Xu (Hugh) Han

CONTACT INFORMATION

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EDUCATION

Ph.D.	05/2024 - 10/2025	Mechanical Engineering	University of Cincinnati, US
M.S.	08/2020 - 05/2024	Mechanical Engineering	University of Cincinnati, US
B.S.	08/2015 - 06/2020	Mechanical Engineering	Chongqing University, China
B.S.	08/2015 - 04/2020	Mechanical Engineering	University of Cincinnati, US

RESEARCH KEYWORDS

- Prognostics and Health Management (PHM)
- Smart Manufacturing and Intelligent Metrology

Industries: Ball Screw Diagnosis and Prognosis; Semiconductor Manufacturing;

PROJECTS

Applied Materials: Transfer Learning Based Data Strengthening — 01/2024 – present
- Exploring and developing transfer learning (TL) algorithm using multivariate trace data

University of Southern California: Machine Learning Aided Cardiovascular Disease Diagnosis Using Fundus Images — 09/2023 – present
- Processing and segmenting human fundus images and extracting bio-markers related to cardiovascular disease

National Institute of Standards and Technology (NIST): Preload Estimation for Ball Screw — 07/2023 – present
- Processing the controller and vibration signal and exploring the key indicators of preload degradation based on a dynamics model of ball screw

NIST: Roadmap for Semiconductor Manufacturing in High-Mix Scenario — 05/2023 - present
- Conducting literature reviews and developing draft sections for the roadmap report

United Microelectronics Corporation: Applications of Machine Learning Technique — 08/2022 – 06/2023
- Developed a data-driven Virtual Metrology (VM) utilizing the dual linear Kalman Filter (DLKF) algorithm to enhance the throughput of the current practices

Mitsubishi Electric Corporation — 08/2022 – 11/2023
- Developed the code for data preprocessing for torque data in a fault diagnosis task for industrial robot arms

INDUSTRY EXPERIENCE

CyberInsight Technology Co., Ltd., China — 03/2021 – 06/2022
Algorithm Engineer Intern
- Designed, developed, and deployed a real-time moisture control and parameter optimization system for tobacco dryer machines

FIBERHOME Telecommunication Technologies Co., Ltd, China — 05/2018 – 08/2018
Quality Engineer Intern
- Conducted accelerated life test, destructive test, and root cause analysis for printed circuit boards

PUBLICATIONS

[C1] Han, X., Jia, X., Ji, D. Y., & Lee, J. (2023, May). Designing Robust Topological Features for Wafer Map Pattern Classification. In 2023 34th Annual SEMI Advanced Semiconductor Manufacturing Conference (ASMC) (pp. 1-6). IEEE.

[C2] Han, X, Miller, M., Vogl, G. W., Chen, G., Chou, C., & Jia, X. (2024). Robust Feature Design for Early Detection of Ball Screw Preload Loss. *In 52nd SME North American Manufacturing Research Conference (NAMRC 52, 2024).* (Submitted).

[C3] Rahman, A. U., Han, X., & Jia, X. (2024, June). Enhanced Data-Driven Virtual Metrology on Chemical Mechanical Planarization Process Using Dual Linear Kalman Filter. In *International Manufacturing Science and Engineering Conference*. American Society of Mechanical Engineers. (Submitted)

[J1] Kalaiarasan, V. V., Miller, M., Han, X., Foreman, B., & Jia, X. (2024). A Novel Methodology for Intra-Cranial Pressure Sub-Peak Identification and Morphological Feature Analysis. *IEEE Transactions on biomedical engineering* (Submitted)

[J2] Miller, M., Han, X., & Jia, X. A Novel Methodology for In-Situ Ball Screw Backlash Measurements with Ultra-High Precision. *IEEE transactions on industrial informatics.* (In Progress)

ACTIVITIES

Teaching Assistant
Introduction to Industrial AI (2023 & 2024 Spring semesters)