

Yadong Xu

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📅 Sep 1994, Huai'an, Jiangsu, China



Personal Profile

Bio. I am currently a Postdoctoral Researcher in the Department of Industrial & Systems Engineering at Hong Kong Polytechnic University, Hong Kong, working with **Prof. George Q. Huang** (Fellow of IEEE, IISE, ASME, HKIE, IET, and CILT). I earned my PhD degree from the School of Mechanical Engineering at Southeast University in July 2023, under the supervision of **Prof. Beibei Sun**. From 2022 to 2023, I was a Visiting Scholar at the University of British Columbia, Canada, collaborating with **Prof. Zheng Liu** (Fellow of the Engineering Institute of Canada) in the School of Applied Science.

Research interests. My current research work covers a range of issues: **machine condition monitoring, signal processing, deep learning and computer vision**. Currently, I am interested in various deep-learning-based approaches and their applications to condition monitoring and fault diagnosis. I have authored or co-authored over **40 SCI-indexed papers**, including **21 as the first author** and **10 as the corresponding author**. According to Google Scholar, my publications have received **over 1,500 citations** and my H-index is **23**. From 2023 to 2024, I was listed among **the world's top 2% scientists** in the ranking published by Elsevier and Stanford University.

🎓 Education

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|-----------------------|--|
| May 2022 –Apr 2023 | Visiting Scholar in Applied Sciences, <i>University of British Columbia (UBC)</i> , Canada
<i>Supervisor: Prof. Zheng Liu</i> |
| April 2020 –July 2023 | Doctor of Engineering in Mechanical Engineering, <i>Southeast University (SEU)</i> , Nanjing
Institute of Noise and Vibration Control
<i>Supervisor: Prof. Beibei Sun</i> |
| Sep 2017 –Mar 2020 | Master of Engineering , <i>Southeast University (SEU)</i> , Nanjing
Research Center of Condition Monitoring and Fault Diagnosis
<i>Supervisor: Associate Prof. Jianzhong Hu</i> |
| Sep 2012 –Jun 2016 | Bachelor of Engineering , <i>Nanjing Forestry University (NJFU)</i> , Nanjing
Mechanical Design, Manufacturing and Automation
CET-4: 583 CET-6: 573 |

☰ Working Experiences

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| April 2024
Now | Postdoctoral Researcher, Hong Kong Polytechnic University , Hongkong, China
Department of Industrial & Systems Engineering
<i>keyword: Smart Manufacturing & Digital Twin</i> |
| August 2023
March 2024 | Postdoctoral Researcher, Southeast University , Nanjing, China
School of Mechanical Engineering
<i>keyword: Intelligent Manufacturing & Intelligent Sensors</i> |

📖 Ten Representative Publications

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- > **Yadong Xu**, Ke Feng, Xiaoan Yan, Ruqiang Yan, Qing Ni, Beibei Sun, Zihao Lei, Yongchao Zhang, and Zheng Liu, "CFCNN: A novel convolutional fusion framework for collaborative fault identification of rotating machinery," **Information Fusion (JCR Q1, IF = 14.7, ESI Hot Paper, ESI Highly Cited Paper)**, vol. 95, pp. 1-16, 2023.
 - > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Multireceptive Field Denoising Residual Convolutional Networks for Fault Diagnosis," **IEEE Transactions on Industrial Electronics (JCR Q1, IF = 7.5)**, vol.69, no.11, pp.11686-11696, 2022.
 - > **Yadong Xu**, Ke Feng, Xiaoan Yan, Xin Sheng, Beibei Sun, and Ruqiang Yan, "Cross-modal Fusion Convolutional Neural Networks with Online Soft Label Training Strategy for Mechanical Fault Diagnosis," **IEEE Transactions on Industrial Informatics (JCR Q1, IF = 11.7, ESI Highly Cited Paper)**, vol.20, no.1, pp.73-84, 2024.
 - > **Yadong Xu**, Beibei Sun, Ke Feng, Yejian Chen, Yipan Li, Yulin Wang, Xiaoan Yan, and Hongtian Chen, "Online Knowledge Distillation Based Multiscale Threshold Denoising Networks for Fault Diagnosis of Transmission Systems," **IEEE Transactions on Transportation Electrification (JCR Q1, IF = 7.2)**, vol.10, no.2, pp.4421-4431, 2024.
 - > **Yadong Xu**, J.C Ji, Qing Ni, Ke Feng, Michael Beer, and Hongtian Chen, "A Graph-guided Collaborative Convolutional Neural Network for Fault Diagnosis of Electromechanical Systems," **Mechanical Systems and Signal Processing (JCR Q1, IF = 7.9)**, vol.200, pp.110609, 2023.
 - > **Yadong Xu**, J.C Ji, Qing Ni, Ke Feng, Michael Beer, and Yulin Wang, "Global Contextual Feature Aggregation Networks with Multiscale Attention Mechanism for Mechanical Fault Diagnosis Under Non-stationary Conditions," **Mechanical Systems and Signal Processing (JCR Q1, IF = 7.9)**, vol.203, pp.110724 2023. 2023.

- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Deep Coupled Visual Perceptual Networks for Motor Fault Diagnosis Under Nonstationary Conditions," **IEEE/ASME Transactions on Mechatronics (JCR Q1, IF = 6.1)**, vol.27, no.6, pp.4840 - 4850, 2022.
- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Global Contextual Residual Convolutional Neural Networks for Motor Fault Diagnosis Under Variable-speed Conditions," **Reliability Engineering & System Safety (JCR Q1, IF=9.4)**, vol.225, pp.108618, 2022.
- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Attention-based Multiscale Denoising Residual Convolutional Neural Networks for Fault Diagnosis of Rotating Machinery," **Reliability Engineering & System Safety (JCR Q1, IF=9.4)**, vol.226, pp.108714, 2022.
- > **Yadong Xu**, Qiubo Jiang, Sheng Li, Zhiheng Zhao, and George Q. Huang, "Digital Twin-Driven Discriminative Graph Learning Networks for Cross-domain Bearing Fault Recognition," **Computers & Industrial Engineering (JCR Q1, IF = 6.7)**, vol.193, pp.110292, 2024.

Other Selected Publications (* denotes the corresponding author)

- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Dually Attentive Multiscale Networks for Health State Recognition of Rotating Machinery," **Reliability Engineering & System Safety (JCR Q1)**, vol.225, 2022.
- > **Yadong Xu**, Cheng Yang, Beibei Sun, and Xiaoan Yan, "A Novel Multi-scale Fusion Framework for Detail-Preserving Low-light Image Enhancement," **Information Sciences (JCR Q1)**, vol.548, no.16, pp.378-397, 2021.
- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Global Contextual Multiscale Fusion Networks with Online Label Smoothing for Fault Diagnosis Under Noisy and Imbalanced Conditions," **Reliability Engineering & System Safety (JCR Q1)**, vol.231, pp.108972, 2023.
- > **Yadong Xu**, Rui Shu, Ke Feng, Xiaolong Yang, Zhiheng Zhao, and George Q. Huang, "Imbalanced Learning for Gearbox Fault Detection via Attention-Based Multireceptive Field Convolutional Neural Networks With an Adaptive Label Regulation Loss," **IEEE Transactions on Instrumentation and Measurement (JCR Q1)**, vol.73, pp.1-11, 2024.
- > **Yadong Xu**, Sheng Li, Xiaoan Yan, Jianliang He, Qing Ni, Yuxin Sun, and Yulin Wang, "Multi-attention-based Feature Aggregation Convolutional Networks with Dual Focal Loss for Fault Diagnosis of Rotating Machinery Under Data Imbalance Conditions," **IEEE Transactions on Instrumentation and Measurement (JCR Q1)**, vol.73, pp.1-11, 2024.
- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Zheng Liu, "Hierarchical Multiscale Dense Networks for Intelligent Fault Diagnosis of Electromechanical Systems," **IEEE Transactions on Instrumentation and Measurement (JCR Q1)**, vol.71, pp.1-12, 2022.
- > **Yadong Xu**, Rui Shu, Ke Feng, Sheng Li, Xiaolong Yang, Zhiheng Zhao, and George Q. Huang, "Multiperspective Temporal Pooling Convolutional Neural Networks for Fault Diagnosis of Mechanical Transmission Systems" **IEEE Transactions on Instrumentation and Measurement (JCR Q1)**, Accepted, 2024.
