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加拿大西安大略大学机械与材料工程系
英国高等教育学会会士 (FHEA), IEEE 高级会员, 中国机械工程学会高级会员
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教育经历:

- **博士学位（机械工程）**，加拿大不列颠哥伦比亚大学（UBC），2012-2017
- **硕士学位（精密机械与精密仪器）**，中国科学技术大学，2009-2012
- **学士学位（工业工程）**，东南大学，2005-2009

工作经历:

- **副教授**，加拿大西安大略大学（**QS 排名 114**），2023 年 7 月-
- **副教授**，英国兰卡斯特大学（**QS 排名 122**），2022-2023
- **助理教授**，英国兰卡斯特大学, 2019-2022
- **访问研究员**，东京大学工业技术研究院，2019
- **博士后研究员**，加拿大不列颠哥伦比亚大学, 2017-2019

主要研究领域

- 智能制造；工业大数据挖掘；设备状态智能监测；先进传感与信号处理；数字孪生。

主持科研项目:

主持或联合主持科研项目 **12 项**，总经费 **1100 万英镑**，包括 Horizon Europe, Horizon 2020, Innovate UK, Royal Society, NSERC, Mitacs, JSPS 等. 主要项目包括:

- **欧洲造船业的生产和运维优化**
  联合主持，欧盟地平线 2020 项目，经费 500 万欧元，2021 年 4 月至 2024 年 3 月
- **工业 5.0 技术与应用**
  联合主持，欧盟 Horizon Europe 项目，经费 600 万欧元，2022 年 10 月至 2025 年 9 月
- **数字化智能管道自动焊接装备研发**
  主持，英国创新项目，经费 139 万英镑，2023 年 4 月至 2025 年 3 月
- **智能先进增材制造**
  主持，英国创新项目，经费 79 万英镑，2021 年 3 月至 2024 年 2 月
- **AI 辅助的增材制造过程自动化**
  主持，英国创新项目，经费 5 万英镑，2023 年 9 月至 2024 年 9 月
- **智能离岸风场**
  主持，英国皇家学院国际合作项目，经费 1.2 万英镑，2022 年至 2024 年
- **智能离岸风场**
  主持，英国皇家学院国际合作项目，经费 1.2 万英镑，2022 年至 2024 年
- **滚动轴承表面磨损行为机制研究和建模**
  主持，英国皇家学院国际合作项目，经费 1.2 万英镑，2022 年至 2024 年
- **基于分布式智能的工业复杂装备 PHM**
  主持，英国皇家学院国际合作项目，经费 1.2 万英镑，2022 年至 2024 年

学术兼职与服务：

- 国际会议大会主席 (General Chair)：2021 16th International Conference on Computer Science & Education
- 国际会议组织主席 (Organizing Chair)：2019 IEEE International Conference on Automation Science and Engineering
- 国际会议组织主席 (Organizing Chair)：2019 International Young Scientist Forum on Smart Manufacturing and Artificial Intelligence
- 国际会议出版共同主席 (Co-publication Chair)：2020, 2022 15th International Conference on Computer Science & Education
- 国际会议出版主席 (Publication Chair)：2021, 2022, 2023, 2024 International Conference on Machine Vision and Information Technology
- 期刊副编辑（**Associate Editor**）:
     1. **IEEE Transactions on Industrial Informatics** （中科院 **1** 区， IF：**12.3**）
     2. **Journal of Intelligent Manufacturing** （中科院 **1** 区，IF：**8.3** ）
     3. **IEEE Transactions on Instrumentation and Measurement,** (中科院 **2** 区，IF：**5.6**)
     4. Mechatronics System and Control
     5. IET Intelligent Manufacturing
- 客座编委: **IEEE Transactions on Industrial Informatics**, Special Section on "Internet of Things and Artificial Intelligence for Product Life-cycle Management of Complex Equipment"
- 客座编委: **Reliability Engineering and System Safety**, Special Issue on "Reliability Assessment Under Partial Information"
- 客座主编: IEEE Access, Special Section on "Advances in Machine Learning and Cognitive Computing for Industry Applications"
- 客座编委：Shock and Vibration, Special Section on "Intelligent Feature Learning Methods for Machine Condition Monitoring"
- 客座编委: Mobile Networks and Applications, Special Issue on "Cloud-assisted Cyber-Physical Systems for the Implementation of Industry 4.0"
- 客座编委：Electronics, Special Issue on "Smart Sensing, Monitoring, and Control in Industry 4.0"
- 客座编委: IEEE Access, Special Section on "Key Technologies for Smart Factory of Industry 4.0"
- 客座编委：Mechatronics System and Control，Special Issue on "Intelligent control using deep learning and its applications in Assistive systems"
- 期刊审稿人：IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Industrial Electronics, IEEE Transactions on Industrial Informatics, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Reliability, Reliability Engineering and System Safety, IEEE Sensors Journal, Measurement, Journal of Intelligent Manufacturing, Journal of Manufacturing Systems, Future Generation Computer Systems, IEEE Communications Magazine, IEEE Access, Sensors, Journal of Sensors, Computer Networks, Journal of Risk and Reliability, Soft Computing, Transactions on Emerging Telecommunications Technologies, IET Signal Processing, Mobile Networks and Applications, International Journal of Vehicle Design, International Journal of Surface Science and Engineering, Computers and Electrical Engineering, Journal of Internet Technology, etc.

