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Project Type : Minor

Project Title: Predictive Maintenance for Water Pumps

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Project Abstract: A significant prospect and utmost heed is given to Predictive Maintenance (PdM) and Machine Learning (ML). Both fields are evolving and need extensive research. This report has primarily managed to capture information regarding various ML approaches and especially the potential of Recurrent Neural Networks, and secondly, understanding and building an ML model for PdM.

This report aims to be an introductory guide for those interested in using ML for PdM. Required background information has been assembled to get a better picture. The report includes development of various ML models to find Remaining Useful Life (RUL) on the Water Pump Dataset. There has been information provided wherever necessary and code snippets are presented to assist the reader in understanding machine learning and to provide an approach to start building models.

PdM in itself is a technique for monitoring operating conditions to provide data that can ensure prediction in time-series datasets and reduce the number and ultimately the cost of machine failures. ML is gaining prominence as a tool for detecting patterns and making predictions from large amounts of data. Neural Networks (NN) are majorly used in achieving high accuracies for ML tasks.

Prerequisites : Dataset should consist of 10 rows testing data. Name the datasets as

Pumpset1 : test\_X\_dataset\_ret\_0.csv

Pumpset2 : test\_X\_dataset\_ret\_1.csv

Pumpset3 : test\_X\_dataset\_ret\_2.csv

Code Execution :

1. GUI - python3 demo\backend.py
   1. Localhost:5000
   2. Upload files present in demo/downloads and named as mentioned above
   3. Predict model
   4. Add and train new models
2. src – All the .ipynb files with the machine learning models
   1. Models have already been added with fine tuning to the GUI.
3. To create and run new models:
   * 1. run required files
     2. Save model
     3. Change model name in demo\<task>