- > **Yadong Xu**, and Beibei Sun, "A Novel Variational Model for Detail-Preserving Low-Illumination Image Enhancement," **Signal Processing (JCR Q2)**, vol.195, pp.108468, 2022.
- > **Yadong Xu**, Xiaoan Yan, Beibei Sun, and Jianzhong, "Multi-focus Image Fusion using Learning Based Matting with Sum of the Gaussian-based Modified Laplacian," **Digital Signal Processing (JCR Q2)**, vol.106, 2020.
- > **Yadong Xu** and Beibei Sun, "Color-compensated Multi-scale Exposure Fusion Based on Physical Features," **Optik (JCR Q2)**, vol.223, pp.1-16, 2020.
- > **Yadong Xu** and Jianzhong Hu, "Weak Fault Detection of Rolling Bearing Using A DS-based Adaptive Spectrum Reconstruction Method," **Journal of Instrumentation (JCR Q3)**, vol.14, no.3, pp.3022-3022, 2019.
- > **Yadong Xu**, Ke Feng, Xiaoan Yan and Beibei Sun, "A Multi-dilated Fusion Convolutional Neural Network for Fault Diagnosis of Rolling Bearings," 2023 13th International Conference on Power, Energy and Electrical Engineering (CPEEE). IEEE, 2023: 322-325.
- > **Yadong Xu** and Beibei Sun, "Multiscale Dense Convolutional Networks for Intelligent Fault Diagnosis of Rolling Bearing," 2021 8th International Conference on Dependable Systems and Their Applications (DSA). IEEE, 2021: 114-119.
- > Sheng Li, Qiubo Jiang, **Yadong Xu***, Ke Feng, Yulin Wang, Beibei Sun and Ke Zhang, "Digital Twin-driven Focal Modulation-based Convolutional Network for Intelligent Diagnosis of Bearing Fault," **Reliability Engineering & System Safety (JCR Q1)**, vol.240, pp.109590, 2023.
- > Sheng Li, J.C. Ji, **Yadong Xu***, Xiuquan Sun, Ke Feng, Fengshou Gu, Ke Zhang and Qing Ni, "IFD-MDCN: Multibranch Denoising Convolutional Networks with Improved Flow Direction Strategy for Intelligent Fault Diagnosis of Rolling Bearings Under Noisy Conditions," **Reliability Engineering & System Safety (JCR Q1)**, pp.109387, 2023.
- > Sheng Li, J.C. Ji, **Yadong Xu***, Ke Feng, Michael Beer, Ke Zhang, Qing Ni and Yulin Wang, "Dconformer: A Denoising Convolutional Transformer with Joint Learning Strategy for Intelligent Bearing Fault Diagnosis," **Mechanical Systems and Signal Processing (JCR Q1)**, vol.210, pp.111142, 2024.
- > Sheng Li, **Yadong Xu***, Ke Feng, Beibei Sun, Yulin Wang, Xiaoan Yan, Ke Zhang and Qing Ni, "Joint Threshold Learning Convolutional Networks for Intelligent Diagnosis of Bearing Faults Under Nonstationary Conditions," **IEEE Transactions on Instrumentation and Measurement (JCR Q1)**, vol.72, pp.1-11, 2023.
- > Sheng Li, J.C. Ji, Ke Feng, Qing Ni, Ke Zhang and **Yadong Xu***, "Composite Neuro-Fuzzy System-Guided Cross-Modal Zero-Sample Diagnostic Framework Using Multi-Source Heterogeneous Non-Contact Sensing Data," **IEEE Transactions on Fuzzy Systems (JCR Q1)**, pp.1-12, early access, 2024.
- > Sheng Li, Ke Feng, **Yadong Xu***, Qing Ni and Ke Zhang "Cross-Modal Zero-Sample Fuzzy Diagnostic Framework Using Multi-Source Heterogeneous Non-Contact Sensing Data," **Information Fusion (JCR Q1)**, vol.110, pp.102453, 2024.
- > Rui Shu, **Yadong Xu***, Jianliang He, Zhiheng Zhao, Xiaolong Yang and George Q. Huang, "Multi-view Contrastive Learning

