CONDITIONAL MONITORING OF INDUSTRIAL PROCESSES WITH DEEP NEURAL NETWORKS

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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In this paper a condition monitoring an in industrial processes is made with deep learning algorithm, with data served from IEEE PHM Challenge of the bearings' degrading life. To provide the best many-to-many type of learning process, sequential type of deep learning is chosen such as Long-Short Term Memory (LSTM), Gated Recurrent Unit (GRU), Encoder-Decoder Model, and Sequence to Sequence Attention Model will be used to make Remaining Useful Life (RUL) prediction based on the actual RUL of the tested bearings with end-to-end approach. Comparison and discussion will be written in detail.

Keywords: deep learning, process monitoring, sequential, regression, many to many, data reconstruction, long-short term memory, absolute prediction error, gated recurrent unit, encoder decoder neural network, attention, tensorflow, keras, python, bearing remaining useful life, prognostics, data driven methodology.

DEDICATION

I dedicate this work for me and my family who has supported me through all the obstacles and roots of my career, also for the future of my beloved country, Indonesia.

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