A systematic literature review of machine learning methods applied to predictive maintenance

F. A. A. M. N. Soares; J.P. Tavares Vieira Basto; R. Vita; R.P. Francisco; S. Gomes Soares Alcalá; T.P. Carvalho

Abstract-

The amount of data extracted from production processes has increased exponentially due to the proliferation of sensing technologies. When processed and analyzed, data can bring out valuable information and knowledge from manufacturing process, production system and equipment. In industries, equipment maintenance is an important key, and affects the operation time of equipment and its efficiency. Thus, equipment faults need to be identified and solved, avoiding shutdown in the production processes. Machine Learning (ML) methods have been emerged as a promising tool in Predictive Maintenance (PdM) applications to prevent failures in equipment that make up the production lines in the factory floor. However, the performance of PdM applications depends on the appropriate choice of the ML method. The aim of this paper is to present a systematic literature review of ML methods applied to PdM, showing which are being explored in this field and the performance of the current state-of-the-art ML techniques. This review focuses on two scientific databases and provides a useful foundation on the ML techniques, their main results, challenges and opportunities, as well as it supports new research works in the PdM field.

Index Terms- Predictive maintenance; Machine learning; PdM; Systematic literature review; Artificial intelligence