

Jinhong Wu — Curriculum Vitae

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SUMMARY

Research Interests: My research primarily lies in **deep learning** and **AI for Science** (e.g., intelligent fluid dynamics), Additionally, I am interested in the **perception and locomotion of robotics**. My ultimate objective is to integrate deep learning algorithms with traditional scientific methodologies.

Highlight: 5 years of programming experience; 4 years of research experience with solid mathematical and theoretical background; attended the Oriel College Summer School at the University of Oxford (2019).

Relevant Courses: Matrix Theory (96), Mathematical Statistics (93), Introduction to Robotics (93), Academic norm and writing (81), Linear Algebra (95), System Dynamic & control (99), Calculus (99), Complex function and Integral Transform (93), Dynamics and Bifurcations (99), Engineering Graphics (96), Dynamics (94), Mission Planning for Unmanned Aerial (92).

EDUCATION

Huazhong University of Science and Technology (HUST)

M.E. in Mechanical Engineering

Wuhan, CHN

September 2021 - June 2024 (expected)

- GPA: 3.87/4.0
- Rank: 5/51
- Centesimal grade average: 89.09

Huazhong University of Science and Technology (HUST)

B.E. in Aircraft Design and Engineering

Wuhan, CHN

September 2017 - June 2021

- GPA: 3.97/4.0
- Rank: 3/42
- Centesimal grade average: 92.50

AWARDS & HONORS

- **Merit Postgraduate**, Huazhong University of Science and Technology, 2022
- **First-class Scholarship for Postgraduates**, HUST, 2021, 2022, top 1% students in HUST
- **Third Prize of Zhixing Scholarship**, Huazhong University of Science and Technology, 2022
- **Graduate Freshman Scholarship**, HUST, 2021, top 10% students (Recommended exemption Graduate)
- **Outstanding Graduates**, Huazhong University of Science and Technology, 2021
- **Excellent Graduation Thesis**, HUST, 2021, top 5% students in HUST
- **Outstanding Undergraduate Students**, HUST, 2018, top 1% students in HUST
- **National Encouragement Fellowship**, HUST, 2018, 2019, 2020, top 5% students in HUST
- **Merit Student**, Huazhong University of Science and Technology, 2019
- **Model Student of Academic Records**, Huazhong University of Science and Technology, 2017

RESEARCH EXPERIENCE

Machine Learning-Based Manipulation Technique for Low-Frequency Acoustic Field 2021 - 2022

- **Introduction:** Conventional optimization methods for acoustic metasurfaces typically rely on high-performance numerical simulation models, which can lead to significant computational costs and time-consuming simulations.
- Proposed a deep learning-based optimization framework for achieving acoustic uniformity, which consists of three key components: Data Preparation, Multi-Fidelity Neural Network, and Physical Parameters Optimization.
- Multi-Fidelity Neural Network reaches the highest accuracy and the mean absolute error is improved by at least 20% compared to the comparative models. The variance of the obtained scattered acoustic field after

optimization is reduced by 3.62%, and the time cost is only 8% of the genetic algorithm.

Physics-informed Physics Field Prediction

2022 – 2023

- **Introduction:** Data-driven models typically require a large amount of data, which can be difficult to obtain in engineering applications. Moreover, the extrapolation performance of these models is often poor, and the predicted results may not be consistent with physical laws.
- Proposed a physics-informed neural network that incorporates the heat transfer equation and boundary conditions into the loss function to predict the temperature field of a fuel tank.
- Compared to unconstrained models, the MAE of the predicted temperature field was reduced from 1.1 to 0.69.

SKILLS

Programming	Matlab, Python, C++
Frameworks	Linux, PyTorch, Tensorflow, Numpy, JAX, OpenCV
Languages	English (IELTS: 6.5)

PUBLICATIONS

- **A deep learning-based multi-fidelity optimization method for the design of acoustic metasurface**
Jinhong Wu, Xingxing Feng, Xuan Cai, Xufeng Huang, Qi Zhou*
Engineering with Computers, 2022. IF: 8.083, Rank: Q1. DOI: [10.1007/s00366-022-01765-9](https://doi.org/10.1007/s00366-022-01765-9)
- **A two-stage adaptive multi-fidelity surrogate model-assisted multi-objective genetic algorithm for computationally expensive problems**
Qi Zhou (supervisor), Jinhong Wu, Tao Xue, Peng Jin*
Engineering with Computers, 2021. IF: 8.083, Rank: Q1. DOI: [10.1007/s00366-019-00844-8](https://doi.org/10.1007/s00366-019-00844-8)
- **Study on productivity and aerosol emissions of magnetic field-assisted EDM process of SiCp/Al composite with high volume fractions**
Zhen Zhang, Yi Zhang, Liquan Lin, Jinhong Wu, Haishen Yu, Xin Pan, Guangliang Li, Jie Wu, Tao Xue*
Journal of Cleaner Production, 2021. IF: 11.072, Rank: Q1. DOI: [10.1016/j.jclepro.2021.126018](https://doi.org/10.1016/j.jclepro.2021.126018)

OTHER PUBLICATIONS (Under Review)

- **Three-Dimensional Hybrid Fusion Networks for Current-based Fault Diagnosis**
Xufeng Huang, Tingli Xie, Jinhong Wu, Qi Zhou, Jiexiang Hu*
submitted to *IEEE TIM* (under review), 2023. IF: 5.332, Rank: Q1.
- **Unsteady Temperature Field Prediction for Aircraft Fuel Tank using External Attention-Guided Point Neural Network**
Xufeng Huang, Tingli Xie, Jinhong Wu, Anfu Zhang, Qi Zhou*
submitted to *EAAI* (under review), 2022. IF: 7.802, Rank: Q1.
- **A signal transformation-based semi-supervised fault diagnosis method**
Shuyang Luo, Dong Zhang, Jinhong Wu, Yanzhi Wang, Qi Zhou, Jiexiang Hu*
submitted to *Knowledge-Based Systems* (under review), 2023. IF: 8.139, Rank: Q1.

COMPETITIONS (selected)

- **The 19th China Postgraduate Mathematical Contest in Modeling (CPMCM) - Huawei Cup**, National Second Prize, 2022
- **Huawei Software Elite Challenge (Wuhan-Changsha Division)**, Second Prize, 2022
- **Mechanical Engineering Innovation and Creativity Competition (Fault diagnosis of motor current signals)**, National Second Prize, 2022
- **Alibaba Cloud Tianchi AAI 2022 Security AI Challenger Program Phase 8**, Top 1% (30/3169), 2021
- **Jiangsu Big Data Development and Application Competition (Cancer image segmentation)**, Top 2% (13/653), 2020