



IEEE International Conference on Prognostics and Health Management

2018

2018 IEEE International Conference on Prognostics and Health Management

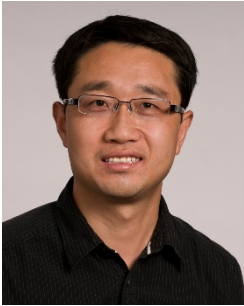
Enhancing Safety, Efficiency, Availability, and Effectiveness of Systems through PHM Technology and Application

Conference Program

June 11-13, 2018

Seattle, WA

MESSAGE FROM THE GENERAL CHAIR



It is my pleasure to welcome you all to the IEEE PHM 2018 Conference in Seattle on June 11-13. The annual IEEE PHM Conference, proudly sponsored by IEEE Reliability Society since 2008, represents one of the largest gatherings of researchers and industry professionals to discuss most recent advancements and applications in PHM. In addition to our regular paper sessions, this year's conference program will feature two keynote speeches, five tutorials, and two panel talks, offered by the globally recognized experts in their respective areas.

Seattle, with its tourist attractions, the diversity and quality of its cuisine, and world-class facilities, is an unforgettable place to visit. It is my hope, therefore, that you could find a chance to explore Seattle and its surroundings. Also, please do not forget to join us to enjoy a Boeing 737 assembly facility tour at the Boeing Renton site on June 14.

A conference of this size could not be organized without the earnest efforts from all our organization committee members. This conference is also indebted to dozens of volunteers who contributed to the various processes that make up the conference. It has been a great privilege for me to serve as the General Chair of IEEE PHM 2018 and I am sure you will find the technical program stimulating and the city of Seattle enjoyable.

I thank you for your kind support to the IEEE PHM 2018 and look forward to seeing you at the conference.

