

Special issue of the Asia Pacific Conference of the Prognostics and Health Management Society 2021

Preface

Prognostics and Health Management (PHM) is an enabling discipline that permits the reliability of a system to be evaluated (health) and predicted (prognostics) in its actual application conditions. In recent years, PHM has been implemented across industries, including manufacturing, automotive, and aerospace, as a means to provide an early warning of failure; to forecast maintenance as needed; to reduce maintenance cycles; to assess the potential for life extensions; and to improve future designs and qualification methods. In order to consolidate the state-of-the-art knowledge and findings, the second biannual Asia Pacific conference of the PHM society (PHMAP21) was held at Ramada Plaza Hotel in Jeju Island, South Korea from 8th to 10th of September, 2021. Despite the COVID-19 crisis, the conference was a great success featured by more than 290 participants from 10 countries, 3 keynote speeches by renowned scholars, 9 invited lectures, 4 tutorials, and 2 panel sessions.

This special issue of the International Journal of Smart Structures and Systems includes 6 peer-reviewed manuscripts from the PHMAP21 conference. The topics of the manuscripts in this special issue cover the most of the PHM application processes, from feature extraction to prognosis, as well as from theoretical and simulation-based studies to practical and experimental applications. Lee, Baek, et al. discussed the process for extracting features for metal additive manufacturing product warpage prediction. In terms of diagnosis, Kim, et al. and Bae, et al. presented the methods for fault detection in permanent magnet synchronous machine and ball bearing, respectively. Lee, Chang, et al. developed a deep learning-based approach to localize multiple acoustic sources in a 3D spherical target map. Lee, Kim, et al. predicted the remaining useful life of permanent magnet synchronous machine using particle filter. In addition to these experimental applications, Zhang, et al., proposed a fault propagation analysis method for complex systems based on theoretical system modeling.

The guest editors of this special issue believe these 6 papers have provided a good representation of the recent PHM research addressed by academia, as well as industry. Furthermore, the guest editors would like to appreciate the reviewers for their commitment and dedication towards their rigorous and constructive reviews.

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