3rd International Workshop on Structural Health Monitoring for Railway System (IWSHM-RS)
Qingdao, China
October 22-23, 2020

Technology Validation and System Demonstration

Call for Papers

The 3rd IWSHM-RS will be held in Oct.22-23, 2020 at Qingdao, China. The workshop will be co-hosted by China Railway Society, CRRC Co., Ltd., CRRC Qingdao Sifang Co., Ltd., and CRRC Academy Co., Ltd., etc. The workshop will be organized by the IWSHM-RS International Committee. As an emerging intelligent technology, Structural Health Monitoring technology (SHM) has developed rapidly in various industries in recent years, providing an important guarantee for the safety and efficient automatic operation of different structures. The application of SHM in rail transit system is also increasingly needed. This technology has the potential to optimize operational efficiency while maximizing the reliability of railway systems for the transportation industry into the 21st Century.

The theme of the 3rd IWSHM-RS aims at "Technology Validation and System Demonstration". The Workshop invites researchers from international academia, renowned experts in railway, civil and aviation applications, and delegates from Chinese railway operators, research institutes, rolling stock manufacturers and universities to share recent development and advancements in SHM technology with emphasis on safety and reliability for railway
systems. Owing to your expertise and reputation, you are cordially invited to submit your abstract for participating in the Workshop. The Workshop will feature reviews of current SHM advancements and maturation as well as its perspectives on the impact of the railway industry.

The Workshop will assess and evaluate state-of-the-art SHM technologies that are particularly applicable for railway applications, discuss and identify key emerging technical breakthroughs and challenges. Roadmaps for implementation and international standardization of SHM technology for railway industry will be particularly emphasized. The Workshop is also intended to promote communication exchange and cross-fertilization between multiple disciplines.

The Organizing Committee will set up a review panel and secretariat office to collect and review the papers. Best papers will be selected for prizes and gifts at the Workshop. There will be 1 first prizes, 3 second prizes and 5 third prizes awarded $1000, $500 and $300 respectively. Collaborating with DEstech Publication in US, the Organizing committee will publish a proceeding of selected papers with the EI or Web of Science index. And some excellent papers will be recommended to be published in English academic periodicals and to participate in Excellent papers Selection in Annual Academic Activities of China Railway Society.

World-renown technical experts and the prize-winner for the best papers will be invited for keynote/special presentations. Plenary discussions on the future direction of SHM and potential
applications of SHM to the railway industry will also be organized.

Honorary Chairmen

Chunfang Lu  Chairman, China Railway Society,
Academician of Chinese Academy of Engineering.

Huawu He  Vice President, Chinese Academy of Engineering, Vice Chairman, China Association for Science and Technology, Consultant, China Railway Society.

Yongcai Sun  Executive Director, President, Professor-level Senior Engineer, CRRC Co., Ltd., Vice Chairman, China Railway Society.

Fu-Kuo Chang  Professor of Stanford University, Fellow of AIAA and ASME.

Michael J S Lowe  Professor of Imperial London College, Head of Department of Mechanical Engineering, Fellow of the Royal Academy of Engineering.

Chairmen

Fuhai Ma  Vice Chairman and Secretary General, China Railway Society

Jun Wang  Vice President, CRRC Co., Ltd., Managing Director of China Railway Society.

Executive Chairman

Sansan Ding  Vice-chief Engineer, CRRC Qingdao Sifang Co., Ltd.

The International Workshop on Structural Health Monitoring for Railway System has been held successfully for two sessions, which
attracted hundreds of researchers and renowned experts to discuss the development status and application prospect of SHM in the field of rail transit. The workshop had provided an international and high-level academic exchange and sharing platform for the international academia and industrial community of SHM. It has become the authoritative workshop in the field of Prognostics and Health Management (PHM), SHM in rail transit in China.

