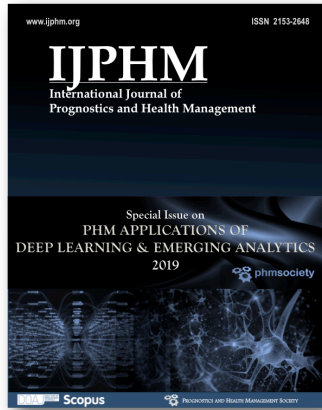


Special Issue of the
International Journal of Prognostics and Health Management
PHM Applications of Deep Learning & Emerging Analytics



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The International Journal of Prognostics and Health Management (ijPHM) is the premier journal of multidisciplinary research on Prognostics, Diagnostics, and System Health Management. ijPHM is online, open access, and has no fees whatsoever to publish.

This special issue focuses on theory and application of deep learning and advanced analytics to anomaly detection, condition monitoring, diagnostics, and prognostics.

Deep learning has recently achieved significant breakthroughs in many different domains, including computer vision, language processing, genomics, and speech recognition; e.g., AlphaGo and AlphaZero have achieved super-human performance in complex games without human input. Despite these encouraging results, these techniques have seen little adoption by industry for PHM applications. There are several obstacles that need to be surmounted to enable the broad adoption of deep learning for PHM:

- Limited number of representative training samples, particularly for different types of faulty conditions and representative time-to-failure trajectories
- Appropriate benchmark datasets to compare the progress of newly developed algorithms
- Variability of operating and environmental conditions to appropriately transfer the learnt patterns between different operating conditions
- Heterogeneity of condition monitoring signals, system configurations, and operating conditions

Moreover, a number of emerging technologies – such as quantum computing, distributed ledger, blockchain, edge computing, mixed reality, explainable AI, and smart dust – hold great potential, and will undoubtedly have a profound effect on the research and application of PHM. People already doing work in these areas are truly on the cutting edge of the field.

Topics of Interest:

The focus of this special issue is to provide a forum for PHM researchers and practitioners to share work and discuss the potential, applicability, benefits, challenges, and current obstacles of deep learning and emerging analytics for PHM applications. Papers describing both novel applications and related theory are encouraged, with special focus on best practices for addressing challenging industrial problems and innovative applications of techniques matured outside of PHM. We are soliciting papers on topics that include, but are not limited to:

- 1) Applications of deep learning and emerging analytics to PHM, focusing on how breakthroughs in other domains can be leveraged for fault detection, diagnostics, and prognostics; and what needs to be done to enable them to unleash their potential in industrial applications. The use of hybrid approaches, combining physics-based models and machine learning techniques is particularly interesting in this context.
- 2) Innovative applications of deep learning and emerging analytics that are able to solve problems not currently sufficiently addressed using traditional PHM approaches, or that are able to overcome some of the limitations faced by traditional approaches.

Submission Instructions: Please submit abstracts and manuscripts at www.ijphm.org. The manuscript template and instructions for authors is also available there.

Selected papers will be invited to present their research in a special session during the PHM 2019 conference to enable broader discussions.

Abstracts Due: 31 March 2019

Final Full Papers Due: 15 June 2019