812, 3D Laser Precision Surveying of Submarine Pipeline Defects Based on Dry Cabins, Student Leader.

SCIENTIFIC EXAMINATION EXPERIENCE

- On March 15, 2021, to May 7, 2021, participated in the acceptance voyages of the Guangzhou Marine Geological Survey (GMGS) "HAIYANGDIZHI2HAO" scientific research vessels HYDZ2-202101 and HYDZ2-202102, and participated in “the research and application of natural gas hydrate seabed drilling and onboard detection technology.”
- On May 29, 2022, to June 20, participated in the sea trial of the secondary repair of the Cezhen subsea pipeline organized by the Pipe China Eastern Crude Oil Storage and Transportation Co., Ltd., and led the successful acceptance of “the 3D laser precise mapping project for subsea pipeline defects based on dry cabin”.

SCHOLARSHIPS & AWARD

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

CURRENT PUBLICATIONS

⌈ *Subsea pipeline engineering* ⌋

- 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. https://doi.org/10.4031/MTSJ.57.1.6 *External pipeline inspection(EPI)*
- 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. https://doi.org/10.1109/OCEANSLimerick52467.2023.10244319 *Underwater habitat*
- **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. *EPI*

⌈ *Natural gas hydrates* ⌋

- **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. https://doi.org/10.1631/jzus.A2100188 *High-fidelity cutting*
- **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. https://doi.org/10.1109/OCEANS.2018.8604734 *High-fidelity cutting*
- **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. https://doi.org/10.23919/OCEANS40490.2019.8962564 *High-fidelity cutting*

- 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. *Pressure-maintain and transfer of hydrate samples*

⌈ *Rheology* ⌋

- 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. https://doi.org/10.1063/1.5129211 *Clay rheology*
- 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. https://doi.org/10.1122/1.5116118 *Clay rheology*

⌈ *Computational fluid dynamics（CFD）* ⌋

- 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. https://doi.org/10.3390/jmse10010060 *AUV(Autonomous Underwater Vehicle)*
- 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. https://doi.org/10.1016/j.oceaneng.2020.108385 *AUV*

⌈ *Offshore geotechnical engineering* ⌋

- **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. https://doi.org/10.1007/978-981-19-1870-4_67 *DPT(dynamic penetration test)*
- 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. https://doi.org/10.4031/MTSJ.55.2.7 *CPT(cone penetration test)*
- 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. https://doi.org/10.1109/TIM.2022.3218336 *Submarine topography monitoring (based MEMS)*
- 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. https://doi.org/10.1016/j.apor.2020.102186 *MEMS*
- 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. https://doi.org/10.1063/1.5036666 *MEMS*
- 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. https://doi.org/10.1109/OCEANS.2018.8604880 *MEMS*
- 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. https://doi.org/10.4031/MTSJ.56.1.6 *Stratum-drilling robots*
- 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. https://doi.org/10.1088/1755-1315/861/7/072031 *Stratum-drilling robots*
- 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. https://doi.org/10.1109/OCEANSE.2019.8867533 *Subsea sampling*

OTHER RESEARCH INTEREST

- **Soft robotic fish**: soft matter mechanics, smart material & structures, underwater equipment, artificial muscle.
- **Healthcare devices**: wearable devices, medical equipment, brain-computer interface.
- **AR/VR/MR**
- **3D structured light mapping**
- **Pipe-soil interaction**
- **Other related research field**

PATENTS

Name	Country	Inventors sorting (excluding tutors)	Status	Year
A Cutting Tool for Pressure-maintaining Cutting Device of Sampling Pipe	Chinese	First order	Authorized	2022
A Mechanical Swing Type Polar Sub-ice Moving Ice Core Sampler	Chinese	First order	Authorized	2022
A New Hot Melt Sampler for the Lower Layer of Polar Floating Ice	Chinese	First order	Authorized	2022
A shallow sea heave static cone penetration test equipment	Chinese	First order	Open	2021
An electromagnetic hammer head for seabed in-situ dynamic sounding equipment	Chinese	First order	Open	2022
A retrievable continuous hammering device based on electromagnetic coil gun	Chinese	First order	Open	2022
A precise mapping tool and method for deformation defects of submarine pipeline	Chinese	First order	Open	2022
Integrated surveying and mapping equipment for manned submarine pipeline and surveying and mapping method for submarine pipeline	Chinese	First order	Open	2023

SKILLS

Name	Types	Proficiency level
Swift/Java/Python	Programming Languages	Novice (limited experience)
C++/Markdown/Latex	Programming Languages	Intermediate (practical application)
Xcode/ Vscode/Matlab	IDE	Intermediate (practical application)
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
Badminton/Table tennies	Sports	Advanced

PRACTICE & INTERNSHIP

- Shengli Oilfield Shengli Chemical Co., Ltd.—— 2015/08-2015/09
- Weichai Holding Group Co., Ltd. （ Fortune 500）——2016/07-2016/09

LANGUAGES

- Mother Tongue: Mandarin Chinese.
- IELTS:6.0, better at writing than speaking.