**Major Topics**

1. **Applications: Manufacturing/ Sustainability/ Design/ Intelligent Structures**
   - Rolling stock: high-speed train, urban transit vehicles, freight wagons, etc.
   - Civil infrastructure: high-speed railway, freight railway, urban railway and subway railway, etc.

2. **Sensors/ Actuators**
   - Novel sensors, sensor networks, sensors for extreme environments, FBG sensor, AE sensor, piezoelectric, magneto-electric sensors, CNT sensors, micro/nano-sensors, etc.

3. **Sensor Networks/ System Integration**
   - Bio-inspired sensor networks, remote and wireless communication, self-diagnostic networks, self-repairing and fault-tolerance networks, advanced manufacturing for structures with built-in sensors, hardware/software integration, edge computing hardware/software, durability/reliability of sensors and sensor network systems, etc.

4. **Multifunctional Materials and Structures**
- Self-sensing materials, energy harvesting and storage, structures with state awareness

5. Signal Processing/ Monitoring/ Diagnostics
- Advanced signal processing, statistical signal processing, data mining, decision fusion, data-driven approaches such as CNN (Convolution Neural Net), RNN (Reinforced Neural Net), Generative Adversarial network (GAN), AI- compensation methods, etc.

6. Prognostics/Health Management/Condition-based Maintenance+
- Quality control manufacturing, life prediction, integrated structural health management, SHM-based condition assessment of critical structures, etc.

7. Modeling/ Simulations/ SHM-based Design+
- Digital Twin model and its application, Global-local analyses, modeling of sensor/structural responses, manufacturing with sensor data, multi-objective design optimization, SHM-based design, etc.

8. Implementation/ Validation/ Certification
- Quantification techniques, probability of detection (POD), reliability methods, validation/certification processes, etc.

9. SHM "big data" analytics and services.

10. Standard for SHM engineering application.

11. Fault diagnosis/ Fault prognostics.

12. Equipment health management/ Life prediction.

13. Intelligent operation and maintenance technology of EMUs.
## Key Dates

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<tr>
<th>Event</th>
<th>Date</th>
<th>Year</th>
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<tbody>
<tr>
<td>Abstract Submission Due</td>
<td>May 5</td>
<td>2020</td>
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<tr>
<td>Notification of Abstract Acceptance</td>
<td>May 15</td>
<td>2020</td>
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<tr>
<td>Final Paper Submission Due</td>
<td>July 25</td>
<td>2020</td>
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<tr>
<td>Notification of Final Paper Acceptance</td>
<td>September 15</td>
<td>2020</td>
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Workshop Venue: Qingdao

Workshop Website: [www.iwshm-rs.com](http://www.iwshm-rs.com)

Workshop WeChat:

![QR Code](image)

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Appendix

IWSHM-RS International Committee

Organizing Committee

Director

Jingfen Tian  Vice Secretary General of China Railway Society.
Yuebin Yu  Head of Science and Technology Quality Department, CRRC Co., Ltd.

Committee Member

Xueying Hong  Director of Academic Department, China Railway Society.
Lijun Ma  President of CRRC Qingdao Sifang Co., Ltd.
Ming Gong  President of CRRC Academy, Professor-level Senior Engineer.
Fu-kuo Chang  Professor of Stanford University, Fellow of AIAA and ASME.
Ruoshui Chen  Engineer of Academic Department, China Railway Society.
Daojun Ji  Engineer of Academic Department, China Railway Society.