- Framework for Tool Wear Detection with Insufficient Annotated Data," **Advanced Engineering Informatics (JCR Q1)**, vol.62, pp.102666, 2024.
- > Sheng Li, **Yadong Xu***, Ke Feng, and Beibei Sun, "Digital Twin-Assisted Explainable Transfer Learning: A Novel Wavelet-Based Framework for Diagnostics of Bearing Faults From Simulated Domain to Real Industrial Damian" **Advanced Engineering Informatics (JCR Q1)**, vol.62, pp.102681, 2024.
 - > Ke Feng, **Yadong Xu***, Yulin Wang, Qiubo Jiang, Beibei Sun, Jinde Zheng and Qing Ni, "Digital Twin Enabled Domain Adversarial Graph Networks for Bearing Fault Diagnosis" **IEEE Transactions on Industrial Cyber-Physical Systems**, vol.1, pp.113-122, 2023.
 - > Sheng Li, Jianliang He, Rui Shu, Qiubo Jiang, Beibei Sun and **Yadong Xu***, "Digital Twin-driven Attention-guided Convolutional Networks for Bearing Fault Diagnosis Across Different Domains," **Journal of Engineering Manufacture (JCR Q2)**, Accepted, 2024.
 - > Jianliang He, **Yadong Xu**, Yi Pan, and Yulin Wang, "Adaptive Weighted Generative Adversarial Network with Attention Mechanism: A Transfer Data Augmentation Method for Tool Wear Prediction," **Mechanical Systems and Signal Processing (JCR Q1)**, Accepted, 2024.
 - > Xiaolan Yan, Ying Liu, **Yadong Xu**, and Minping Jia, "Multistep forecasting for diurnal wind speed based on hybrid deep learning model with improved singular spectrum decomposition," **Energy Conversion and Management (JCR Q1)**, 2020.
 - > Xiaolan Yan, Daoming She and **Yadong Xu**, "Deep order-wavelet convolutional variational autoencoder for fault identification of rolling bearing under fluctuating speed conditions," **Expert Systems With Applications (JCR Q1)**, 2022.
 - > Xiaolan Yan, Wangji Yan, **Yadong Xu**, and Kaveng Yuen, "Machinery multi-sensor fault diagnosis based on adaptive multivariate feature mode decomposition and multi-attention fusion residual convolutional neural network," **Mechanical Systems and Signal Processing (JCR Q1)**, Accepted, 2023.
 - > Xiaolan Yan, Ying Liu, **Yadong Xu**, and Minping Jia, "Multichannel fault diagnosis of wind turbine driving system using multivariate singular spectrum decomposition and improved Kolmogorov complexity," **Renewable Energy (JCR Q1)**, 2021.
 - > Xiaolan Yan, Daoming She, **Yadong Xu**, and Minping Jia, "Deep regularized variational autoencoder for intelligent fault diagnosis of rotor-bearing system within entire life-cycle process," **Knowledge-Based Systems (JCR Q1)**, 2021.
 - > Yongchao Zhang, Kun Yu, Zihao Lei, Jian Ge, and **Yadong Xu** et al, "Integrated intelligent fault diagnosis approach of offshore wind turbine bearing based on information stream fusion and semi-supervised learning," **Expert Systems with Applications, (JCR Q1)**, 2023.
 - > Xin Sheng, An Liu, Chen Gao, Xi Lu, **Yadong Xu** and Jianrun Zhang, "Radial temperature gradient investigation of the large-diameter ball screw based on mathematical modelling," **International Communications in Heat and Mass Transfer, (JCR Q1)**, 2024.
 - > Sheng Li, Ke Feng, **Yadong Xu***, Qing Ni and Ke Zhang "Cross-Modal Zero-Sample Fuzzy Diagnostic Framework Using Multi-Source Heterogeneous Non-Contact Sensing Data," **Information Fusion (JCR Q1)**, vol.110, pp.102453, 2024.
 - > Xiaolan Yan, Dong Jiang, Ling Xiang, Yadong Xu, and Yulin Wang "CDTFAN: A novel coarse-to-fine dual-scale time-frequency attention fusion network for machinery vibro-acoustic fault diagnosis," **Information Fusion (JCR Q1)**, vol.112, pp. 102554, 2024.

☰ Patents

- > A Fault Diagnosis Method for Rolling Bearings Based on DS Adaptive Spectral Reconstruction, Patent No: ZL 2019 1 0281748.6.
- > An image enhancement method based on scale-aware and detail enhancement model, Patent No: ZL 2019 1 0836624.X.

