A

PROJECT REPORT

ON

FALSE DATA INJECTION ATTACKS

Submitted in partial fulfillment of the requirements

Submitted By

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Under the guidance

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ABSTRACT

Predictive maintenance techniques are designed to help determine the condition of in-service equipment to estimate when maintenance should be performed. This approach promises cost savings over routine or time-based preventive maintenance because tasks are performed only when warranted. Thus, it is regarded as condition-based maintenance carried out as suggested by estimations of the degradation state of an item.

TECHNOLOGY STACK

The technologies used in this application are:

- Python 3.10.0
- MATLAB
- Django

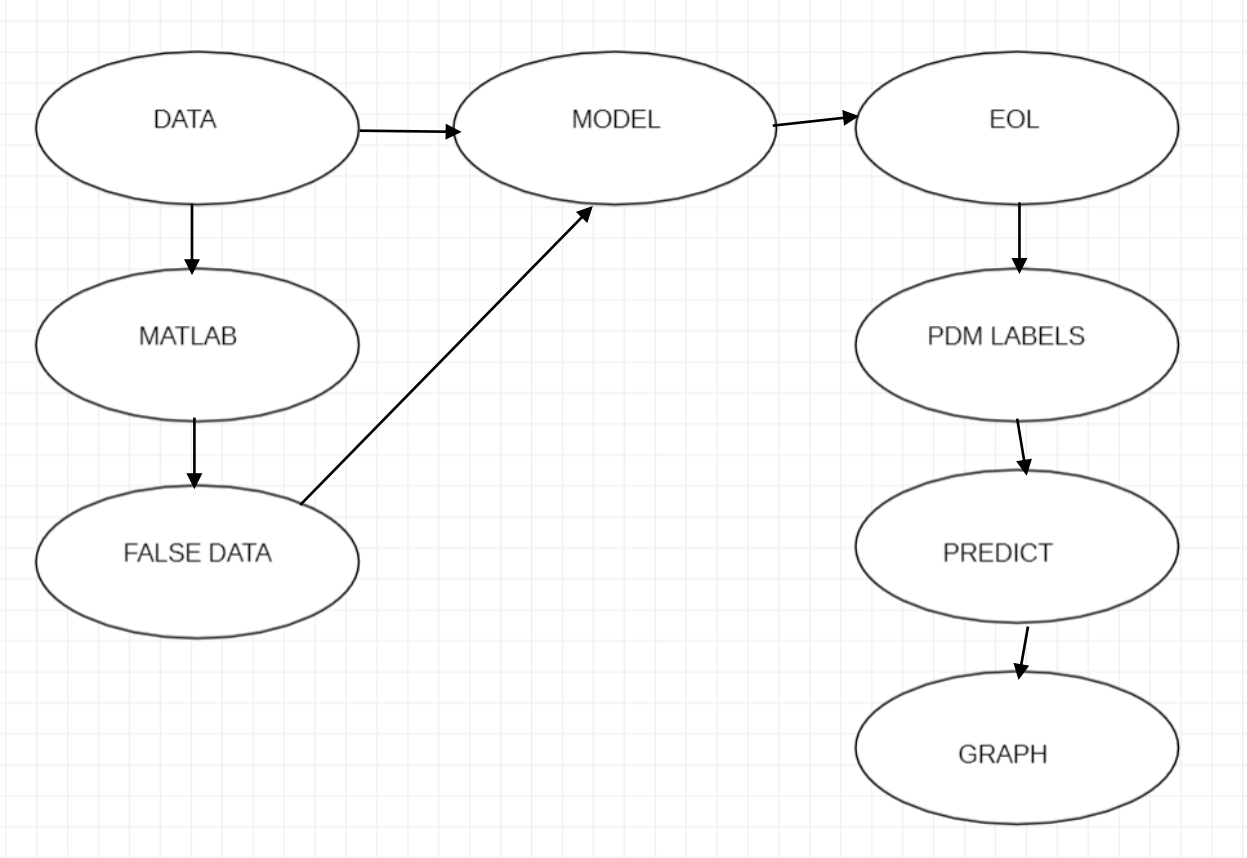
The modules used in this application are:

