

Xiaodong Jia

CONTACT INFORMATION	Department of Mechanical and Materials Engineering University of Cincinnati 503 Rhodes Hall 513.238.1621 jjaxg@ucmail.uc.edu			
EDUCATION	Ph.D	12/2018	Mechanical Engineering	University of Cincinnati, US
	M.S.	04/2014	Mechanical Engineering	Shanghai Jiaotong University, China
	B.S.	07/2008	Engineering Thermodynamics	Central South University, China
RESEARCH KEYWORDS	<ul style="list-style-type: none">▪ Smart Manufacturing and Maintenance▪ Prognostics and Health Management (PHM)▪ Data-driven Modeling and Intelligent Systems▪ Advanced Process Control (APC)▪ Machine Learning and Data Mining			
	<i>Industrial Applications:</i> Semiconductor Manufacturing; Optical Lens Manufacturing; Wind Energy; Batteries; Rotating Machinery; Metallurgy Devices; Engine Diagnostics and Prognostics;			
ACADEMIC EXPERIENCE	Assistant Professor of Research	Department of Mechanical and Materials Engineering, University of Cincinnati		01/2020-Present
	Adjunct Professor and Post-doc Research Fellow	University of Cincinnati		01/2019-12/2019
	Graduate Research Assistant	NSF/IUCR Center for Intelligent Maintenance System (IMS), University of Cincinnati Advisor: Prof. Jay Lee (Ohio Eminent Scholar, L.W. Scott Alter Chair Professor)		08/2014 – 12/2018
INDUSTRY EXPERIENCE	Project Engineer (Full-time Employee)	Siemens, Shanghai, China		07/2008 – 02/2011
		<ul style="list-style-type: none">- Quality management for the steam turbine design and manufacturing- Project scheduling and project coordination		
	Summer Intern	General Motors, Warren, MI, US		05/2017 – 08/2017
		Baosteel, Shanghai, China		06/2016 – 08/2016
		Shanghai Electric, Shanghai, China		06/2015 – 12/2015
PROJECTS	Research project with <i>Mitsubishi Electric Corporation</i> about health assessment and fault identification fro multi-axis robotic arm	Role: PI; Grant: \$91,801.00		04/2020- 12/2020
	Research project with <i>Hitachi High-Technologies Corporation</i> Phase IV Recipe Optimization Based on Process Sensor Variable Profiles and Etch	Role: PI; Grant: \$54,578.00		04/2020- 09/2020
	Research project with <i>AUO</i> : Application of PHM Methods for Robot Arms and Pumps	Role: Co-PI, Grant: \$ 31,619.00		06/2020 – 09/2020
	Research project with <i>Foxconn</i> (Phase I) on Optical Lens Manufacturing	Project leader		07/2018 – 04/2019
		<ul style="list-style-type: none">- Research on the Artificial Intelligence (AI)-based lens pairing method for optical lens manufacturing.- Research on the smart injection molding system for optical lens manufacturing;		
	Training project with <i>Foxconn</i> on the Industrial Big Data Analysis (Phase II)	Project leader		06/2019 – 09/2019
	Training project with <i>Foxconn</i> on the Industrial Big Data Analysis (Phase I)	Project leader		12/2018 – 02/2019
	Training project with <i>Weichai Power</i> on the Industrial Big Data Analysis	Project leader		03/2019 – 06/2019
	Research project with <i>Applied Materials</i>	Project leader		01/2018 – 12/2018
		<ul style="list-style-type: none">- Development of semi-automated trace segmentation toolkit for semiconductor manufacturing- Fault detection and virtual metrology for semiconductor manufacturing processes		
	Research project with <i>Baosteel.Inc</i>			06/2016 – 08/2017

Project leader

- Health assessment for the continuous steel casting machine;
- Fault diagnosis and prognosis for the gearbox, bearings, and steel rolling machines.