Jie (Peter) Liu

General Chair, IEEE PHM 2018 Conference

PHM 2018 ORGANIZING COMMITTEE

Jie (Peter) Liu, General Chair

Christian Hansen, Arrangements Chair and Past General Chair

Alfred Stevens, Steering Committee Chair and Finance Chair

Steven (Zhaojun) Li, Program Chair

Jason Rupe, Program Vice Chair and Paper Review Chair

Houman Hanachi, Paper Review Vice Chair

Sony Mathew, Tutorial Chair and Keynotes Chair

Rui Zhao, Publicity Chair

Robert Loomis, Proceedings Chair

Hung Nguyen, Webmaster



Monday 6/11/2018	Monday Sessions - Day 1		
8:00 - 17:00 Registration (Summit Foyer)			
7:30-8:30 Breakfast (Summit)			
	Location: Columbia Moderator: Dr. Steven Li	Location: Elliott Moderator: Dr. Jie (Peter) Liu	Location: Peninsula
8:30-10:00	Tutorial M.A.1: Fault Diagnostics and Prognostics Dr. Chiman Kwan, Founder and Chief Technology Officer, Signal Processing Inc., USA	Tutorial M.B.1: New Developments on Diagnostics and Health Management Applied to Unmanned Systems Dr. Youmin Zhang, Professor, Concordia University, Canada	Special Session M.C.1 (PHM for Mission Critical Complex System - 1) Session Chair: Dr. Xiaojian Yi 57: Study on the Method of Determining Accident Probability Based on Failure for Missile System 60: Reliability Analysis of Modular System in MUSER Based on Goal Oriented Methodology: Case Study on LOFAR ARTS 63: Fault prediction of rocket ejection seat based on performance degradation 23: Health Monitoring of IGBTs with a Rule-based Sub-Safety Recognition Model Using Neural Networks
10:00-10:30 Morning Break			
10:30-12:00	Tutorial M.A.2: Data Driven Models for Condition Based Monitoring of Machines Dr. Nishchal K. Verma, Associate Professor, Indian Institute of Technology, Kanpur, India	Tutorial M.B.2: Analytics at Boeing and a Prognostic Example Dr. Zhenqiong Wang, Associated Technical Fellow, Boeing Global Services, The Boeing Company, USA	Special Session M.C.2 (PHM for Mission Critical Complex System - 2) Session Chair: Xiaojian Yi 37: Misfire Detection on Internal Combustion Engine Based on Fluctuation of Exhaust Gas Temperature 70: Research on Feature Extraction Method for Fault Diagnosis of Rolling Bearings Based on Wavelet Packet Decomposition 75: Lithium-Ion battery state of charge estimation based on dynamic neural network and Kalman filter 79: Quantizing the Health State of Railway Axle Bearing via Signal-to-noise Ratio defined by EEMD and SVD
12:00-1:00 Lunch (Summit)			
13:00-14:30	Tutorial M.A.3: Dimensionality Reduction Theories for PHM Dr. Yixiang Huang, Assistant Professor, Shanghai Jiaotong University, China	Panel M.B.3: Deep Learning in Prognostic and Health Management Moderator: Dr. Nishchal K. Verma	Special Session M.C.3 (Advanced Signal Processing for PHM) Session Chair: Dr. Zhiliang Liu 55: Improved Empirical AM and FM Demodulation for Mono-component Signals 20: A fault diagnosis method of planetary gearbox under variable speed condition using Vold-Kalman filter and Laplacian score 50: An improved auto-regression model for representing vibration signals of a gearbox under varying operation condition 127: Perceptual Hashing of Cyclostationary Signal with Sparse Coding
14:30-15:00 Afternoon Break			
	Regular Session M.A.4 (Advanced Prognostics Methods & Application) Session Chair: Dr. Christain Hansen	Regular Session M.B.4 (Gearbox Diagnosis & Prognosis) Session Chair: Dr. Xihui Liang	Panel M.C.4: Big Data in PHM Moderator: Dr. Janet (Jing) Lin