已发表论文：

发表 SCI 期刊论文 60 余篇 (Google Citation 2922, H-index 20)，ESI 热点论文 3 篇，ESI 高被引论文 5 篇：

1. H. Zhou, W. Chen, L. Cheng, J. Liu, and M. Xia, "Trustworthy Fault Diagnosis with Uncertainty Estimation through Evidential Convolutional Neural Networks," *IEEE Trans Industr Inform*, 2023.

2. M. Ma *et al.*, "Computational framework for turbid water single-pixel imaging by polynomial regression and feature enhancement," *IEEE Trans Instrum Meas*, 2023.

3. M. Ma *et al.*, "Direct Noise-Resistant Edge Detection with Edge-Sensitive Single-Pixel Imaging Modulation," *Intelligent Computing*.

4. W. Chen, H. Zhou, L. Cheng, J. Liu, and M. Xia, "Condition monitoring of wind turbine using novel deep learning method and dynamic kernel principal components Mahalanobis distance," *Eng Appl Artif Intell*, vol. 125, p. 106757, 2023.

5. J. Liu, X. Li, R. Pang, and M. Xia, "Dynamic modeling and vibration analysis of a flexible gear transmission system," *Mech Syst Signal Process*, vol. 197, p. 110367, 2023.

6. J. Liu, L. Xue, L. Wang, Z. Shi, and M. Xia, "A new impact model for vibration features of a defective ball bearing," *ISA transactions*, 2023.

7. W. Chen, H. Zhou, L. Cheng, and M. Xia, "Prediction of regional wind power generation using a multi-objective optimized deep learning model with temporal pattern attention," *Energy*, p. 127942, 2023.

8. K. An *et al.*, "Edge Solution for Real-time Motor Fault Diagnosis Based on Efficient Convolutional Neural Network," *IEEE Trans Instrum Meas*, 2023.

9. Q. Wang, C. Guo, H.-N. Dai, and M. Xia, "Variant-Depth Neural Networks for Deblurring Traffic Images in Intelligent Transportation Systems," *IEEE Transactions on Intelligent Transportation Systems*, 2023.

10. F. Jiang, M. Xia, and Y. Hu, "Physics-Informed Machine Learning for Accurate Prediction of Temperature and Melt Pool Dimension in Metal Additive Manufacturing," *3D Print Addit Manuf*, 2023.

11. Y. He *et al.*, "Wire-feed laser additive manufacturing of dissimilar metals via dual molten pool interface interlocking mechanism," *Sci China Technol Sci*, vol. 66, no. 4, pp. 976–986, 2023.