Research project with *Shanghai Electric*

08/2014 – 12/2017

Project leader

- Fault diagnosis and prognosis for wind turbine driven train, pitch system and yaw system
- Wind speed and wind power prediction
- Intelligent power dispatching for offshore wind farms
- Intelligent maintenance scheduling and vessel routing for offshore wind farms

Research project with *HIWIN*

06/2016 – 04/2018

- Design of run-to-failure experiment for the Ballscrew assembly
- Fault diagnosis and prognosis for the Ballscrew assembly based on vibration signal process and intelligent modeling

Research Project with *American Axle & Manufacturing*

08/2016 – 12/2017

- Spindle health monitoring for the Gleason gear cutting machine;

JOURNAL
PUBLICATIONS

[1] H. Dai, **X. Jia**, L. Pahren, J. Lee, and B. Foreman, "Intracranial Pressure Monitoring Signals After Traumatic Brain Injury: A Narrative Overview and Conceptual Data Science Framework," *Frontiers in Neurology*, vol. 11, 2020-August-28 2020.

[2] W. Li, **X. Jia**, X. Li, Y. Wang, and J. Lee, "A Markov model for short term wind speed prediction by integrating the wind acceleration information," *Renewable Energy*, 2020.

[3] H. Cai, **X. Jia**, J. Feng, W. Li, Y.-M. Hsu, and J. Lee, "Gaussian Process Regression for numerical wind speed prediction enhancement," *Renewable Energy*, vol. 146, pp. 2112-2123, 2020.

[4] X. Li, **X. Jia**, Y.-L. Wang, S.-J. Yang, H.-D. Zhao, and J. Lee, "Industrial Remaining Useful Life Prediction by Partial Observation Using Deep Learning with Supervised Attention," *IEEE/ASME Transactions on Mechatronics*, 2020.

[5] Q. Yang, **X. Jia**, X. Li, J. Feng, W. Li, and J. Lee, "Evaluating Feature Selection and Anomaly Detection Methods of Hard Drive Failure Prediction," *IEEE Transactions on Reliability*, 2020.

[6] Y. Wang, **X. Jia**, X. Li, S. Yang, H. Zhao, and J. Lee, "A Machine Vision Based Monitoring System for the LCD Panel Cutting Wheel Degradation," *Procedia Manufacturing*, vol. 48, pp. 49-53, 2020.

[7] S. Yang, X. Li, **X. Jia**, Y. Wang, H. Zhao, and J. Lee, "Deep Learning-Based Intelligent Defect Detection of Cutting Wheels with Industrial Images in Manufacturing," *Procedia Manufacturing*, vol. 48, pp. 902-907, 2020.

[8] X. Li, **X. Jia**, Q. Yang, J. Lee. " Quality analysis in metal additive manufacturing with deep learning, " *Journal of Intelligent Manufacturing*, 2020: 1-15.

[9] H. Cai, **X. Jia***, W. Li, L. Pahren, *et al.*, "A Similarity based Methodology for Machine Prognostics by Using Kernel Two Sample Test," *ISA Transaction*, 2020.

[10] W. Zhang., X. Li., **X. Jia**, H. Ma, Z. Luo. "Machinery Fault Diagnosis with Imbalanced Data Using Deep Generative Adversarial Networks". *Measurement*, 2020, 152: 107377.

[11] X. Li, **X. Jia**, W. Zhang, H. Ma, Z. Luo, X. Li., "Intelligent Cross-Machine Fault Diagnosis Approach with Deep Auto-Encoder and Domain Adaptation". *Neurocomputing*, 2020. 383: 235-247.

[12] P. Li, **X. Jia***, J. Feng, F. Zhu, J. Lee, " A novel scalable method for machine degradation assessment using deep convolutional neural network," *Measurement*, 2020, 151: 107106.

[13] J. Feng, **X. Jia***, F. Zhu, J. Moyne, J. Iskandar, *et al.*, " An Online Virtual Metrology Model with Sample Selection for the Tracking of Dynamic Manufacturing Processes with Slow Drift," *IEEE Transactions on Semiconductor Manufacturing*, 2019, 32(4): 574-582.

[14] J. Feng, **X. Jia***, *et al.* "An intelligent system for offshore wind farm maintenance scheduling optimization considering turbine production loss." *Journal of Intelligent & Fuzzy Systems*, 2019, 1-13.

[15] P. Li, **X. Jia***, M. Sumiya, Y. Kamaji, M. Ishiguro, *et al.*, "A Novel Method for Deposit Accumulation Assessment in Dry Etching Chamber," *IEEE Transactions on Semiconductor Manufacturing*, 2019.

[16] P. Li, **X. Jia***, *et al.*, "A novel scalable method for machine degradation assessment using deep convolutional neural network," *Measurement*, 2019.