15:00-16:30	134: Automated Lubrication Systems Prognostics Using Long-Term Recurrent Convolutional Networks 88: Recurrent Neural Networks for real-time distributed collaborative prognostics 69: RLCP: A Reinforcement Learning Method for Health Stage Division Using Change Points 142: Uncertainty Prediction of Remaining Useful Life Using Long Short-Term Memory Network Based on Bootstrap Method	7: Unsupervised Feature Learning Of Gearbox Fault Using Stacked Wavelet Auto-encoder 19: Early Detection of Signal Transients Using A Hybrid Signal Processing Method For Gearbox Fault Diagnosis 42: Improved Park's Vector Method and its Application in Planetary Gearbox Fault Diagnosis 99: Dynamic Modeling and Fault Feature Analysis of Pitted Gear System	Panelists: 1. Dr. Diego Galar, Luleå University of Technology 2. Dr. Lishuai Li, City University of Hong Kong 3. Dr. Zongchang Liu, Cybersight Co. Ltd.
18:00-20:00 Welcome Reception (Hilton - Summit)			
Tuesday 6/12/2018	Tuesday Sessions - Day 2		
7:30 - 17:30 Registration (Summit Foyer)			
7:30-8:30 Breakfast (Summit)			
8:30 - 9:00 Conference Opening Dr. Jie (Peter) Liu (General Chair) (Room: Summit)			
9:00 - 10:00 Keynote Equipment and Process Health Management within Aerospace Manufacturing Environment Dr. Al Salour, Boeing Technical Fellow, The Boeing Company, USA (Room: Summit)			
10:00-10:30 Morning Break			
10:30 - 11:30 Keynote Enabling Autonomous Computing – Technology solutions that anticipate and avert failure Dr. William R. Tont, IEEE Fellow, Past IEEE Reliability Society President, USA (Room: Summit)			
12:00 - 13:00 Lunch (Summit)			
	Location: Columbia	Location: Elliott	Location: Peninsula
13:00 - 14:30	Regular Session T.A.1 (RUL Prediction) Session Chair: Dr. Nishchal Verma 26: Remaining useful life prediction for non-Markovian degrading systems with multiple working conditions 11: High Performance Remaining Useful Life Prediction for Gearbox 107: A Monte-Carlo approach for prognostics of clogging process in HVAC filters using a hybrid strategy 141: Prognosis of Diesel Engine (MBT) using Feature Extraction Techniques: A Comparative Study	Regular Session T.B.1 (Maintenance & Condition Monitoring) Session Chair: Dr. Jie (Peter) Liu 74: A method for maintenance decision based on condition monitoring 114: Fusion of Low-level Features with Stacked Autoencoder for Condition based Monitoring of Machines 104: Condition monitoring model of a hydraulic system in truck crane 119: Age replacement model using the parameter estimation of Weibull distribution with censored lifetimes	Special Session T.C.1 (AI for PHM) Session Chair: Dr. Yanfu Li 118: Remaining Useful Life Prediction of Machinery Subjected to Two-Phase Degradation Process 126: Situation Awareness for Cyber-Physical System: a Case Study of Advanced Metering Infrastructure 14: A Bayesian Network Approach for Imbalanced Fault Detection in High Speed Rail Systems 58: Hybrid Architecture for spacecraft diagnosis and its application
14:30-15:00 Afternoon Break			
15:00-16:30	Regular Session T.A.2 (Battery Prognostics) Session Chair: Dr. Xihui Liang 44: An Online State of Health Estimation Method for Lithium-ion Batteries Based on Integrated Voltage 67: Data-driven on-line health assessment for lithium-ion battery with uncertainty presentation 101: Lead-acid battery maintenance using multilayer perceptron models 147: Anomaly Detection during Lithium-ion Battery Qualification Testing	Regular Session T.B.2 (PHM for Wind Turbine) Session Chair: Dr. Steven Li 3: Condition Monitoring of Turbine Generator Using Stator Winding Temperature 89: Diagnostic Models for Wind Turbine Gearbox Components Using SCADA Time Series Data 95: Learning Deep Representation for Blades Icing Fault Detection of Wind Turbines 125: Vibration-Based Rotor-Side-Converter Open-Switch-Fault Detection in DFIGs for Wind Turbines	Special Session T.C.2 (Recent PHM Advances and Applications in Aerospace Engineering) Session Chairs: Dr. Shuguang Song & Dr. Min Xie 112: Embeddings for the Identification of Aircraft Faults (MERIT) 47: PANDA - Discovering Part Name in Noisy Text Data 124: Aircraft Engine Health State Classification Using Stacked Denoising Autoencoder 17: Physics-based Model and Neural Network Model for Monitoring Starter Degradation of APU
17:00 - 21:30 Free Time (no events)			

