2020 IEEE International Conference on Prognostics and Health Management

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

Conference Program

June 8-11, 2020

Virtual Conference

MESSAGE FROM THE GENERAL CHAIR

It is my great pleasure to welcome you all to the IEEE PHM 2020 Conference on June 8-10, 2020. The annual IEEE PHM Conference, proudly sponsored by IEEE Reliability Society since 2008, has become a premier platform for worldwide researchers and industry professionals to get together to discuss most recent advancements and applications in PHM. At these challenging and special times, we are grateful for your strong support and commitment to PHM conference. With your enthusiastic participation and contributions, so we are able to continue the conference this year in an unconventional way.

A conference of this size could not be organized without the earnest efforts from all our organizing 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 2020. I am sure you will find the technical program stimulating and enjoy the exchange of research findings with like minds.

I thank you for your continuous support to the IEEE PHM conference 2020 and look forward to your remote presentations at the conference.

Be safe and stay healthy!

Zhaojun (Steven) Li

General Chair, IEEE PHM 2020 Conference

PHM 2020 ORGANIZING COMMITTEE

Steven Li, General Chair
Christian Hansen, Steering Committee Chair and Finance Chair
Jason Rupe, Program Chair
Yiming Deng, Arrangements Chair
Qiang Miao, Proceedings Chair
Farnoosh Naderkhani, Paper Review Chair
Houman Hanachi, Paper Review Vice Chair
Preeti Chauhan, Tutorial Chair
Rui Zhao, Publicity Chair
Hung Nguyen, Webmaster
Jian (Jay) Guo, Vice Webmaster

IEEE International Conference on Prognostics and Health Management (ICPHM2020)
Zoom Virtual Meeting
June 8-11, 2020
FINAL PROGRAM

Monday 6/8/2020 Eastern Daylight Time	Regular Papers, Day 1, Part 1	Monday 6/8/2020 China Standard Time	Monday 6/8/2020 Central European Summer Time
	Zoom Link and password: please check your email.		
9:00-9:30 AM	**Conference Opening** **Dr.Steven Li** **Conference Planning Committee**	9:00-9:30 PM	3:00-3:30 PM
9:45-11:15 AM	**Regular Session 1** **Machine Learning** **Session Chairs: Farnoosh Naderkhani, Steven Li** 9: Application of Machine Learning Algorithms for Patient Length of Stay Prediction in Emergency Department During Hajj 26: Semi-Supervised Learning Approach for Optimizing Condition-based-Maintenance (CBM) Decisions 28: Integrated Deep Learning and Statistical Process Control for Online Monitoring of Manufacturing Processes 39: Defects tracking via NDE based transfer learning	9:45-11:15 PM	3:45-5:15 PM
11:15 AM - 6:00 PM	**Break**	11:15 PM - 6:00 AM	5:15 PM - 12:00 AM
Monday 6/8/2020 Eastern Daylight Time	Regular Papers, Day 1, Part 2	Tuesday 6/9/2020 China Standard Time	Tuesday 6/9/2020 Central European Summer Time
6:00-7:30 PM	**Regular Session 2** **Systems and Networks** **Session Chairs: Christian Hansen, Yiming Deng** 5: Proactive Network Maintenance using Fast, Accurate Anomaly Localization and Classification on 1-D Data Series 6: Fault Diagnosis for Distributed Cooperative System Using Inductive Logic Programming 30: Building chatbots from large scale domain-specific knowledge bases: challenges and opportunities 37: A Review of Internet of Things (IoT) based Engineering Applications and Data Fusion Challenges for Multi-rate Multi-sensor Systems	6:00-7:30 AM	12:00-1:30 AM
7:30-8:00 PM	**Break**	7:30-8:00 AM	1:30-2:00 AM
8:00-9:30 PM	**Regular Session 3** **Mechanical Systems 1** **Session Chairs: Rui Zhao, Qiang Miao** 10: Visualization of gear-motor shaft whirling feature based on time-series analysis for rotary machine components condition monitoring 11: Adversarial Transfer Learning for Machine Remaining Useful Life Prediction 17: Part and Condition Extraction from Aircraft Maintenance Records 21: Estimating and Leveraging Uncertainties in Deep Learning for Remaining Useful Life Prediction in Mechanical Systems	8:00-9:30 AM	2:00-3:30 AM

IEEE International Conference on Prognostics and Health Management (ICPHM2020)

