

Xiaodong Jia (Alex)

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HIGHLIGHTS:

- Research capability on the application of artificial intelligent in machine prognostics
- Strong background in machine learning, especially in Bayesian, Gaussian process and deep learning
- Expert knowledge about rotating system, wind energy, metallurgy and semiconductors

EDUCATION:

University of Cincinnati (UC), US

08/2014 - Now

Ph.D Candidate at Center for Intelligent Maintenance System (IMS)

Advisor: Prof. Jay Lee

Shanghai Jiao Tong University (SJTU), China

09/2011 – 04/2014

M.S. in Mechanical Engineering

Major: Turbomachinery

Central South University (CSU), China

09/2004 – 07/2008

B.S. in Engineering Thermodynamics

WORK EXPERIENCE:

General Motors – Internship

05/2017 – 08/2017

- PHM study on the early detection of torque converter clutch degradation for automatic transmission
- Diagnosis of engine bearing degradation and failures.

Baosteel – Internship

06/2016 – 08/2016

- Develop PHM tools for the continuous casting line to detect potential failures and to assess the machine health condition
- Develop PHM tools for the steel rolling machines to predict and diagnose potential failures

Shanghai Electric – Internship

06/2015 – 12/2015 & 08/2016 – 11/2016

- Develop predictive maintenance tools for on/off-shore wind turbines to reduce the maintenance cost
- Develop prediction tools for the wind speed and power prediction to achieve optimal power dispatching strategies

Siemens – Full time

07/2008 – 02/2011

Title: Project Engineer

- Steam turbine design inspections and manufacturing quality inspections
- Project budget, scheduling and logistics management

HONORS:

1st place at PHM data challenge 2016, hosted by PHM society

Objective: Predict Material Removal Rate (MRR) for the Chemical-Mechanical Planarization (CMP) process in semiconductor fabrication

CURRENT RESEARCH EXPERIENCE AT IMS CENTER:

Project with *Applied Materials*

01/2017 - Present

- Develop semi-automated feature extraction from the trace signal in semiconductor manufacturing process based on time series pattern recognition techniques
- Failure detection for semiconductors based on the semi-automated feature extraction program.

Project with *Baosteel*

06/2016 – Present

- PHM implementations on the continuous casting machine for steel casting process
- Prognostics of gearbox and bearing failures for the rolling machines

Project with *American Axle*

10/2016 – Present

- Prognostics of potential spindle failures and feeding axis failures for the gear cutting tools

Project with *Shanghai Electric*

08/2014 – Present

Phase I:

- Performance degradation assessment for wind turbine based on SCADA data.
- PHM study on the key components of wind turbine, including: drive train, pitch system, yaw system, anemometer, battery and etc.
- Vibration signal processing and condition monitoring for drive train.

Phase II:

- Wind power prediction for the off-shore wind farm
- Intelligent power dispatching strategy based on the wind speed & power prediction results

PROGRAMMING SKILLS:

Matlab, Python(theano, tensorflow), R, Labview;

SUCCESSFUL JOURNAL PAPERS:

[1] *Jia X*, Zhao M, Di Y, et al. Sparse filtering with the generalized l_p/l_q norm and its applications to the condition monitoring of rotating machinery[J]. Mechanical Systems and Signal Processing, 2018, 102: 198-213.

[2] *Jia X*, Jin C, Buzza M, et al. A deviation based assessment methodology for multiple machine health patterns classification and fault detection[J]. Mechanical Systems and Signal Processing, 2018, 99: 244-261.

[3] *Jia X*, Zhao M, Buzza M, et al. A geometrical investigation on the generalized l_p/l_q norm for blind deconvolution[J]. Signal Processing, 2017, 134: 63-69.

[4] *Jia X*, Zhao M, Di Y, et al. Investigation on the kurtosis filter and the derivation of convolutional sparse filter for impulsive signature enhancement[J]. Journal of Sound and Vibration, 2017, 386: 433-448.

[5] *Jia X*, Jin C, Buzza M, et al. Wind turbine performance degradation assessment based on a novel similarity metric for machine performance curves[J]. Renewable Energy, 2016, 99: 1191-1201.

[6] Di Y, *Jia X*, et al. Enhanced Virtual Metrology on Chemical Mechanical Planarization Process using an Integrated Model and Data-Driven Approach, International Journal of Prognostics & Health Management, 2016 (*Under Review*)



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- [7] Zhao M, **Jia X**, et al. Instantaneous speed jitter detection via encoder signal and its application for the diagnosis of planetary gearbox [J], Mechanical System & Signal Processing, (*Under Review*)
- [8] Zhao M, **Jia X**, et al. A novel strategy for signal denoising using reweighted SVD and its applications to weak fault feature enhancement of rotating machinery[J], Mech. Sys. & Sig. Pro
- [9] Li L, **Jia X**, Liu Y. Modified outlet boundary condition schemes for large density ratio lattice Boltzmann models[J]. Journal of Heat Transfer, 2017, 139(5): 052003.
- [10] Li L, **Jia X**, Liu Y, et al. Simulation of double droplets impact on liquid film by a simplified lattice Boltzmann model [J]. Applied Thermal Engineering, 2016, 98: 656-669.