[17] H. Cai, **X. Jia***, J. Feng, Q. Yang, Y.-M. Hsu, Y. Chen, *et al.*, "A combined filtering strategy for short term and long-term wind speed prediction with improved accuracy," *Renewable Energy*, vol. 136, pp. 1082-1090, 2019.

[18] Y. Pan, R. Hong, J. Chen, J. Singh, and **X. Jia**, "Performance degradation assessment of a wind turbine gearbox based on multi-sensor data fusion," *Mechanism and Machine Theory*, vol. 137, pp. 509-526, 2019.

[19] H. Cai, **X. Jia***, *et al.*, " Gaussian Process Regression for Numerical Wind Speed Prediction

Enhancement," *Renewable Energy*, 2019.

[20] **X. Jia**, "Data Suitability Assessment and Enhancement for Machine Prognostics and Health Management Using Maximum Mean Discrepancy," University of Cincinnati, 2018.

[21] **X. Jia**, M. Zhao*, Y. Di, Q. Yang, and J. Lee, "Assessment of data suitability for machine prognosis using maximum mean discrepancy," *IEEE transactions on industrial electronics*, vol. 65, pp. 5872-5881, 2017.

[22] **X. Jia***, Y. Di, J. Feng, Q. Yang, H. Dai, and J. Lee, "Adaptive virtual metrology for semiconductor chemical mechanical planarization process using GMDH-type polynomial neural networks," *Journal of Process Control*, vol. 62, pp. 44-54, 2018.

[23] **X. Jia**, M. Zhao*, M. Buzza, Y. Di, and J. Lee, "A geometrical investigation on the generalized l_p/l_q norm for blind deconvolution," *Signal Processing*, vol. 134, pp. 63-69, 2017.

[24] **X. Jia***, C. Jin, M. Buzza, Y. Di, D. Siegel, and J. Lee, "A deviation-based assessment methodology for multiple machine health patterns classification and fault detection," *Mechanical Systems and Signal Processing*, vol. 99, pp. 244-261, 2018.

[25] **X. Jia**, M. Zhao*, Y. Di, P. Li, and J. Lee, "Sparse filtering with the generalized l_p/l_q norm and its applications to the condition monitoring of rotating machinery," *Mechanical Systems and Signal Processing*, vol. 102, pp. 198-213, 2018.

[26] **X. Jia***, C. Jin, M. Buzza, W. Wang, and J. Lee, "Wind turbine performance degradation assessment based on a novel similarity metric for machine performance curves," *Renewable Energy*, vol. 99, pp. 1191-1201, 2016.

[27] **X. Jia**, M. Zhao*, Y. Di, C. Jin, and J. Lee, "Investigation on the kurtosis filter and the derivation of convolutional sparse filter for impulsive signature enhancement," *Journal of Sound and Vibration*, vol. 386, pp. 433-448, 2017.

[28] P. Li, **X. Jia***, J. Feng, H. Davari, G. Qiao, Y. Hwang, et al., "Prognosability study of ball screw degradation using systematic methodology," *Mechanical Systems and Signal Processing*, vol. 109, pp. 45-57, 2018.

[29] M. Zhao, **X. Jia***, J. Lin, Y. Lei, and J. Lee, "Instantaneous speed jitter detection via encoder signal and its application for the diagnosis of planetary gearbox," *Mechanical Systems and Signal Processing*, vol. 98, pp. 16-31, 2018.

[30] M. Zhao and **X. Jia***, "A novel strategy for signal denoising using reweighted SVD and its applications to weak fault feature enhancement of rotating machinery," *Mechanical Systems and Signal Processing*, vol. 94, pp. 129-147, 2017.

[31] Y. Di*, **X. Jia**, and J. Lee, "Enhanced virtual metrology on chemical mechanical planarization process using an integrated model and data-driven approach," *International Journal of Prognostics & Health Management*, vol. 8, 2017.

[32] L. Li, **X. Jia**, and Y. Liu*, "Modified outlet boundary condition schemes for large density ratio lattice Boltzmann models," *Journal of Heat Transfer*, vol. 139, p. 052003, 2017.

[33] L. Li, **X. Jia**, Y. Liu*, and M. Su, "Simulation of double droplets impact on liquid film by a simplified lattice Boltzmann model," *Applied Thermal Engineering*, vol. 98, pp. 656-669, 2016.