- Tensorflow
- scikit-learn
- matplotlib
- pandas
- Numpy
- Keras
- Seaborn

The algorithms used in this application are:

- kNN (k-Nearest Neighbours)
- Logistic Regression
- Random Forests
- Autoencoders

SYSTEM WORKFLOW



SCREENSHOTS

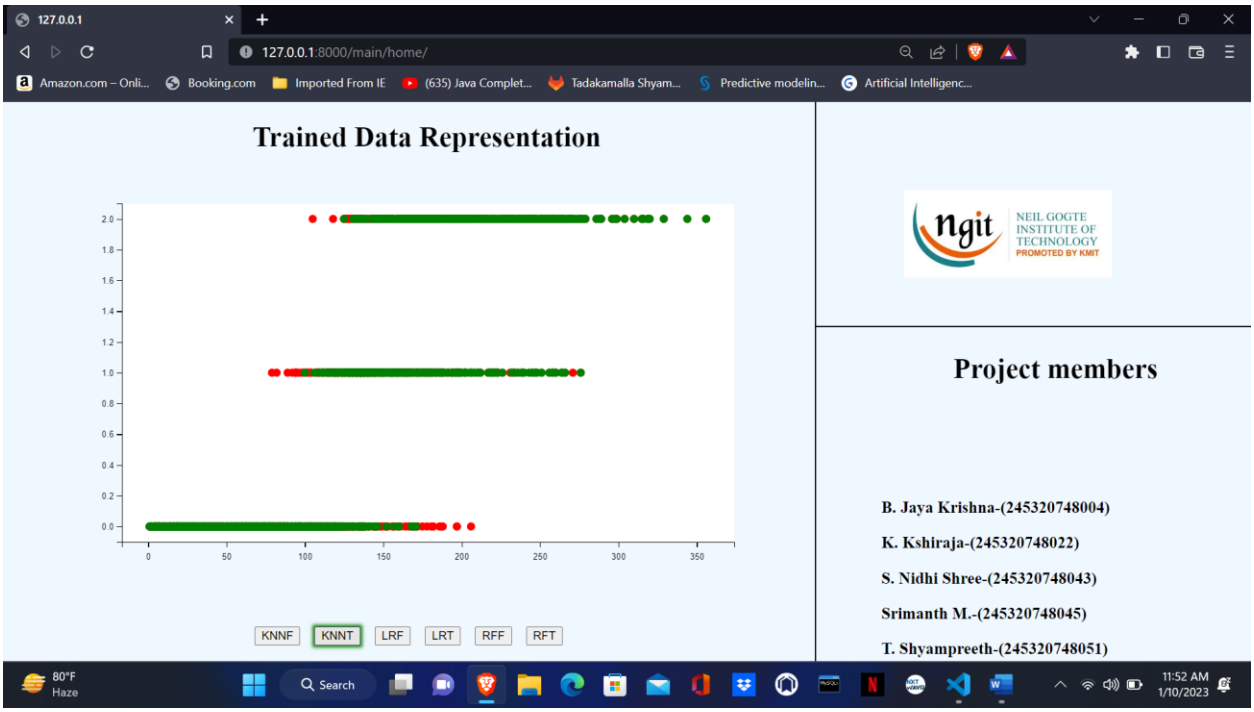


Figure 1: kNN without False Data Injection

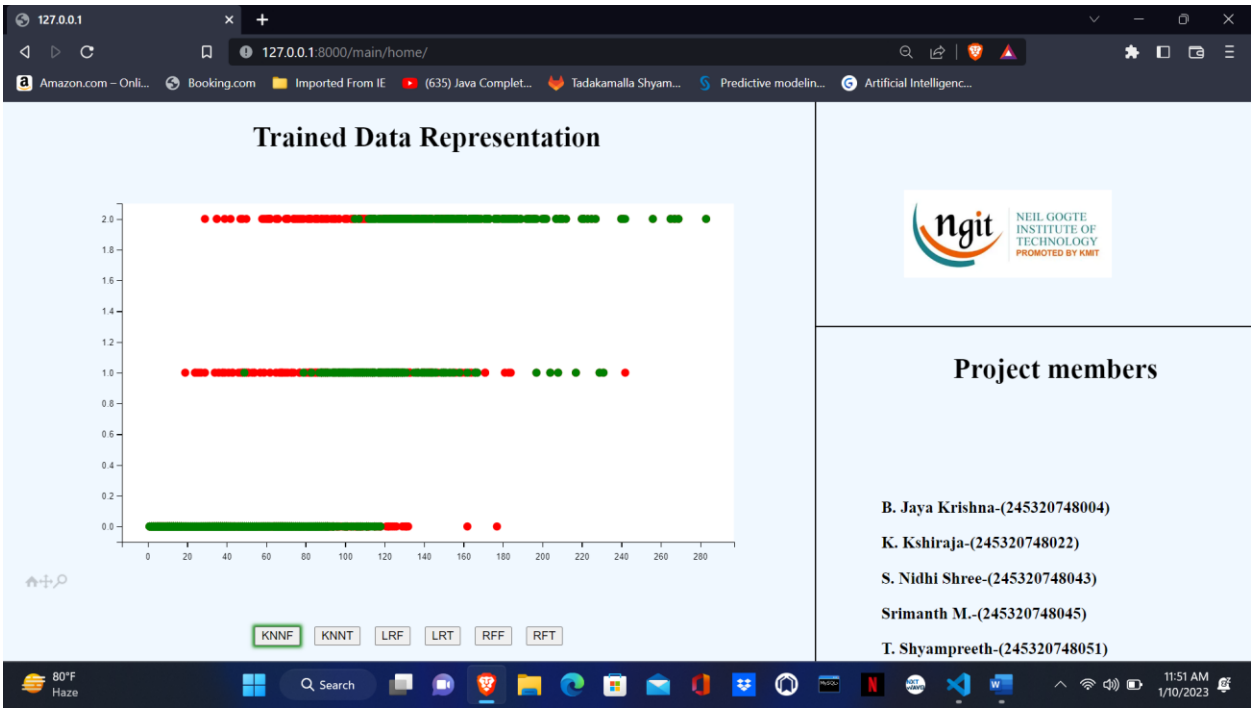


Figure 2: kNN after injection of False Data

