Baiheng Wu

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Education 💼

Norwegian University of Science and Technology (NTNU)   **Jul. 2019 – Jun. 2022 (expected)**

Ph.D. in Ocean Operations and Civil Enigneering   *Ålesund, Norway*

- Ph.D. project title: Synthesis of Human-in-the-loop Control and Learning System for Autonomous Maneuvering.
- Supervisors: Guoyuan Li, Houxiang Zhang, Hans Petter Hildre.

Norwegian University of Science and Technology (NTNU)   **Aug. 2016 – Mar. 2019**

M.Sc. in Marine Technology - Marine Cybernetics   *Trondheim, Norway*

- GPA: B; Thesis title: Image Processing and Target Tracking Technology in the Sea Cucumber Fishing Application.
- Exchange student at Universidad Politécnica de Madrid, Madrid, Spain and Mines ParisTech, Paris, France.

Tianjin University   **Sep. 2012 – Jul. 2016**

B.Eng. in Ocean Engineering   *Tianjin, P.R.China*

- GPA: 3.68/4.0.
- Exchange research assistant with Michael Triantafyllou and Dixia Fan at the Towing Tank Laboratory at Massachusetts Institute of Technology (MIT), Cambridge, USA.

Publication 🎓   R⁶

Publication relevant with Ph.D. project

Journal

[1] **Baiheng Wu**, Guoyuan Li, Luman Zhao, Hans-Ingar Johansen Aandahl, Hans Petter Hildre and Houxiang Zhang: Navigating patterns analysis for on-board guidance support in crossing collision avoidance operations, IEEE Intelligent Transportation Systems Magazine, accepted, 2021.

[2] **Wu, B.**, Li, G., Wang, T., Hildre, H. P., & Zhang, H. (2021). Sailing status recognition to enhance safety awareness and path routing for a commuter ferry. Ships and Offshore Structures, 1-12.

[3] Wang, T., Li, G., **Wu, B.**, Æsøy, V., & Zhang, H. (2021). Parameter identification of ship manoeuvring model under disturbance using support vector machine method. Ships and Offshore Structures, 1-9.

Conference

[1] Peihua Han, Guoyuan Li, Stian Skjong, **Baiheng Wu** and Houxiang Zhang: Data-driven sea state estimation for vessels using multi-domain features from motion responses, IEEE International Conference on Robotics and Automation (ICRA), Xi'an, China, Proceedings in progress.

[2] **Wu, B.**, Li, G., Zhao, L., Hildre, H. P., & Zhang, H. (2020, November). A human-expertise based statistical method for analysis of log data from a commuter ferry. In 2020 15th IEEE Conference on Industrial Electronics and Applications (ICIEA) (pp. 1471-1477). IEEE.

[3] Zhao, L., Li, G., Remøy, K., **Wu, B.**, & Zhang, H. (2020, November). Development of Onboard Decision Supporting System for Ship Docking Operations. In 2020 15th IEEE Conference on Industrial Electronics and Applications (ICIEA) (pp. 1456-1462). IEEE.

Other publication

Journal

[1] Li, A., **Wu, B.**, & Fan, D. Vortex-induced Vibration of Risers with Staggered Buoyancy Modules of Small Aspect Ratio. Applied Ocean Research. Under review.

[2] Fan, D., **Wu, B.**, Bachina, D., & Triantafyllou, M. S. (2019). Vortex-induced vibration of a piggyback pipeline half buried in the seabed. Journal of Sound and Vibration, 449, 182-195.

[3] JI Chun-Ning, TAN Pei-Sen, **WU Bai-Heng**. Hydrodynamics Research of Dual Oscillating Cylinders System of Side-By-Side Pattern in Still Water[J]. Periodical of Ocean University of China, 2019, 49(6): 104-112.

Conference

[1] **Wu, B.**, Le Garrec, J., Fan, D., & Triantafyllou, M. S. (2017, June). Kill Line Model Cross Flow Inline Coupled Vortex-Induced Vibration. In International Conference on Offshore Mechanics and Arctic Engineering (Vol. 57649, p. V002T08A010). American Society of Mechanical Engineers.

[2] Le Garrec, J., Fan, D., **Wu, B.**, & Triantafyllou, M. S. (2016, September). Experimental investigation of cross flow-inline coupled vortex-induced vibration on riser with finite length buoyancy module. In OCEANS 2016 MTS/IEEE Monterey (pp. 1-7). IEEE.

Project

Startplugg: Intelligent Ship Bridge System for Learning Navigators' Operational Behaviors | *Leader*

Jul. 2021 - Jun. 2022

- Funded by NTNU with an amount up to 50 000 NOK. As a supplementary fund to the Ph.D. research.
- Recording human navigators' physiological signals extensively, utilizing (and not limited to) electroencephalogram (EEG), eye tracker, gesture recognition, and body motion tracker; Synchronizing and interpreting recorded chronological data from multiple sensors; Modeling and summarizing operational behaviors based on synchronized and interpreted data; Establishing intelligent bridge surveillance and providing decision support to navigators in terms of behavioral models.

KPN: Digital Twins for Vessel Life Cycle Service (TwinShip) | *Participant*   **Jul. 2019 - Dec. 2021**

- Funded by Norges forskningsråd (the Research Council of Norway). Main funding source for the Ph.D. fellowship.
- Focusing on the synthesis research on the human-in-the-loop control and learning system for autonomous maneuvering, by means of analyzing data collected from real ships and ship-bridge simulators, establishing risk models (navigating patterns) in different maneuvering scenes, and applying control schemes to promote the performance of human navigators.

Academic Associate & Outreach

IEEE | *Student Member*   **Feb. 2020 - Present**

Institute of Human Factors and Ergonomics, Shenzhen Univ., P.R.C. | *Research Advisor*   **Jul. 2019 - Present**

ePropulsion Group, Donguan, P.R.C. | *R & D Advisor on underwater drones*   **Apr. 2019 - Present**

Research Interest

- Human factors & Ergonomics
- Control theory & application
- Watercraft autonomy
- Risk analysis & management
- Fluid-structure interaction
- Physical-model based experiment

Technical Skills

Programming: Python, .m (MATLAB), C++, html
Technologies/Frameworks: Windows/macOS/Linux, LaTeX, Adobe suite
Languages: English (fluent), Chinese (native), Norwegian/French/Japanese (basic)