12. H. Zhou, W. Chen, L. Cheng, D. Williams, C. W. De Silva, and M. Xia, "Reliable and Intelligent Fault Diagnosis With Evidential VGG Neural Networks," *IEEE Trans Instrum Meas*, vol. 72, pp. 1–12, 2023.

13. M. Xie, X. Yu, W. Bao, C. Liu, and M. Xia, "Side-Milling-Force Model Considering Tool Runout and Workpiece Deformation," *Electronics*, vol. 12, no. 4, p. 968, 2023.

14. N. Zhao, Y. Su, S. Wang, M. Xia, and C. Liu, "Chatter detection in variable cutting depth side milling using VMD and vibration characteristics analysis," *Electronics*, vol. 11, no. 22, p. 3779, 2022.

15. Q. Li, L. Chen, L. Kong, D. Wang, M. Xia, and C. Shen, "Cross-domain augmentation diagnosis: An adversarial domain-augmented generalization method for fault diagnosis under unseen working conditions," *Reliab Eng Syst Saf*, vol. 234, p. 109171, 2023.

16. X. Zhang, J. Liu, M. Xia, and Y. Hu, "Laser shock peening enables 3D gradient metal structures: A case study on manufacturing self-armored hydrophobic surfaces," *Int J Mach Tools Manuf*, vol. 185, p. 103993, 2023.

17. X. Zhang, M. Xia, C. Zhang, and Y. Hu, "Multistage laser shock improves surface structural properties of aluminum alloy," *Int J Mech Sci*, vol. 245, p. 108101, 2023.

18. Z. Zhao, S. Xu, J. Liu, X. Zhang, M. Xia, and Y. Hu, "Force enhanced wire laser additive manufacturing of aluminum and titanium alloys," *J Alloys Compd*, vol. 938, p. 168617, 2023.

19. X. Song, J. Liu, and M. Xia, "Advanced Vibration-Based Fault Diagnosis and Vibration Control Methods," *Sensors*, vol. 23, no.18, p.7704, 2023.

20. Q. Zhu *et al.*, "Real-Time Quality Inspection of Motor Rotor Using Cost-Effective Intelligent Edge System," *IEEE Internet Things J*, vol. 10, no. 8, pp. 7393–7404, 2022.

21. L. Chen, K. An, D. Huang, X. Wang, M. Xia, and S. Lu, "Noise-Boosted Convolutional Neural Network for Edge-based Motor Fault Diagnosis with Limited Samples," *IEEE Trans Industr Inform*, 2022.

22. W. Chen, H. Zhou, L. Cheng, and M. Xia, "Wind Turbine Blade Icing Diagnosis Using Convolutional LSTM-GRU With Improved African Vultures Optimization," *IEEE Open Journal of Instrumentation and*

Measurement, vol. 1, pp. 1–9, 2022.

23. X. Ding, X. Hou, M. Xia, Y. Ismail, and J. Ye, "Predictions of macroscopic mechanical properties and microscopic cracks of unidirectional fibre-reinforced polymer composites using deep neural network (DNN)," *Compos Struct*, vol. 302, p. 116248, 2022.

24. P. Lyu, P. Zheng, W. Yu, C. Liu, and M. Xia, "A Novel Multiview Sampling-Based Meta Self-Paced Learning Approach for Class-Imbalanced Intelligent Fault Diagnosis," *IEEE Trans Instrum Meas*, vol. 71, pp. 1–12, 2022.

25. H. Zhou, W. Chen, C. Shen, L. Cheng, and M. Xia, "Intelligent machine fault diagnosis with effective denoising using EEMD-ICA-FuzzyEn and CNN," *Int J Prod Res*, pp. 1–13, 2022.

26. J. Liu, X. Zhang, Y. He, Z. Zhao, M. Xia, and Y. Hu, "Suspended water droplet confined laser shock processing at elevated temperatures," *Int J Mach Tools Manuf*, vol. 179, p. 103917, 2022.

27. X. Zhang, J. Liu, M. Xia, and Y. Hu, "Mechanically Enhanced Hydrophobic Metal Surfaces Enabled by 3D Gradient Structures," 2022.

