2017 IEEE International Conference on Prognostics and Health Management

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

Conference Program

June 19-21, 2017

Dallas, TX

MESSAGE FROM THE GENERAL CHAIR

Welcome to PHM 2017 and to Dallas, TX, an exciting city to visit and the perfect venue for our conference. The IEEE Reliability Society (RS) has proudly sponsored this conference since 2008 and I am particularly excited about this year's conference program. We are proud to introduce two internationally recognized keynote speakers and a program full of tutorials, contributed papers, panels and a day-long Internet of Things workshop brought to you in collaboration with the IEEE IoT Technical Community.

I hope you will enjoy both the technical and social interactions in company with fellow experts in PHM from around the world and that you take away much useful information beneficial to your job and/or research.

Be sure to bring your boots and blue jeans for a memorable conference banquet Tuesday night at the legendary Southfork Ranch. Enjoy an authentic Texas style BBQ on one of the world's most famous ranches as we announce and celebrate the winners of the 2017 PHM Conference Best Paper Awards.

Once again welcome, and thank you for your contributions to another successful PHM conference.

Christian K Hansen
IEEE PHM Conference General Chair
IEEE Reliability Society Past President

PHM 2017 ORGANIZING COMMITTEE

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SAVE THE DATE

PHM 2018
Seattle, WA
June 11-13, 2018
Hilton, Seattle Airport and Conference Center

ReliabilitySociety

Monday 6/19/2017	MONDAY SESSIONS		
7:30 - 17:00	**Registration**		
7.30-8:30	**Breakfast**		
	ROOM: COTTONWOOD D **Moderator: Dr. Steven Li**	**ROOM: WATTERS A** **Moderator: Dr. Sony Mathew**	**ROOM: WATTERS B/C** **IOT WORKSHOP** **Chair: Dr. Adam Drobot**
8:30-10:00	Tutorial M.A.1: Monitoring of Safran aircraft engines fleet Dr. Jerome Lacaille (Safran Aircraft Engines, France) Ms. Marion Jedruszek (Safran Aircraft Engines, France)	Tutorial M.B.1: Physics-of-failure algorithms for prognostics of electronics Dr. Michael Osterman (University of Maryland, USA)	Introductions and Opening Remarks Overview of IoT
10:00-10:30	**Morning Break**		
10:30-12:00	Tutorial M.A.2: A tutorial on structural health monitoring Dr. Charles R. Farrar (Los Alamos National Lab, USA)	Tutorial M.B.2: Survival analysis with complex covariates: a model-based clustering preprocessing step Dr. Christophe Biernacki (University of Lille, France) Dr. Vincent Vandewalle (University of Lille, France)	Roundtable Panel and Discussions
12:00-13:30	**Lunch (Cottonwood A)**		
13:30-15:00	Tutorial M.A.3: Deep learning, computational intelligence and health monitoring of machines Prof. Nischal Verma (IIT Kanpur, India)		IoT Technologies and Applications
15:00-15:30	**Afternoon Break**		
	Technical Session M.A.4 (Battery Prognostics) **Session Chair: Dr. Steven Li**	**Technical Session M.B.4 (Bearing System PHM)** **Session Chair: Dr. Yixiang Huang**	Roundtable Discussions and Working Sessions
15:30-17:00	38264: Prognostics of remaining useful life for lithium-ion batteries based on a feature vector selection and relevance vector machine approach	38551: Analysis and application of adaptive difference theory on the demodulating vibration signals of rolling element bearings	
	38870: Lithium-ion battery remaining useful life prediction with deep belief network and relevance vector machine	39272: An improved fusion prognostics method for remaining useful life prediction of bearings	
	39392: Prognostics of lithium ion battery using functional principal component analysis	40749: A feature extraction method based on probabilistic principal components analysis and sampling importance resampling for bearing fault detection	
17:30-20:00	**Welcome Reception (Courtyard)**		

