Special Session: Fault prognosis and predictive maintenance of energy infrastructures

Fault prognosis and predictive maintenance is to find the most feasible, economical, and easy-to-follow operation and maintenance solutions for modern energy infrastructure assets with the assistance of recent emerged techniques. However, the existing concepts, ideas, models, methodologies, and tools can hardly be applied to the newly emerged energy assets. For instance, electromagnetic radiation reduces the reliability of generators, harsh sea conditions introduce additional unsafe factors to offshore energy facilities, vibrations and extreme operational temperature cycles weaken the resistance of electrical and tiny mechanical elements of energy production systems. Accordingly, finding out appropriate fault prognosis and predictive maintenance solutions for recent energy infrastructures becomes important for the safe, reliable, and economical management of such systems, which can be an integrated decision-making problem considering, not limited to, structural analysis, sensor optimization, fault prognosis and prognosis model construction, failure prevention and reliability issues, as well as maintenance planning and optimization.

Hence, there is a surging demand to converge the state-of-the-art solutions on the above aspects and provide feasible thinking to guide performance improvement and profit increase of energy assets especially those subjected to uncertain environmental and operational factors. To this end, this special session is arranged for presenting original research papers dealing with newly emerged fault prognosis and predictive maintenance solutions of energy infrastructure assets to provide academia with innovative ideas and engineering with the most recent interesting applications. The topics related to this Special Session include, but is not limited to:

- Data analysis support fault prognosis and predictive maintenance
- Sensor platform analysis, sensor configuration design and optimization
- Fault prognosis models and their applications
- Condition based maintenance
- Preventive maintenance
- Maintenance resources arrangement and decision-making tools

Chairs:

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Dr. Li works at the Centre for Marine Technology and Ocean Engineering (CENTEC), Instituto Superior Técnico, University of Lisbon, Portugal. His research mainly focuses on the failure, risk, reliability, and maintainability of complex systems such as floating offshore wind turbines. Dr. He Li has published two books (with Springer) and more than 30 peer-reviewed papers, including 4 highly cited papers and 1 hot paper, in Renewable Energy, Reliability Engineering & System Safety, Applied Soft Computing, Ocean Engineering, and so forth. He is the winner of the world's prominent design award A'Design (Product Engineering and technical Design-Gold Award). Dr. He Li is the associate editor, guest editor, and member of the editorial board of 8 Journals and has been special session chair, organization committee co-chair, and program committee member of several international conferences, totally, more than 20 times.

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Dr. Ke Feng is a Marie Curie Fellow (Imperial College London & Brunel University London). He received a PhD degree in mechanical engineering from the University of New South Wales, Australia, in 2021. He works as Research Fellow at the University of British Columbia and the National University of Singapore in 2022 and 2023, respectively. His main research interests include digital-twin-based RUL prediction, vibration analysis, structural health monitoring, dynamics, tribology, signal processing, and machine learning. He is a Fellow of Vebleo. And he is the editor and guest editor of several journals, including Mechanical Systems and Signal Processing, IEEE Transactions on Industrial Cyber-Physical Systems, Engineering Applications of Artificial Intelligence, IEEE Transactions on Instrumentation and Measurement, Measurement, Measurement Science and Technology, etc.

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Dr. Xu is a Marie Curie Fellow and works at the Liverpool Logistics Offshore and Marine Research Institute (LOOM) and Mechanical Engineering and Materials Research Centre (MEMARC), School of Engineering, Liverpool John Moores University, United Kingdom. He is going to study fault diagnosis and prognosis for floating offshore wind turbine funded by Marie Sklodowska-Curie Actions (MSCA) Postdoctoral Fellowship. His research interests are computational dynamics, structure fatigue and fracture, deep learning application around fault diagnosis and prognosis. Dr. Xu has published more than 40 peer-reviewed papers including journal of Information Fusion, Renewable Energy, ISA Transactions, Applied Soft Computing, and so forth.

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Mohammad Yazd is a Top 2% scientist in career (2017-2021) and is an accomplished senior researcher at Macquarie University in Australia. He holds a dual Ph.D. from Memorial University of Newfoundland in Canada and Macquarie University in Australia. Prior to his academic career, Mohammad served as a Safety Expert and Auditor in the oil and gas industry from 2012 to 2016. Mohammad has published three books and more than 100 papers in risk assessment and mitigation in various fields. Dr. Mohammad Yazdi is the managing editor, associate editor, guest editor of several Journals and has been special session chair, and technical program committee member of several international conferences. he has collaborated as a researcher and consultant in project, operation, and asset integrity management in both academia and the industrial sector

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Dr. Xuanlie Zhao is an Associate Professor at the College of Shipbuilding Engineering, Harbin Engineering University, China. He serves as the Deputy Director of the MIIT Key Laboratory of Deep-sea Engineering Equipment and Technology. His research interests encompass wave-structure interactions, offshore renewable energy, and multi-functional marine structures. As Principal Investigator, Dr. Zhao has led five projects, including 2 projects funded by the National Natural Science Foundation of China (NSFC). He has also been involved in several key projects sponsored by the Ministry of Science and Technology (MOST), the Ministry of Industry and Information Technology (MIIT), and various industries. Dr. Zhao has published over 30 papers with more than 700 citations and serves as a reviewer for over 20 journals and conferences. He was selected for the 6th Young Elite Scientist Sponsorship Program by the CAST.