28. J. Liu, Y. He, M. Xia, and Y. Hu, "Ultrahigh strain rate-activated superplastic forming of aluminum and gold nanometals," *Mater Des*, vol. 221, p. 110910, 2022.

29. H. Liu, M. Xia, D. Williams, J. Sun, and H. Yan, "Digital twin-driven machine condition monitoring: A literature review," *J Sens*, vol. 2022, 2022.

30. M. Xia, H. Shao, Z. Huang, Z. Zhao, F. Jiang, and Y. Hu, "Intelligent process monitoring of laser-induced graphene production with deep transfer learning," *IEEE Trans Instrum Meas*, vol. 71, pp. 1–9, 2022.

31. J. Li, C. Shen, L. Kong, D. Wang, M. Xia, and Z. Zhu, "A new adversarial domain generalization network based on class boundary feature detection for bearing fault diagnosis," *IEEE Trans Instrum Meas*, vol. 71, pp. 1–9, 2022.

32. Q. Zhu *et al.*, "Real-time defect detection of die cast rotor in induction motor based on circular flux sensing coils," *IEEE Trans Industr Inform*, vol. 18, no. 12, pp. 9271–9282, 2021.

33. H. Sun, M. Xia, Y. Hu, S. Lu, Y. Liu, and Q. Wang, "A new sorting feature-based temporal convolutional network for remaining useful life prediction of rotating machinery," *Computers and Electrical Engineering*, vol. 95, p. 107413, 2021.

34. H. Shao *et al.*, "Fault diagnosis of a rotor-bearing system under variable rotating speeds using two-stage parameter transfer and infrared thermal images," *IEEE Trans Instrum Meas*, vol. 70, pp. 1–11, 2021.

35. M. Xia, H. Shao, D. Williams, S. Lu, L. Shu, and C. W. de Silva, "Intelligent fault diagnosis of machinery using digital twin-assisted deep transfer learning," *Reliab Eng Syst Saf*, vol. 215, p. 107938, 2021. (**ESI Hot Paper, Highly Cited Paper**)

36. X. Wang *et al.*, "Stray flux-based rotation angle measurement for bearing fault diagnosis in variable-speed BLDC motors," *IEEE Transactions on Energy Conversion*, vol. 36, no. 4, pp. 3156–3166, 2021.

37. L. Chen, Q. Li, C. Shen, J. Zhu, D. Wang, and M. Xia, "Adversarial domain-invariant generalization: A generic domain-regressive framework for bearing fault diagnosis under unseen conditions," *IEEE Trans Industr Inform*, vol. 18, no. 3, pp. 1790–1800, 2021. (**ESI Highly Cited Paper**)

38. H. Shao, M. Xia, J. Wan, and C. W. de Silva, "Modified stacked autoencoder using adaptive Morlet wavelet for intelligent fault diagnosis of rotating machinery," *IEEE/ASME Transactions on Mechatronics*, vol. 27, no. 1, pp. 24–33, 2021. (**ESI Highly Cited Paper**)

39. M. Xia, H. Shao, X. Ma, and C. W. de Silva, "A stacked GRU-RNN-based approach for predicting renewable energy and electricity load for smart grid operation," *IEEE Trans Industr Inform*, vol. 17, no. 10, pp. 7050–7059, 2021. (**ESI Highly Cited Paper**)

40. X. Wang, S. Lu, W. Huang, Q. Wang, S. Zhang, and M. Xia, "Efficient data reduction at the edge of industrial Internet of Things for PMSM bearing fault diagnosis," *IEEE Trans Instrum Meas*, vol. 70, pp. 1–12, 2021.

41. F. Xu, B. Yang, L. Feng, D. Huang, and M. Xia, "Improved interlaminar fracture toughness and electrical

conductivity of CFRPs with non-woven carbon tissue interleaves composed of fibers with different lengths," *Polymers*, vol. 12, no. 4, p. 803, 2020.