Tuesday 6/9/2020 Eastern Daylight Time	Regular Papers, Day 2, Part 1			Tuesday 6/9/2020 China Standard Time	Tuesday 6/9/2020 Central European Summer Time
	Zoom Link and password: please check your email.				
8:00-9:30 AM	**Regular Session 4** **Remaining Useful Life** **Session Chairs: Yiming Deng, Farnoosh Naderkhani** 1: A Novel Evaluation Framework for Unsupervised Domain Adaption on Remaining Useful Lifetime Estimation 16: RULENet: End-to-end Learning with the Dual-estimator for Remaining Useful Life Estimation 18: Remaining Useful Life Prediction under Multiple Operation Conditions Based on Domain Adaptive Sparse Auto-Encoder 22: Health Indicator Forecasting for Improving Remaining Useful Life Estimation			8:00-9:30 PM	2:00-3:30 PM
9:30 AM - 10:00 AM	**Break**			9:30 AM - 10:00 PM	3:30 AM - 4:00 PM
10:00-11:30 AM	**Regular Session 5** **Mechanical Systems 2** **Session Chairs: Steven Li, Jason Rupe** 8: Bayesian Neural Network Based Method of Remaining Useful Life Prediction and Uncertainty Quantification for Aircraft Engine 20: Prognostics technique using by classifying degradation stage on Lambda Architecture 29: A Model-Based Method for Fault Detection and Isolation of Electric Drive Systems 31: Unsupervised anomaly detection of the gas turbine operation via convolutional auto-encoder			10:00-11:30 PM	4:00-5:30 PM
11:30 AM - 6:00 PM	**Break**			11:30 PM - 6:00 AM	5:30 PM - 12:00 AM
Tuesday 6/9/2020 Eastern Daylight Time	Regular Papers, Day 2, Part 2			Wednesday 6/10/2020 China Standard Time	Wednesday 6/10/2020 Central European Summer Time
6:00-7:30 PM	**Regular Session 6** **Materials** **Session Chairs: Jason Rupe, Christian Hansen** 4: Road-Deterioration Detection using Road Vibration Data with Machine-Learning Approach 33: Ultrasonic Guided Waves Based Identification of Elastic Properties Using 1D-Convolutional Neural Networks 38: Fatigue damage prognosis in adhesive bonded composite lap-joints using guided waves 41:Application of Long Short-Term Memory Neural Network to Crack Propagation Prognostics			6:00-7:30 AM	12:00-1:30 AM
7:30-8:00 PM	**Break**			7:30-8:00 AM	1:30-2:00 AM
8:00-9:30 PM	**Regular Session 7** **Batteries and Energy Storage** **Session Chairs: Qiang Miao, Jian Guo** 12: Estimating remaining useful life for lithium-ion batteries using kalman filter banks 19: Optimal Operation of Energy Storage Units in PV and Wind Integrated Smart Distribution Systems 23: Life prediction of lithium-ion battery based on random forest optimized by genetic algorithm 36: A Comparison Study of Machine Learning Enabled Filtering Methods for Battery Management			8:00-9:30 AM	2:00-3:30 AM

IEEE International Conference on Prognostics and Health Management (ICPHM2020)

Wednesday 6/10/2020 Eastern Daylight Time	Regular Papers, Day 3, Part 1	Wednesday 6/10/2020 China Standard Time	Wednesday 6/10/2020 Central European Summer Time
	Zoom Link and password: please check your email.		
8:00-9:30 AM	**Regular Session 8** **Neural Networks** **Session Chairs: Steven Li, Farnoosh Naderkhani** 7: Tool Remaining Useful Life Prediction based on Edge Data Processing and LSTM Recurrent Neural Network 15: A Neural Turing Machine-based approach to Remaining Useful Life Estimation 25 Multipath Parallel Hybrid Deep Neural Networks Framework for Remaining Useful Life Estimation 34 Automated detection of textured-surface defects using UNet-based semantic segmentation network	8:00-9:30 PM	2:00-3:30 PM
9:30 AM - 10:00 AM	**Break**	9:30 AM - 10:00 PM	3:30 AM - 4:00 PM
10:00-11:30 AM	**Regular Session 9** **Bearing Prognostics** **Session Chairs: Christian Hansen, Yiming Deng** 3: Intelligent fault diagnosis of bearings based on feature model and Alexnet neural network 12: Bearing Fault Diagnosis Under Variable Speed Based on Iterative TF Curve Extraction and Demodulation 24: Scalable Wind Turbine Generator Bearing Fault Prediction Using Machine Learning: A Case Study	10:00-11:30 PM	4:00-5:30 PM
11:30 AM - 6:00 PM	**Break**	11:30 PM - 6:00 AM	5:30 PM - 12:00 AM
Wednesday 6/10/2020 Eastern Daylight Time	**Regular Papers, Day 3, Part 2**	**Thursday 6/11/2020 China Standard Time**	**Thursday 6/11/2020 Central European Summer Time**
6:00-7:30 PM	**Regular Session 10** **Sample Research Areas** **Session Chairs: Jason Rupe, Rui Zhao** 14: Predicting Surface Roughness and Flank Wear in Turning Processes 27: Designing a Reliability Quick Switching Sampling Plan based on the Lifetime Performance Index 32: Hierarchical Classification for Unknown Faults 40: Extracting Mode Converted Guided Wave Response due to Delamination using Embedded Thin Film Sensors	6:00-7:30 AM	12:00-1:30 AM
7:30-8:30 PM	**Conference Closing** **Dr.Steven Li** **Conference Planning Committee**	7:30-8:30 AM	1:30-2:30 AM