Tuesday 6/20/2017	TUESDAY SESSIONS		
7:30 - 16:30	**Registration**		
7:30-8:30	**Breakfast**		
8:30 - 9:00	**Conference Opening** **Dr. Christian Hansen (General Chair)** **(ROOM: COTTONWOOD D)**		
9:00 - 10:00	**Keynote - 1** **Demystifying big data and data science: challenges, opportunities and path forward for reliability, safety and availability of deployed systems** **Dr. Satyam Priyadarshy - Technology Fellow and Chief Data Scientist, Halliburton, USA** **(ROOM: COTTONWOOD D)**		
10:00-10:30	**Morning Break**		
10:30 - 11:30	**Keynote - 2** **Fusing heterogeneous data for condition based maitenance decisions** **Mr. Subrat Nanda - Analytics Leader, Subsea & Drilling: GE Oil and Gas, USA** **(ROOM: COTTONWOOD D)**		
11:30-13:00	**Lunch (Cottonwood A)**		
	ROOM: COTTONWOOD D	**ROOM: WATTERS A**	**ROOM: WATTERS B/C**
13:00 - 14:30	**Technical Session T. A.1 (Machine Learning)** **Session Chair: Dr. Eric Wong**	**Technical Session T. B.1** **(Engine Health Managment)** **Session Chair: Dr. Houman Hanachi**	**T. C. 1: Nuclear Power System PHM** **Moderator: Dr. Jie Liu (On Behalf of Dr. Jamie Coble)** **Panelists:** **1. Dr. Leonard Bond - Center for Nondestructive Evaluation, Iowa State University** **2. Dr. Vivek Agarwal - Idaho National Laboratory** **3. Dr. Pradeep Ramuhalli - Pacific Northwest National Laboratory** **4. Mr. Randall Bickford - Expert Microsystems Inc.**
	39452: Peak criterion for choosing Gaussian kernel bandwidth in support vector data description (BPA Finalist)	34097: A kind of approach for aero engine gas path fault diagnosis	
	39460: Health-aware hierarchical control for smart manufacturing using reinforcement learning (BPA Finalist)	37883: Air filter diagnostics & prognostics in naturally aspired engines	
	37920: Novelty detection of rotating machinery using a non-parametric machine learning approach	41662: Enhancement of prognostic models for short-term degradation of gas turbines	
14:30-15:00	**Afternoon Break**		
15:00-16:30	**Technical Session T. A. 2.** **(Preventive/Predictive Maintenance)** **Session Chair: Mr. Jian Guo**	**Technical Session T. B. 2 (RUL Prognostics)** **Session Chair: Dr. Pradeep Ramuhalli**	**T. C. 2: Battery Management System** **Moderator: Mr. Rui Zhao** **Panelists:** **1. Dr. Antonio Ginart - Smart Wires Inc.** **2. Dr. Ankur Jain - University of Texas at Arlington 3. Dr. Guangsheng Zhang - Pennsylvania State Univeristy**
	37609: An effective age-based preventive replacement model	42326: Long short-term memory network for remaining useful life estimation (BPA Finalist)	
	38716: Real-time predictive maintenance for wind turbines using big data frameworks	44381: Diagnosis for systems with multi-component wear interactions (BPA Finalist)	
	38918: Advanced correlation-based anomaly detection method for predictive maintenance	39020: Machine remaining useful life prediction considering unit-to-unit variability	
17:00	Bus Pickup at Hotel to Southfork Ranch		
17:30 - 20:30	**Conference Banquet (Southfork Ranch)**		
20:30	Bus pickup back to Hotel		

Wednesday 6/21/2017	WEDNESDAY SESSIONS		
7:30 - 15:00	**Registration**		
7:30-8:30	**Breakfast**		
	ROOM: COTTONWOOD D	**ROOM: WATTERS A**	**ROOM: WATTERS B/C**
8:30-10:00	**Technical Session W. A. 1 (Pump/Air Compressor Diagnostics/Prognostics) Session Chair: Dr. Nishchal Verma**	**Technical Session W. B. 1 (Reasoning and Algorithms) Session Chair: Dr. Sony Mathew**	**Technical Session W. C. 1 (Aircraft Health Managment) Session Chair: Dr. Jian Wang**
	34871: Real-time remote monitoring of an air compressor using MTConnect standard protocol	37663: Damage detection using time-frequency decay-rate based features	37880: Fault feature analysis of civil aircraft control surface damage
	39193: Control adaption approach for fault detection and isolation in SIDI high pressure fuel pump	39055: The research on characteristics of DC arc fault based on HHT	38326: Civil aircraft health mangement research based on big data and deep learning technologies
	38969: Real-time monitoring of machines using open platform communication	39075: Uncertainty quantification in prognostics: a data driven polynomial chaos approach	42141: Research on optimal sensor placement for aircraft structural health management
10:00 - 10:30	**Morning Break**		
10:30-12:00	**Technical Session W. A. 2 (Health Management Architecture) Session Chair: Dr. Jason Rupe**	**Technical Session W. B. 2 (Maintainability and Maintenance) Session Chair: Dr. Houman Hanachi**	**Technical Session W. C. 2 (Electronics/Electricity Load Prognostics) Session Chair: Dr. Christian Hansen**
	39301: Research on CBM information system architecture based on multi-dimensional operation and maintenance data	39339: A method for the maintainability assessment at design stage based on maintainability attributes	39356: An optimal multi-degree open-circuit faults diagnsotic algorithm for photovoltaic system
	39373: Advanced packaging for wireless sensor nodes in cyber-physical systems - impacts of multi-functionality and miniaturization on the environment	39394: Particle filtering based estimation of remaining useful life of lithium-ion batteries employing power fading data	39878: Towards a new health prognostics method for inverters: Power SiC-GTO failures and its precursors
	42337: Model-driven multi-view conceptual architecture design in a PHM system environment	41574: Research of K-Means analysis model on high-speed railway CIR device maintenance	39441: Short-term electricity load forecasting with time series analysis
12:00-13:30	**Lunch (Cottonwood A)**		
13:30 - 15:30	**Technical Session W. A. 3 (Degradation and Performance Evaluation) Session Chair: Dr. Bob Loomis**	**Technical Session W. B. 3 (Rotating Machinery) Session Chair: Dr. Fang Duan**	**Technical Session W. C. 3 (General Topics) Session Chair: Dr. Jie Liu**
	38905: Running state detection and performance evaluation method for feed mechanism of numerical control machine	42480: A performance degradation condition recognition method based on mathematical morphological fractal dimension	38705: Research on electric vehicle (EV) driving range prediction method based on PSO-LSSVM
	38954: A metaheursitic approach for remaining useful life estimation of systems subject to multiple degradation	43490: A comparative study of helicopter planetary bearing diagnosis with vibration and acoustic emission data	39097: Kernelized change detection for cutting force monitoring in machining process
	42159: Performance analysis of a twin shaft industrial gas turbine at fouling conditions	43492: Using independent component analysis scheme for helicopter main gearbox bearing defect identification	39247: Fault sound simulations from normal sounds for data-driven prognosis based on human expert and vibration knowledge
		36315: Visualization method for spectrum analysis of vibration acceleration signals	
15:30	**Conference Adjourn**