42. W. Hong, Z. Xiong, J. You, X. Wu, and M. Xia, "CPIN: Comprehensive present-interest network for CTR prediction," *Expert Syst Appl*, vol. 168, p. 114469, 2021.

43. J. Wen, H. Yao, Z. Ji, B. Wu, and M. Xia, "On fault diagnosis for high-g accelerometers via data-driven models," *IEEE Sens J*, vol. 21, no. 2, pp. 1359–1368, 2020.

44. C. Wang, M. Xia, and M. Q.-H. Meng, "Stable autonomous robotic wheelchair navigation in the environment with slope way," *IEEE Trans Veh Technol*, vol. 69, no. 10, pp. 10759–10771, 2020.

45. H. Shao, M. Xia, G. Han, Y. Zhang, and J. Wan, "Intelligent fault diagnosis of rotor-bearing system under varying working conditions with modified transfer convolutional neural network and thermal images," *IEEE Trans Industr Inform*, vol. 17, no. 5, pp. 3488–3496, 2020. (**ESI Hot Paper, Highly Cited Paper**)

46. X. Wang, C. Shen, M. Xia, D. Wang, J. Zhu, and Z. Zhu, "Multi-scale deep intra-class transfer learning for bearing fault diagnosis," *Reliab Eng Syst Saf*, vol. 202, p. 107050, 2020. (**ESI Highly Cited Paper**)

47. M. Xia, X. Zheng, M. Imran, and M. Shoaib, "Data-driven prognosis method using hybrid deep recurrent neural network," *Appl Soft Comput*, vol. 93, p. 106351, 2020.

48. B. Chen, J. Wan, M. Xia, and Y. Zhang, "Exploring equipment electrocardiogram mechanism for performance degradation monitoring in smart manufacturing," *IEEE/ASME Transactions on Mechatronics*, vol. 25, no. 5, pp. 2276–2286, 2020.

49. Q. Shu, S. Lu, M. Xia, J. Ding, J. Niu, and Y. Liu, "Enhanced feature extraction method for motor fault diagnosis using low-quality vibration data from wireless sensor networks," *Meas Sci Technol*, vol. 31, no. 4, p. 045016, 2020.

50. J. Wan, J. Yang, S. Wang, D. Li, P. Li, and M. Xia, "Cross-network fusion and scheduling for heterogeneous networks in smart factory," *IEEE Trans Industr Inform*, vol. 16, no. 9, pp. 6059–6068, 2019.

51. T. Li, K. Tong, M. Xia, B. Li, and C. W. de Silva, "Information-based hierarchical planning for a mobile sensing network in environmental mapping," *IEEE Syst J*, vol. 14, no. 2, pp. 1692–1703, 2019.

52. X. Li, J. Wan, H.-N. Dai, M. Imran, M. Xia, and A. Celesti, "A hybrid computing solution and resource scheduling strategy for edge computing in smart manufacturing," *IEEE Trans Industr Inform*, vol. 15, no. 7, pp. 4225–4234, 2019.

53. J. Wan and M. Xia, "Cloud-assisted cyber-physical systems for the implementation of Industry 4.0," *Mobile Networks and Applications*, vol. 22, pp. 1157–1158, 2017.

54. M. Xia, T. Li, T. Shu, J. Wan, C. W. De Silva, and Z. Wang, "A two-stage approach for the remaining useful life prediction of bearings using deep neural networks," *IEEE Trans Industr Inform*, vol. 15, no. 6, pp. 3703–3711, 2018. (**Highly Cited Paper**)

55. J. Wan, B. Chen, S. Wang, M. Xia, D. Li, and C. Liu, "Fog computing for energy-aware load balancing and scheduling in smart factory," *IEEE Trans Industr Inform*, vol. 14, no. 10, pp. 4548–4556, 2018.

56. T. Shu, M. Xia, J. Chen, and C. De Silva, "An energy efficient adaptive sampling algorithm in a sensor network for automated water quality monitoring," *Sensors*, vol. 17, no. 11, p. 2551, 2017.