Committee of Experts

Committee Member of Director (The following rank is in alphabetic order)

Matthias Buderath  Head of R&T Management and Technology Maturation.
Rongjun Ding  Academician of Chinese Academy of Engineering, Council Member of China Railway Society.
Huawu He  Vice President of Chinese Academy of Engineering, Vice Chairman of China Association for Science and Technology, Consultant of China Railway Society.
Michael J S Lowe  Professor of Imperial London College, Head of Department of Mechanical Engineering, Fellow of the Royal Academy of Engineering.
Uday Kumar  Professor of Lulea University of Technology, Fellow of Royal Swedish Academy of Engineering Sciences
Chunfang Lu  Chairman of China Railway Society, Academician of Chinese Academy of Engineering.
Jay Lee  Distinguished University Professor at the University of Cincinnati, Founding director of National Science Foundation (NSF) Industry, University Cooperative Research Center (I/UCRC) on Intelligent Maintenance Systems.
Yongcai Sun  Executive Director, President of CRRC Co., Ltd., Professor-level Senior Engineer. Vice Chairman of
China Railway Society.

Hongqi Tian
President of Central South University, Academician of Chinese Academy of Engineering, Consult of China Railway Society.

Xinning Zhang
Chief Engineer of CRRC Co., Ltd., Professor-level Senior Engineer, Council Member of China Railway Society.

Wing Kong Chiu
Professor, Department of Mechanical and Aerospace Engineering, Monash University

Committee Member (The following rank is in alphabetic order)
Liang Chen
Vice-general Manager & Chief Engineer of CRRC Tangshan Co., Ltd.

Du Chen
Vice-general Manager & Chief Engineer of CRRC Qishuyan Co., Ltd.

Keqin Ding
Director of SHM Department, China Special Equipment Inspection and Research Institute (CSEI) and General Manager of Testarc Technology Co., Ltd., CSEI

Jianghua Feng
Director, Vice President and Chief Engineer of CRRC Zhuzhou Locomotive Co., Ltd.

Yong Feng
Vice President of CRRC Qingdao Sifang Rolling Stock Research Institute Co., Ltd.

Xin Guo
Vice President of CRRC Nanjing Puzhen Co., Ltd.

Chuan He
Vice President of Southwest Jiaotong University.

Xuhong Hu
Vice Chief Engineer of China Railway Design Corporation.

Limin Jia
Chief Professor of Beijing Jiaotong University.

Dongkai Li
Deputy Director of Locomotive & Car Department, China Railway.

Baoming Liu
Director of National Innovation Center for High Speed Train, Council Member of China Railway Society.

Changqing Liu
Vice President & Chief Engineer of CRRC Changchun Railway Vehicles Co., Ltd.

Jianying Liang
Vice President & Chief Engineer of CRRC Qingdao Sifang Co., Ltd.

Dennis Roach
Senior Tech Fellow of Sandia National Laboratory.

Yiqing Ni
Professor of Hong Kong Polytechnic University, doctoral supervisor, convener of Railway Engineer interdisciplinary research at HKPU.

Peter Xinlin Qing
National “The Recruitment Program of Global Experts” distinguished experts; distinguished professor, Department of Aeronautics and Astronautics, Xiamen University.
Ming Qian  Director of Locomotive & Car Department, China Railway.
Ruiming Ren  Vice President of Dalian Jiaotong University, Council Member of China Railway Society.
Wei Shan  Deputy Director of Locomotive & Car Department, China Railway.
Jianguo Suo  Vice President & Chief Engineer of CRRC Zhuzhou Locomotive Co., Ltd.
Shiji Song  Professor of Tsinghua University, doctoral supervisor.
Litian Wang  Chief Engineer of China Railway Electrification Survey Design & Research Institute Co., Ltd.
Xiaofeng Wang  Vice President & Chief Engineer of CRRC Sifang Co., Ltd.
Paulo Anchieta da Silva  Engineering Supervisor, Technology Development of Smart Structures R&D, Embraer.
Guotang Zhao  Director, Department of Science and Information of China Railway, Vice Chairman of China Railway Society
Hongwei Zhao  Chief Engineer of China Academy of Railway Sciences Co., Ltd.
Bo Zhang  Deputy Director of Locomotive & Car Department of China Academy of Railway Sciences.
Zhihui Zhang  Chief Engineer of China Railway Signal & Communication Co., Ltd., Council Member of China Railway Society.

(To Be Updated)