Zhenling Mo, Ph.D.

Email: zhenling.mo@my.cityu.edu.hk
Phone: (+86) 132 0817 4878
Google scholar: 640+ citations
Papers (first/corresponding): 10 published, 5 under review
Personal webpage: https://mozhenling.github.io/
Research interests: causal machine learning, intelligent model generalization, mechanical signal processing, fault diagnosis and prognosis

Employment (Full-time)

09. 2024 – Present — **Postdoctoral Fellow, Department of Data Science, College of Computing, City University of Hong Kong, Hong Kong**
(School of Data Science was changed to Department of Data Science, College of Computing on 01.09.2024)

03. 2024 – 09. 2024 — **Postdoctoral Fellow, School of Data Science, City University of Hong Kong, Hong Kong**

12. 2023 – 03. 2024 — **Research Associate, City University of Hong Kong Shenzhen Research Institute, Mainland China**
(Ph.D. thesis defense on 11.10.2023, Ph.D. degree approved by the Senate on 30.10.2023, Full-time job is allowed after the Senate's approval, Official graduation on 01.02.2024)

Education

09. 2020 – 02. 2024 — **Ph.D., School of Data Science, City University of Hong Kong, Hong Kong**
Major: *Data Science*
Grade Point Average: *3.83/4.3*
Thesis title: *Machine Fault Diagnosis Based on Causality Inspired Learning*
Supervisors: *Prof. Zijun Zhang, and Prof. Kwok-Leung Tsui*

09. 2017 – 06. 2020 — **M.Eng., School of Aeronautics & Astronautics, Sichuan University, Mainland China**
Major: *Aeronautical and Astronautical Science and Technology*
Grade Average: *91.4/100, top 1*
Thesis title: *Rotating Machinery Fault Diagnosis Based on the Generalized Spectral Kurtosis.*
Supervisors: *Prof. Qiang Miao*

09. 2013 – 06. 2017 — **B.Eng., School of Mechanical Science & Engineering, Huazhong University of Science & Technology, Mainland China**
Major: *Measurement and Control Technology and Instrument*
Grade Average: *84.3/100, top 30%*
Thesis title: *Design of Data Acquisition System for Magnetic Flux Leakage Detection of Steel Wire Rope*
Thesis Supervisors: *Prof. Yanhua Sun*

Teaching

2022/23 Semester B — **Teaching Assistant, SDSC4066 Professional Engineering Practice**
Lectures on Data Science Ethics; Student Presentation Evaluation Class.

2021/22 Semester B — **Teaching Assistant, SDSC8015 Machine Learning & Control Theory**
Lectures on Function Approximation& TensorFlow; Assignments and Exams.

2021/22 Semester A — **Teaching Assistant, SDSC2001 Python for Data Science**
Lectures on Python Preliminaries & Pandas; Assignments and Exams.

Publication

Zhenling Mo is in **Boldface**
∗ indicates corresponding author(s)
Red&*Tilt* indicates Clarivate JCR's JIF ranking Q1, or Top
Blue&Upright indicates other JCR rankings, or others

Journal Papers (Peer Reviewed, SCI/SCIE)

[1] T. Hu, **Z. Mo**∗, and Z. Zhang∗, "A life-stage domain aware network for bearing health prognosis under unseen temporal distribution shift," *IEEE Transactions on Instrumentation and Measurement*, vol. 73, pp. 1–12, 2024.

[2] **Z. Mo**, Z. Zhang∗, Q. Miao, and K.-L. Tsui, "Sparsity-constrained invariant risk minimization for domain generalization with application to machinery fault diagnosis modeling," *IEEE Transactions on Cybernetics*, vol. 54, no. 3, pp. 1547–1559, 2024.

[3] **Z. Mo**∗, Z. Zhang∗, and K.-L. Tsui, "Distance aware risk minimization for domain generalization in machine fault diagnosis," *IEEE Internet of Things Journal*, pp. 1–1, 2024. DOI: 10.1109/JIOT.2024.3441253.

[4] **Z. Mo**, H. Zhang, Y. Shen, J. Wang, H. Fu, and Q. Miao∗, "Conditional empirical wavelet transform with modified ratio of cyclic content for bearing fault diagnosis," *ISA transactions*, vol. 133, pp. 597–611, 2023.

[5] **Z. Mo**, Z. Zhang∗, Q. Miao, and K.-L. Tsui, "Intelligent informative frequency band searching assisted by a dynamic bandit tree method for machine fault diagnosis," *IEEE/ASME Transactions on Mechatronics*, vol. 28, no. 2, pp. 770–780, 2023.

[6] **Z. Mo**, H. Zhang, J. Wang, J. Wang, H. Fu, and Q. Miao∗, "Adaptive meyer wavelet filters for machinery fault diagnosis based on harmonic infinite-taxicab norm and grasshopper optimization algorithm," Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, vol. 235, no. 19, pp. 4458–4474, 2021.