57. M. Xia, T. Li, L. Xu, L. Liu, and C. W. De Silva, "Fault diagnosis for rotating machinery using multiple sensors and convolutional neural networks," *IEEE/ASME transactions on mechatronics*, vol. 23, no. 1, pp. 101–110, 2017. (**ESI Hot Paper, Highly Cited Paper, among most popular papers of TMECH**)

58. T. Li, M. Xia, J. Chen, Y. Zhao, and C. De Silva, "Automated water quality survey and evaluation using an IoT platform with mobile sensor nodes," *Sensors*, vol. 17, no. 8, p. 1735, 2017.

59. M. Xia, T. Li, L. Liu, L. Xu, and C. W. de Silva, "Intelligent fault diagnosis approach with unsupervised feature learning by stacked denoising autoencoder," *IET Science, Measurement & Technology*, vol. 11, no. 6, pp. 687–695,

2017.

60. M. Xia, T. Li, Y. Zhang, and C. W. De Silva, "Closed-loop design evolution of engineering system using condition monitoring through internet of things and cloud computing," *Computer Networks*, vol. 101, pp. 5–18, 2016.

61. J. Xia, S. Wang, X. Wang, M. Xia, K. Xie, and J. Cao, "Multi-view Bayesian spatio-temporal graph neural networks for reliable traffic flow prediction," *International Journal of Machine Learning and Cybernetics*, pp. 1–14, 2022.

部分会议论文：(国际会议Best Paper 2篇)

1. H. Shao, W. Li, **M. Xia***, C. Wang, Q. Guan and T. Xu, "Rotating Machinery Fault Classification using IWGAN-GP and Small Gray Images," 2021 16th International Conference on Computer Science & Education (ICCSE), 2021, pp. 222-227, doi: 10.1109/ICCSE51940.2021.9569392. (**Best Paper Award**)

2. H. Cao, H. Shao, **M. Xia**, W. Luo, F. Zhu and D. Su, "Unsupervised Domain-shared Convolutional Neural Network for Bearing Fault Transfer Diagnosis," *2021 16th International Conference on Computer Science & Education (ICCSE)*, 2021, pp. 216-221, doi: 10.1109/ICCSE51940.2021.9569672.

3. **M. Xia**, T. Li, L. Liu, L. Xu, S. Gao and C. W. de Silva, "Remaining useful life prediction of rotating machinery using hierarchical deep neural network," *2017 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 2017, pp. 2778-2783, doi: 10.1109/SMC.2017.8123047.

4. T. Li, **M. Xia**, J. Chen, S. Gao and C.W.de Silva, "A hexagonal grid-based sampling planner for aquatic environmental monitoring using unmanned surface vehicles," *2017 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 2017, pp. 3683-3688, doi: 10.1109/SMC.2017.8123205.

5. **M. Xia** and C. W. de Silva, "A Framework of Design Weakness Detection through Machine Health Monitoring for the Evolutionary Design Optimization of Multi-Domain Systems", *2014 9th International Conference on Computer Science & Education*, 2014, pp. 205-210, doi: 10.1109/ICCSE.2014.6926455. (**Best Paper Award**)

6. **M. Xia**, F. Kong, and F. Hu, "An Approach for Bearing Fault Diagnosis based on PCA and Multiple Classifier Fusion", *2011 6th IEEE Joint International Information Technology and Artificial Intelligence Conference*, 2011, pp. 321-325, doi: 10.1109/ITAIC.2011.6030215.

部分荣誉和奖励:

- **杰出审稿人, IEEE Transactions on Instrumentation and Measurement,** *2021*
- **Mitacs-JSPS Summer Program Fellowship,** *2019*
- **Mitacs Acceleration Fellowship,** *2015 - 2017*
- **Graduate Student Academic Achievement Award, Department of Mechanical Engineering, UBC,** *2017*
- **Continuing Graduate Student Award, Department of Mechanical Engineering, UBC,** *2016*
- **Student Leadership Award, Department of Mechanical Engineering, UBC,** *2015*