Instructions and FAQ of Remote Presentation using Zoom

ICPHM Virtual Conference June 8-11, 2020

1. Authors will receive the Zoom links to join the sessions.
2. To join the virtual conference through Zoom, a Zoom account is not mandatory. Simply click on the link or copy and paste the link to an internet Brower to attend the online meeting.
3. If you are a presenting author, please join the scheduled session at least 5 minutes before the starting time. Presenters will have 20 minutes for their presentation and are encouraged to use ~15 minutes presenting and ~5 minutes for questions and answers.
4. When joining a Zoom presentation, all participants will enter the session as an "attendee" in listen-only mode and will not be able to turn on their mic or camera. Attendees will use the "Q&A" for any questions they may have during the sessions.
5. Presenters will be promoted to "co-hosts" when it is their turn to present. When prompted by the session moderator, presenters will turn on their mic and camera and share their computer screen. When using PowerPoint or similar presentation tools, presenters are to make sure that the presentation is in "presentation mode" and that the screen being shared is the one showing the presentation (not the note pages or other).
6. Please follow the conference program and schedule to attend the sessions you are interested in. The time slots of the sessions are shown in three major time zones, i.e., United State Eastern Daylight Time (EDT), Beijing Time, and Central Europe Summer Time. **Please map the session times to your local time for on-time attendance and presentation**.
7. The attendee's Zoom account must have a recognizable name that matches the name used on the registration, or the attendee may risk being logged out by the session moderator. Forwarding a Zoom link to someone not registered for the conference is strictly prohibited.
8. **All accepted papers must be presented in order to be published in IEEE XPlore.** "No Show" papers are removed from the final submission of papers to Xplore.
9. Recording a presentation is prohibited without both the author's and the conference general chair's written consent.
10. If you experience any technical issues with joining the meeting or asking questions, please contact the Publicity Chair Dr. Rui Zhao for help. Email address: ruizhao@berkeley.edu. You may also add Dr. Zhao's **wechat account** of *rainjewry* for technical support.
11. For general questions about using the teleconference software Zoom, please refer to the following link: https://support.zoom.us/hc/en-us/articles/206175806-Frequently-Asked-Questions

Technical Support
Dr. Rui Zhao email: ruizhao@berkeley.edu

Photo courtesy of Visit Detroit

The IEEE Reliability Society is seeking original papers for presentation at the 12th
IEEE International Conference on Prognostics and Health Management
(ICPHM 2021)

The 2021 IEEE International PHM Conference will be held in Detroit, Michigan on June 7-9, 2021. PHM is a wide-ranging, interdisciplinary field, that requires an energized exchange of ideas. This conference will match-up world-class expertise in the academic, engineering, and management disciplines to create synergistic exchanges of ideas and practices among academics and industry practitioners. Special attention has been paid to assure a sociable, professional environment to encourage networking, forge new relationships, and deepen existing ones.

PHM topics and applications include but are not limited to:

- Energy Systems
- Electronics Prognostics
- Vehicle Health Management
- Powertrains
- Battery Health Management
- Algorithms and Implementation

- Structures and Materials
- Economics of PHM
- Railway Systems
- Gas Turbines and Rotating Machinery
- Multimode Systems
- Aerospace Systems

Important Dates:

Draft Full Paper Due	February 1, 2021
Notification of Acceptance	March 15, 2021
Author Registration Due	April 15, 2021
Final Manuscript Due	April 15, 2021
Conference Dates	June 7-9, 2021

All presented papers that meet IEEE quality standards will be submitted to
IEEE Xplore® for publication.