[34] **X. Jia**, "Numerical simulation of two-phase flows about droplets and liquid film by using lattice Boltzmann method," *Shanghai Jiaotong University*, 2014 (Master Thesis, Chinese)

[35] **X. Jia**, Y. Liu*, L. Li, and M. Su, "Numerical simulation of falling liquid film based on lattice Boltzmann method," *Journal of Chinese Society of Power Engineering*, pp. 796-800, 2014 (Chinese)

[36] **X. Jia**, Y. Liu*, "Simulation of Droplet Splashing on Flowing Liquid Film by Two-phase Lattice Boltzmann Method," *Science Technology and Engineering*, pp. 5-9, 2014 (Chinese)

[37] L. Li, **X. Jia**, L. Liu* and M. Su, "Simulation of flow process of two droplets with large density ratio impacting on liquid film by two-phase lattice Boltzmann method," *Journal of Chinese Society of Power Engineering*, 457-462, 2015 (Chinese)

CONFERENCE PAPERS	<p>[1] X. Jia, S. Duan, <i>et al.</i> " Methodology for the early diagnosis of vehicle torque converter clutch degradation." <i>2019 IEEE International Conference on Automation Science and Engineering</i>.</p> <p>[2] X. Jia, H. Cai, <i>et al.</i> "A Novel Similarity-based Method for Remaining Useful Life Prediction Using Kernel Two Sample Test." <i>PHM Society Conference</i>. 2019</p> <p>[3] M. Azamfar, X. Jia, <i>et al.</i> " Detection and diagnosis of bottle capping failures based on motor current " <i>47th Annual North American Manufacturing Research Conference, NAMRC 47</i>. 2019.</p> <p>[4] X. Jia, B Huang, <i>et al.</i> "A Review of PHM Data Competitions from 2008 to 2017." PHM Society Conference. Vol. 10. No. 1. 2018.</p>
PRESENTATIONS AND POSTERS	<p>[1] X. Jia, "A Statistical Approach for Wind Turbine Performance Assessment at Fleet Level", <i>IMS Center 29th Industry Advisory Board Meeting</i>, Jun. 9-10, 2015, TechSolve, Cincinnati, OH (Poster)</p> <p>[2] X. Jia, "Weak signature enhancement methods for the prognostics of rotating machinery", <i>IMS Center 31st Industry Advisory Board Meeting</i>, May. 3-4, 2016, Boeing, St Louis, MO (Presentation)</p> <p>[3] X. Jia, "Predictive Metrology for Estimating the Material Removal Rate in Chemical Mechanical Planarization Process", <i>IMS Center 32nd Industry Advisory Board Meeting</i>, Dec. 7, 2016, Samsung, Austin, TX (Presentation)</p> <p>[4] X. Jia, "Data Suitability Assessment for Prognostics and Health Management", <i>IMS Center 34th Industry Advisory Board Meeting</i>, Jan. 25-26, 2018, Intel Corporation, Chandler, AZ (Presentation)</p>
PATENTS	<p>[1] S. Duan, C.J. Lee, Z Zhang, P. Radecki, X. Jia. Torque converter clutch control system health estimation: U.S. Patent Application 16/052,958. 2020-2-6</p>
BOOKS	<p>[1] Jay Lee (2019). Industrial Artificial Intelligence. Shanghai Jiaotong University Press. (Editor) ISBN: 978-7-313-21179-8/F</p>
RESEARCH AWARDS	<p>Champion of PHM Data Challenge 2016, hosted by the PHM society</p> <ul style="list-style-type: none"> - Prediction of Material Removal Rate (MRR) for the Chemical-Mechanical Planarization (CMP) process in semiconductor fabrication. <p>2018 University of Cincinnati Mechanical and Materials Engineering Student Award for Papers</p>
SERVICE	<p>Reviewer</p> <ul style="list-style-type: none"> - IEEE Transactions on Industrial Electronics - IEEE Transactions on Industrial Informatics - IEEE Transactions on Instrumentation and Measurement - IEEE Transactions on Mechatronics - IEEE Transactions on Automation Science and Engineering - Mechanical Systems & Signal Processing - AMSE Journal of Manufacturing Science and Engineering - Journal of Intelligent Manufacturing - Annual Conference of the PHM Society - Mechanism and Machine Theory - Applied Energy - Renewable Energy - Measurement