

Hossein Davari Ardakani

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EDUCATION

PhD • Mechanical Engineering • GPA 3.93/4.00

» Area of Focus: Prognostics and Health Management

Advisor: Professor Jay Lee

Relevant Coursework:

- Fourier Transform Techniques
- Topics in Mechanical Engineering: Reliability
- Mechanical Vibrations II
- Mechanical Vibrations III
- Mechanical Vibrations III Lab
- Introduction to E-Manufacturing
- Applied Statistical Inference
- Intelligent Systems and Control
- Applied Regression Analysis
- Intelligent Systems

University of Cincinnati, Cincinnati, OH, USA • Sept. '10 – Present

MSc • Mechanical Engineering • Powertrain • GPA 16.93/20.00

» Thesis: Fault Diagnosis of Gearboxes Using Vibration Analysis and Neural Networks

Tabriz University, Tabriz, Iran • Sept. '06– Feb. '09

BSc • Physics

» Isfahan University, Isfahan, Iran • Sept. '00– July '05

WORK EXPERIENCE

Data Modeling Intern • Goodyear Tire and Rubber Company

Goodyear Innovation Center, Akron, OH, USA • April. '13– Sept. '13

Research Assistant • NSF I/UCRC for Intelligent Maintenance Systems (IMS)

University of Cincinnati, Cincinnati, OH, USA • Jan. '11– Present

Research and develop various Prognostics and Health Management (PHM) methods with industry partners including:

- **Goodyear:** Tire manufacturing process fault detection
 - Leading a team of four researchers that work closely with Goodyear to systematically investigate tire manufacturing data to determine the relationship between the routes each product goes through during its manufacturing and its final quality
 - The goal is to find out the root cause of low-quality tires and finally predict the behavior of the machines for scheduling a preventive maintenance plan
- **Alstom:** Prognostics and health management for railway assets
 - **Point Machines:** Leading a team of three researchers that are collaborating with Alstom to develop a health assessment and condition monitoring system for point machines using the test-bed provided by Alstom.
 - **Track Condition Monitoring:** Leading a team of five researchers working closely with Alstom to develop a track condition monitoring system using vibration and acoustic data collected from a train for multiple trips to detect various types of defects on the tracks.
 - **Traction Motors:** Led a team of three researchers to develop a diagnostics system for winding insulation of the traction motors in Alstom's high-speed trains. The algorithm is being validated for further implementation in Alstom's trains

- **IMS Research:**

- Data quality evaluation for prognostics: contributed to a study of using data quality metrics for algorithm selection for prognostics applications.
- Wind turbine performance assessment: contributed to a team of researchers working on the degradation assessment of wind turbines using data collected from a wind turbine including the output power, wind speed, pitch angle etc.
- Remaining useful life (RUL) prediction of CNC milling machine cutters: developed a RUL prediction method by applying Wavelets and Neural Networks on vibration data collected from the milling machines. The results ranked 3rd in the student category of PHM 2010 data challenge, launched by PHM Society.

TECHNICAL SOFTWARES

MATLAB, LabVIEW, MS Office

PUBLICATIONS

JOURNALS:

- C Jin, AP Ompusunggu, Z Liu, **HD Ardakani**, F Petre, J Lee, Envelope Analysis on Vibration Signals for Stator Winding Fault Early Detection in 3-Phase Induction Motors, *International Journal of Prognostics and Health Management*, (6) 2015.
- D Siegel, **HD Ardakani**, J Lee, YS Chang, J Lee, A review of predictive monitoring approaches and algorithms for material handling systems, *International Journal of Advanced Logistics* 3 (3), 87-99 – 2014
- E Lapira, D Brisset, **HD Ardakani**, D Siegel, J Lee, Wind turbine performance assessment using multi-regime modeling approach, *Renewable Energy* 45, 86-95, (31)2012

BOOK CHAPTERS:

- J Lee, HA Kao, **HD Ardakani**, D Siegel, Intelligent Factory Agents with Predictive Analytics for Asset Management, *Industrial Agents: Emerging Applications of Software Agents in Industry*, 341-360, 2015.
- J Lee, **HD Ardakani**, HA Kao, D Siegel, M Rezvani, Y Chen, Deployment of Prognostics Technologies and Tools for Asset Management: Platforms and Applications, Springer London, 2015

CONFERENCES:

- **HD Ardakani**, Z Liu, J Lee, I Bravo-Imaz, A Arnaiz, Motor current signature analysis for gearbox fault diagnosis in transient speed regimes, *Prognostics and Health Management (PHM), 2015 IEEE Conference on*, 1-6, 2015
- **HD Ardakani**, B Phillips, B Bagheri, J Lee, A New Scheme for Monitoring and Diagnosis of Multistage Manufacturing Processes Using Product Quality Measurements, *Annual Conference of the Prognostics and Health Management Society*, 9-2015.
- C Jin, D Djurdjanovic, **HD Ardakani**, K Wang, M Buzza, B Bagheri, P Brown, J Lee, A comprehensive framework of factory-to-factory dynamic fleet-level prognostics and operation management for geographically distributed assets, *IEEE International Conference on Automation Science and Engineering (CASE)*, 2015.
- C Jin, AP Ompusunggu, Z Liu, **HD Ardakani**, F Petre, J Lee, A Vibration-Based Approach for Stator Winding Fault Diagnosis of Induction Motors: Application of Envelope Analysis, *Annual Conference of the Prognostics and Health Management Society*, 9-2014.
- AP Ompusunggu, Z Liu, **HD Ardakani**, C Jin, F Petre, J Lee, Winding fault diagnosis of a 3-phase induction motor powered by frequency-inverter drive using the current and voltage signals, *The 14th Mechatronics Forum International Conference*, 1-2014
- **HD Ardakani**, C Lucas, D Siegel, S Chang, P Dersin, B Bonnet, J Lee, PHM for railway system—a case study on the health assessment of the point machines, *Prognostics and Health Management (PHM), 2012 IEEE Conference on*, 1-5, 6-2012

HONORS AND AWARDS

Prognostics and Health Management (PHM) Competition 2010: 3rd Place (student)
Nominated for membership in Golden Key International Honor Society, 2012.