Wednesday 6/13/2018	Wednesday Sessions - Day 3		
7:30 - 17:30	Registration (Summit Foyer)		
7:30-8:30	Breakfast (Summit)		
	Location: Columbia	Location: Elliott	Location: Peninsula
	Regular Session W.A.1 (Electronics PHM) Session Chair: Mr. Hung Nguyen	Regular Session W.B.1 (PHM Alorithm) Session Chair: Dr. Min Xie	Special Session W.C.1 (PHM for Transportation - 1) Session Chair: Dr. Janet Lin
8:30-10:00	84: Prognosis of Power Connector Disconnect and High Resistance Faults 46: A Condition Monitoring System for Low Vacuum Plasma Spray using Computer Vision 123: Research on the electrical contact resistance (ECR) of connector used in mechanical vibration environment 30: Construction and Workflow of Prognostic and Health Management for Precision Electromechanical System: A Case Study	96: An Accelerated Load Sequence Design Method Based on Merged Markov Matrix 38: A comparative study of Data-driven Prognostic Approaches: Stochastic and Statistical Models 109: Multi-objective Artificial Bee Colony in Mode Separation of Guided Waves for Scattering Coefficient Matrix Reconstruction 24: Equipment Sub-system Extraction and Its Application in Predictive Maintenance	81: A Dynamic Maintenance Strategy for Prognostics and Health Management of Degrading Systems: Application in Locomotive Wheel-sets 76: Reliability-based Usage Strategy Optimization For Lifetime Maximization of Solid-state Lasers 97: Condition Monitoring for the Marine Diesel Engine Economic Performance Analysis with Degradation Contribution 98: Hybrid Cloud Based Cyber-enabled Ship Control and Management System
10:00 - 10:30	Morning Break		
	Regular Session W.A.2 (Structural Diagnostics & Prognostics) Session Chair: Dr. Houman Hanachi	Regular Session W.B.2 (UAV Prgnostics & Diagnostics) Session Chair: Shuguang Song	Special Session W.C.2 (PHM for Transportation - 2) Session Chair: Dr. Janet Lin
10:30-12:00	39: Improving Structural Change Detection using a Differential Equation-based Prediction Model for Condition Monitoring of Rotating Machines 106: One-Class Support Vector Machines for Structural Health Monitoring on Wave Energy Converters 9: Unpowered Wireless Ultrasound Generation and Sensing for Structural Health Monitoring of Composites 54: Analysis on the Fault Trend of Elevator surface damage of Civil Aircraft Flight Control System	8: A High Performance Contingency Planning System for UAV's with Lost Communication 49: Energy Management of Solar UAV Level Flight 52: Study on the structure design of solar powered UAV 62: Gearbox Fault Diagnosis: An Active Learning Method Based on Uncertainty and Complexity	94: Condition monitoring of wheel wear for high speed trains: A data-driven approach 116: Industrial AI enabled prognostics for High-speed Railway Systems 77: A hybrid time-frequency analysis method for railway rolling element bearing fault diagnosis 130: KNN-FSVM for Fault Detection in High-Speed Trains
12:00-13:00	Lunch		
	Regular Session W.A.3 (Bearings Prognostics) Session Chair: Dr. Janet Lin	Regular Session W.B.3 (Bearings Fault Diagnosis) Session Chair: Dr. Xihui Liang	Regular Session W.C.3 (General Topic) Session Chair: Dr. Steven Li
13:00 - 14:30	10: Adaptive Remaining Useful Life Prediction Algorithm for Bearings 80: Lubrication Condition Monitoring and Evaluation of Rolling Bearing Based on Acoustic Emission 103: Approach for the Degradation of Hydrodynamic Journal Bearings based on Acoustic Emission Feature Change 27: Understanding real faults of axle box bearings based on vibration data using decision tree	5: Bearing fault diagnosis based on variational mode decomposition and stochastic resonance 45: Early Fault Diagnosis of Rolling Bearing based Empirical Wavelet Transform and Spectral Kurtosis 59: Elastic Net Representation-based Projections for Bearing Fault Classification 102: Online Bearing Fault Diagnosis using Support Vector Machine and Stacked Auto-Encoder	110: A Dynamic Current Feature Map for Condition Monitoring of Rotating Machinery 122: Temperature sensor data transmission through-metal-wall based on ultrasonic 128: A new non-parametric process capability index 40: Tandem Connectionist Anomaly Detection: Use of Faulty Vibration Signals in Feature Representation Learning
14:30-15:00	Afternoon Break		
	Regular Session W.A.4 (Reliability and PHM) Session Chair: Dr. Houman Hanachi	Regular Session W.B.4 (Fault Diagnosis Approaches) Session Chair: Dr. Jie (Peter) Liu	Regular Session W.C.4 (Diagnosis for Industrial Equipment) Session Chair: Dr. Christian Hansen
15:00-16:30	13: A Text Mining based Reliability Analysis Method in Design Failure Mode and Effect Analysis 65: AK-P: An active learning method combing Kriging and probability density function for reliability analysis 108: Multi-work Condition Modeling and Performance Analysis of Linear Oscillating Actuator 148: An Integrated Method for Estimation with Superimposed Failure Data	35: A New Method of Online Fault Diagnosis Based on Incremental Continuous Attribute Naive Bayesian 129: The Detection of Dc Arc Fault Based on DFA 133: Model-based diagnosis: a frequency domain view 73: An Anomaly Detection and Fault Diagnosis Method for Multi-shaft Speed Sensors	132: A gas path fault diagnostic model for gas turbine based on deep belief network with prior information 31: Aero-Engine Exhaust Gas Temperature Prognostic Model Based on Gated Recurrent Unit Network 86: Dynamics Performance Evaluation and Alarm Method of High-speed Train in Service 61: Fault Isolation and Diagnosis of High Pressure Fuel Pump Solenoid Valves Using Current Feedback
17:00	Bus pickup at Hilton Hotel		
18:00-21:00	Conference Banquet (Museum of Flight)		
21:00	Bus pickup back to hotel		

BOEING TOUR SCHEDULE AND REGULATIONS

Date: June 14

Bus Pickup to Go: 11:00AM at Hilton

Badging and Clearance: 12:00AM – 1:00PM

Facility Tour: 1:00PM – 2:00PM

Bus Pickup to Return: 2:30PM

Return Dropoff: 3:30PM at Hilton

Tour Rules & Regulations: 1) No cameras, video recorders, or camera phones are permitted during the factory visit. 2) The use of electronic devices is restricted while walking in operations and transportation areas. 3) Feet completely covered with low, wide heels. 4) During tours, visitors must adhere to the tour path. 5) No tobacco usage is allowed on company-owned or leased property.