[7] **Z. Mo**, Z. Zhang∗, and K.-L. Tsui, "The variational kernel-based 1-d convolutional neural network for machinery fault diagnosis," *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1–10, 2021. DOI: 10.1109/TIM.2021.3105252.

[8] **Z. Mo**, J. Wang, H. Zhang, and Q. Miao∗, "Weighted cyclic harmonic-to-noise ratio for rolling element bearing fault diagnosis," *IEEE Transactions on Instrumentation and Measurement*, vol. 69, no. 2, pp. 432–442, 2020.

[9] M. Wang, **Z. Mo**∗, H. Fu, H. Yu, and Q. Miao∗, "Harmonic l2/l1 norm for bearing fault diagnosis," IEEE Access, vol. 7, pp. 27 313–27 321, 2019.

Conference Proceedings (Peer Reviewed, EI)

[10] **Z. Mo**, J. Wang, H. Zhang, X. Zeng, H. Liu, and Q. Miao∗, "Vibration and acoustics emission based methods in low-speed bearing condition monitoring," in 2018 Prognostics and System Health Management Conference (PHM-Chongqing), IEEE, 2018, pp. 871–875.

Manuscripts (Under Review, Available upon Request)

[11] T. Hu, **Z. Mo**∗, and Z. Zhang∗, "A multi-task pointwise mutual information learning method for bearing remaining useful life predictions facing data domain shift and imbalance," *submitted to IEEE Transactions on Industrial Informatics*, 2024.

[12] T. Hu, **Z. Mo**∗, and Z. Zhang∗, "Neural ode powered model for bearing remaining useful life predictions with intra- and inter-domain shifts," *submitted to Advanced Engineering Informatics*, 2024.

[13] **Z. Mo**, Z. Zhang∗, Q. Miao, and K.-L. Tsui, "Extended invariant risk minimization for machine fault diagnosis with label noise and data shift," *submitted to IEEE Transactions on Neural Networks and Learning Systems*, 2024.

[14] **Z. Mo**, Z. Zhang∗, and K.-L. Tsui, "Domain generalization study of empirical risk minimization from causal perspectives," *submitted to IEEE Transactions on Multimedia*, 2024.

[15] **Z. Mo**, Z. Zhang∗, and K.-L. Tsui, "Lifeisgood: Learning invariant features via in-label swapping for generalizing out-of-distribution in machine fault diagnosis," *submitted to IEEE Transactions on Cybernetics*, 2024.

Project

2024 – 2025 **Development of An AI-Powered Software System for Forecasting the Full Sequence of Day-ahead Wind Power**
Role: *Major Participant*
Type: *ITF-Midstream Research Programmes, Hong Kong Innovation and Technology Commission*
Contributions: *Algorithms related to papers [11], [15]*

2022 – 2023 **Data Science Methods for Offshore Wind Power Forecasting with Considering Multi-source Data**
Role: *Major Participant*
Type: *Guangdong Basic and Applied Basic Research Joint Fund*
Contributions: *Algorithms related to papers [3], [12], [13], [14]*

2020 – 2021 **A Collaborative Data-driven Methodology for Improving Wind Farm Operations and Maintenance**
Role: *Major Participant*
Type: *General Research Fund, Hong Kong Research Grants Council*
Contributions: *Algorithms related to papers [1],[2], [5], [7]*

2017 – 2019 **Vibration Characteristics and Fault Behavior Characterization of Planetary Gearbox with Multiple Fault Coupling**
Role: *Major Participant*
Type: *General Research Fund, National Natural Science Science Fundation of China*
Contributions: *Algorithms related to papers [4], [6], [8]*

Reliability and Evaluation Method of Low-Speed Space Rotating Mechanism
Role: *Major Participant*
Type: *Collaboration with the Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences*
Contributions: *(1) Design of accelerated life test of low-speed space bearing; (2) Data acquisition and pre-processing; (3) Monitored health degradation of low-speed space bearing; (4)Developed a prognostics and health management software; (5) Algorithms related to papers [9], [10]*

Miscellaneous Experience

Award /Achievement /Honor

2024 **ITF Postdoc. Fellowship**, Research Talent Hub for ITF projects, Hong Kong.

2020 **Postgraduate Studentship**, University Grand Committee, Hong Kong.

2019 **The Second Prize CASC Scholarship**, China Aerospace Science and Technology Corporation & Sichuan University, China.

The First Prize Postgraduate Scholarship, Sichuan University, China.

Outstanding Postgraduate , Sichuan University, China.

2018 **Outstanding Postgraduate** , Sichuan University, China.

2017 **The Second Prize Postgraduate Scholarship**, Sichuan University, China.

2016 **The Second Prize FAST Scholarship**, Shaanxi Fast Auto Drive Group Co., Ltd & Huazhong University of Science and Technology, China.

Skill /Others

Software Python, MATALB, C++, LaTeX, AutoCAD, Invertor.

Invited Talks (1) SMC eNewsletter's Student Corner Column (March 2024 Issue); (2) CSIE Postdoc. and Postgraduate Seminar, CityU; (3) PHM-2019 Chongqing, China.