</> Projects & Experiences

Sep 2024	Jiangsu-Hong Kong-Macao University Alliance (JHMUA) Open Bid Fund, Hongkong & Jiangsu province, Project leader
Sep 2025	<ul style="list-style-type: none"> > Health statue representation and domain-generalized intelligent diagnosis of industrial robotic through fusion of modality perceptiiong. <div style="display: flex; gap: 5px;"> Academic Conference Academic Exchange Robotics </div>
Oct 2023.12	Postdoctoral Fellowship Program of China Postdoctoral Science, GZB20230974, Project leader
Now	<ul style="list-style-type: none"> > Multi-modal representation of robot reducer fault information and digital-analog linkage intelligent diagnosis method for complex working conditions. <div style="display: flex; gap: 5px;"> Fault Diangosis Condition Monitoring Robot Reducer Digital Twin </div>
July 2024	Postdoc Matching Fund Scheme of The Hong Kong Polytechnic University, The Hong Kong Polytechnic University, Project leader
July 2026	<ul style="list-style-type: none"> > Remanufacturing in Industry 5.0. <div style="display: flex; gap: 5px;"> Intelligent Manufacturing Artificial Intelligence Industrial Remanufacturing </div>
May 2022	Chinese Scholarship Council Fellowship, The University of British Columbia, Project leader
April 2023	<ul style="list-style-type: none"> > Visitng scholar at the University of British Columbia, Canada. <div style="display: flex; gap: 5px;"> Predictive Maintenance Deep Learning Intelligent Manufacturing </div>

Oct 2021	Postgraduate Research and Practice Innovation Program of Jiangsu Province, No. SJCX21_0044, Project leader
Oct 2022	> Research on fault diagnosis method and application of rotating machinery based on deep convolutional network. <div style="display: flex; gap: 5px;"> Fault Diagnosis Condition Monitoring Rotating Machinery CNN </div>
Oct 2019 Sep 2022	National Key Research and Development Program of China, No. 2019YFB2006404, Co-investigator > Vehicle integration and engineering demonstration application of construction machinery hub drive system. <div style="display: flex; gap: 5px;"> High Torque Hub System Condition Monitoring Deep Learning Digital Twin </div>
Oct 2021	Jiangsu Industrial and Information Industry Transformation and Upgrading Project, No. 7602006021, Co-investigator
Oct 2023	> Intelligent fault prediction and health management system for equipment in major working conditions. <div style="display: flex; gap: 5px;"> Planetary Gearbox Fault Prediction Knowledge Graph CNN Digital Twin </div>

Journal Service & Conference Organization

Journal Service

Guest editor for Machines (JCR Q2), Electronics(JCR Q2), Symmetry (JCR Q2) and Complex Engineering Systems

Reviewer for the following journals:

Applied Acoustic
Applied Energy
Applied Mathematical Modeling
Applied Intelligence
Applied Sciences
Building and Environment
Digital Signal Processing
Electronics
Expert Systems with Applications
Electronics
IEEE-ASME Transactions on Mechatronics
IEEE Transactions on Instrumentation and Measurement
IEEE Transactions on Industrial Informatics
Information Sciences
ISA Transactions
Measurement
Mechanical Systems and Signal Processing
Mechanism and Machine Theory
Neurocomputing
Signal Processing
Sensors

Conference Organization

Core organizers of the following conferences:

2024 Annual International Conference for Chinese Scholars in Industrial Engineering (CSIE 2024)
2024 IEEE International Conference on Automation in Manufacturing, Transportation and Logistics (iCaMaL2024)

Prizes & Awards

- 2024 Excellent Doctoral Dissertation Award of Jiangsu Province
- 2024 Outstanding PhD Graduate of Southeast University
- 2024 Excellent Doctoral Dissertation Award of Southeast University
- 2023 National Graduate Scholarship of China
- 2022 First-class Academic Scholarship for Doctoral Students of Southeast University.
- 2021 First-class Academic Scholarship for Doctoral Students of Southeast University.
- 2021 Outstanding Graduate of Southeast University.
- 2019 Outstanding Graduate of Southeast University.
- 2017 Second-class Academic Scholarship for Graduate Students of Southeast University.
- 2015 Second Prize in Vocabulary Grammar Contest Nanjing Forestry University.
- Fall** 2015 Outstanding Student of Nanjing Forestry University.
- 2014 The third prize of Jiangsu Higher Mathematics Competition.
- Fall** 2014 Outstanding Student of Nanjing Forestry University.
- Fall** 2013 Outstanding Student of Nanjing Forestry University.