

# AI on Predictive Maintenance

*Duration of the project* - 8 Months

*Final year mentor* - Anand Sriram

*Project Mentors* - Hari Chetan Kurapati, Prasanna PM

*Contact details* - 8310505651, 9620158122

*Team Members* - NA

## Introduction/abstract

*Aim/Problem statement* - Develop a deep learning model using a long short-term memory (LSTM) network, and create an autoencoder that detects anomalies for predictive maintenance

### *Inspiration*

There is a huge loss of money globally each year due to downtime from machine failure. Organizations across manufacturing, aerospace, energy and other industrial sectors are overhauling maintenance processes to minimize costs and improve efficiency. With artificial intelligence (AI) and machine learning, organizations can apply predictive maintenance to their operation, processing huge amounts of sensor data to detect equipment failure before it happens

*Present situation/Background info such as work done on this problem statement previously/already existing solution/already existing applications/Existing reports*

## Method

*A brief explanation of the methodology to be followed, the various techniques that will be employed, a flowchart of the entire approach/solution process. Mention any software/processors/sensors/hardware that will be used etc.*

1. Learn basics of python, pandas, ml, (optional web/app dev)
2. Implement a model that can detect already faulty machinery by checking for abnormalities
3. implement a model to predict the likelihood of failure in the near future. Try LSTMs vs autoencoders.
4. (Optional) Build a web application or an app that gives real-time performance and predictive maintenance alerts using our models

## Timeline

<b><i>Phases</i></b>	<b><i>Tasks</i></b>	<b><i>Start &amp; End dates</i></b>
Learning Phase	Learn basics of python, pandas, ml, (optional web/app dev)	<b><i>October- November</i></b>
Determining Faults	Implement a model that can detect already faulty machinery	<b><i>November-December</i></b>
Predicting faults	implement a model to predict the likelihood of failure in the near future. Try LSTMs vs autoencoders	<b><i>December- January</i></b>
Fine-tuning model	Try to improve the accuracy of the models, compare the pros and cons of LSTMs vs autoencoders	<b><i>January - February</i></b>
(optional) Web application	Build a web application or an app that gives real-time performance and predictive maintenance alerts using our models	<b><i>February</i></b>

## Expected results

*A brief explanation of the expected results/what you hope to find supported by results from previous work or existing background info.*

Make an LSTM model along with an autoencoder that detects anomalies for predictive maintenance and is able to estimate the condition of equipment and predict when maintenance should be performed. estimate the condition of equipment and predict when maintenance should be performed.

## Key takeaways/Learning outcomes for team participants

*This section mainly highlights your takeaway from the project. Include what one will learn in the process of solving the problem. (As a motivation for the first years)*

Learn to use Python, TensorFlow, Keras, LSTM, autoencoders, deep learning, and CNN

## References

*Mention all sources of information, including but not restricted to research papers, books, articles, and videos*

<https://drive.google.com/file/d/1mvDbgIkTmnoA1VSzsFq73hFhQEoOHihh/view?usp=sharing>

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