

Zhen Yang

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EDUCATION

- 09/2020- **Beihang University (BUAA), Beijing, China**
- 01/2023 Master's Degree in Mechanics, School of Mechanical Engineering and Automation, GPA: 3.73/4.0.
Academic focus/background: Bionic robotics, Embedded development, Multi-modal sensing, Machine learning
- 09/2016- **China Agricultural University (CAU), Beijing, China**
- 06/2020 Bachelor's Degree in Automation of Honors Program (two years in computer science, two years in automation), College of Information and Electrical Engineering, GPA: 3.55/4.0, postgraduate recommendation

RESEARCH ACHIEVEMENTS

JOURNAL ARTICLES

Published:

- **Yang, Z.**, Gong, Z., Jiang, Y.*, Cai, Y., Ma, Z., Na, X., Dong, Z. and Zhang, D., 2022. Maximized Hydrodynamic Stimulation Strategy for Placement of Differential Pressure and Velocity Sensors in Artificial Lateral Line Systems. *IEEE Robotics and Automation Letters*, 7(2), pp.2170-2177.
Presented at *International Conference on Robotics and Automation (ICRA)* 2022.
Paper link: <https://ieeexplore.ieee.org/abstract/document/9682540>
- Jiang, Y.*, Gong, Z., **Yang, Z.**, Ma, Z., Wang, C., Wang, Y. and Zhang, D., 2021. Underwater source localization using an artificial lateral line system with pressure and flow velocity sensor fusion. *IEEE/ASME Transactions on Mechatronics*, 27(1), pp.245-255.
Paper link: <https://ieeexplore.ieee.org/document/9367000>
- Gong, Z., Cao Y., Cao H., Wan B., **Yang, Z.**, Ke, X., Zhang, D., Chen, H., Wang, K., and Jiang, Y.*, 2023, Morphological intelligence mechanisms in biological and biomimetic flow sensing, *Advanced Intelligent Systems*, p.2300154.

COMPUTER SOFTWARE COPYRIGHT

- ESP-12f based greenhouse environmental control system. China Computer Software Copyright, announcement January 25, 2019

PATENT

- A kind of electronic terminal. China Utility Model Patent CN207265242, filed May 3, 2017, and authorization announcement April 20, 2018.

SKILLS

- Programming: Python, C++, Matlab, QT, Pytorch, Paddlepaddle.
- Modeling and rendering software: SolidWorks, 3ds Max, V-ray, Unreal Engine 4.
- Simulation software: Ansys fluent, Simulink/Simscape, Abaqus, Adams.
- Prototyping: schematic circuit design, PCB design, circuit debugging.
- Related courses:
 - Robotics, soft robotics, machine learning, intelligent optimization computing, finite element analysis, principle of automatic control, modern control theory, computer control system, et al.
 - Embedded Linux, single-chip system, data structure & algorithm, computer organization & architecture, database principle, digital/analog electronic technology, et al.

RESEARCH EXPERIENCE

BIONIC SENSING LAB, INSTITUTE OF BIONIC AND MICRO-NANO SYSTEMS, BEIHANG UNIVERSITY

Supervisor: Prof. Yonggang Jiang (Excellent youth fund of National Natural Science Foundation)

09/2021-12/2022 **Artificial lateral line fusion sensing technology for robotic blind fish** (National Natural Science Foundation of China Project) – Project leader

- Proposed a maximized hydrodynamic stimulation strategy for multi-modal sensor array placement optimization.
- Designed and fabricated the first bionic robotic blind fish with an artificial lateral line system integrating pressure and flow velocity sensors. Independently completed all the work of model structure design (Solidworks), hydrodynamic simulation (Ansys Fluent), ESP32/ADC/sensor circuit design (JLC EDA), embedded software development (C++) and motion control (Matlab/multibody), et al.
- **First author** of the paper *Maximized Hydrodynamic Stimulation Strategy for Placement of Differential Pressure and Velocity Sensors in Artificial Lateral Line Systems*, published at **RA-L/ICRA 2022**.

11/2019-04/2021 **Targeting of underwater vibration sources** (National Natural Science Foundation of China Project) – Deputy project leader

- Coded neural network program by Keras and C++ on embedded devices for predicting the 3D coordinates of vibration source.
- Developed data acquisition and processing programs for pressure and flow velocity sensor array.
- **Second student author** of the paper *Underwater Source Localization Using an Artificial Lateral Line System with Pressure and Flow Velocity Sensor Fusion*, published at **TMECH**.

FLUID INFORMATION AND INTELLIGENCE LAB (I⁴-FSI LAB), WESTLAKE UNIVERSITY

Supervisors: Prof. Dixia Fan and Prof. Weicheng Cui

06/2022- **Bionic multi-joint rigid-flexible coupling robotic fish** – Project member, visiting student

- 09/2022
- Use magnets and multi-link mechanisms to mimic the muscles and bones of fish to improve robot fish movement.
 - Completed the dynamic modeling and simulation of the magnetic joints at the tail of the robotic fish using Simulink/multibody.

CHINA AGRICULTURAL UNIVERSITY

Supervisor: Prof. Fanjia Meng

06/2017- **Agricultural Harvesting AGV Platform** (National College Student Innovation Program) – Team leader

- 06/2018
- Development of the upper computer program for the robotic arm and the development of the magnetic navigation program.

WORKING EXPERIENCE

01/2023-now **Zhiyuan Research Institute (State Key Laboratory), Hangzhou, China** – Embedded Software Engineer

- Embedded software development for body area network devices based on OpenWrt.
- Construction and management of the Motion Capture and Localization Laboratory.
- Assist in writing proposals and applying for projects.

06/2022- **Westlake University, Hangzhou, China** – Visiting Student

- 09/2022
- Robot dynamics and kinematic modeling.

AWARDS

2020-2022 Second-Class Academic Scholarship × 3, BUAA

2019 First-Class Academic Scholarship (Top 5%), CAU
Mathematical Contest in Modeling, Honorable Mention

2018 Second-Class Academic Scholarship, CAU

2017 Third-Class Academic Scholarship, CAU