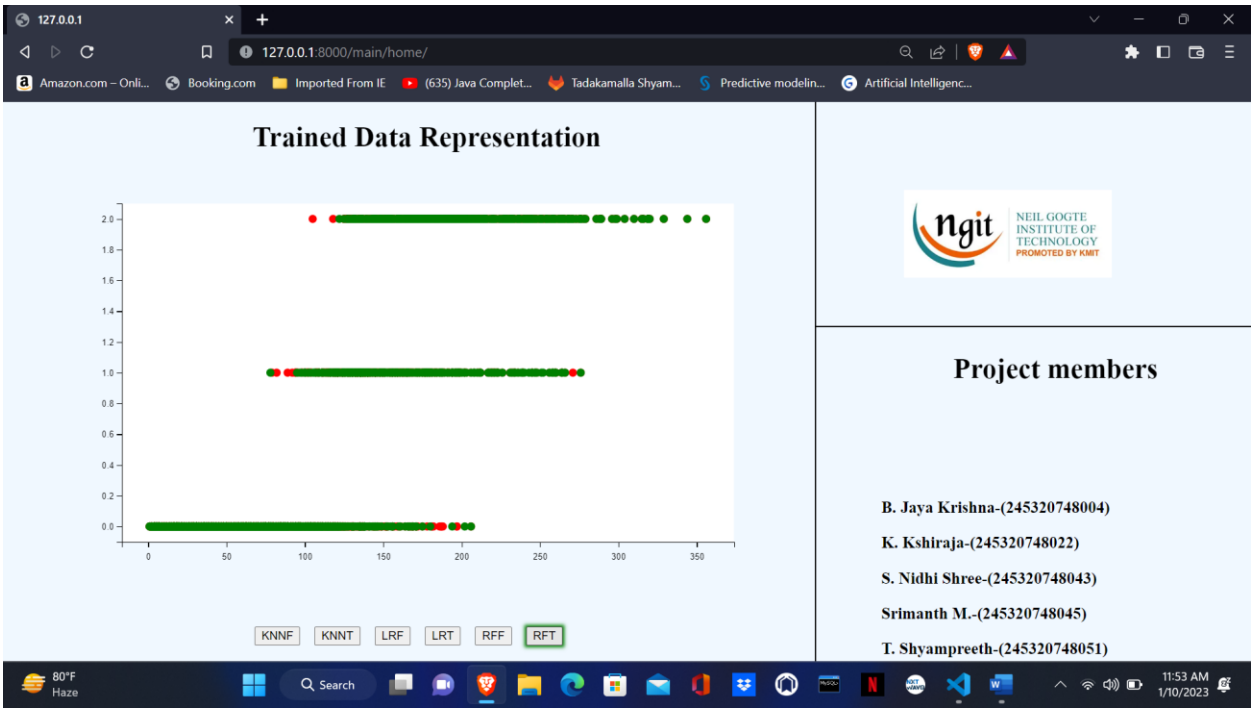


Figure 3: Random Forest without False Data Injection

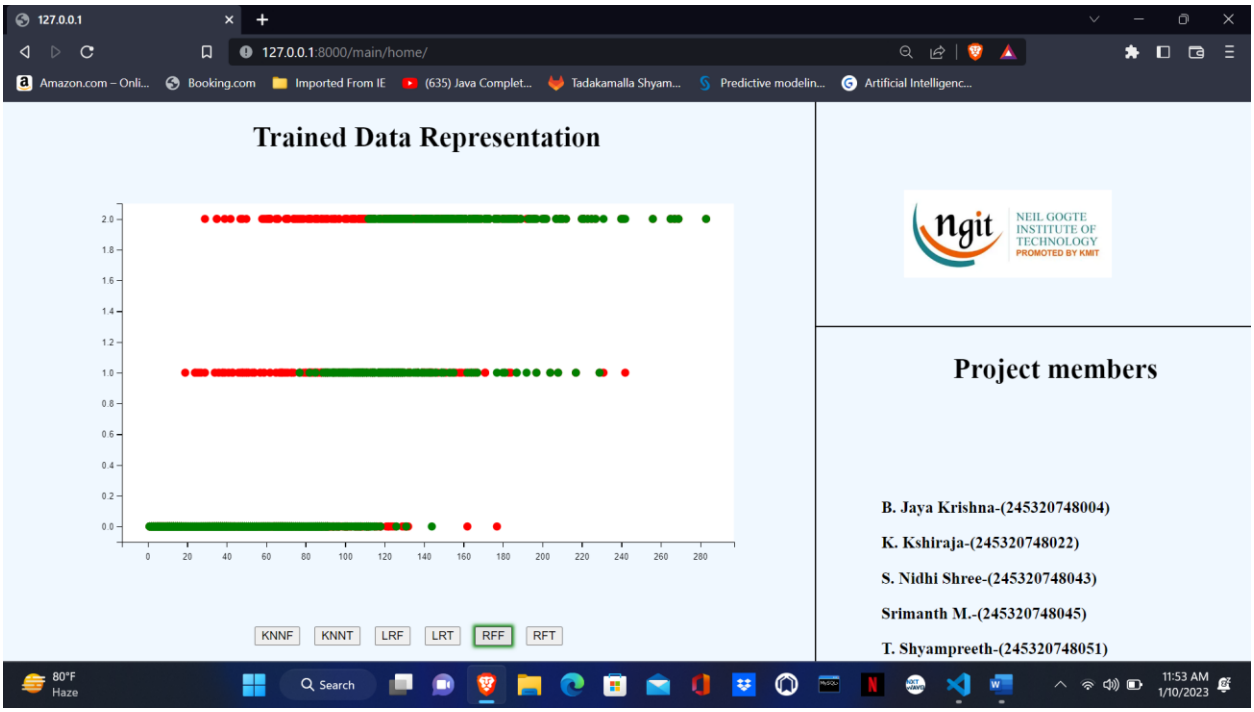


Figure 4: Random Forest after injection of False Data

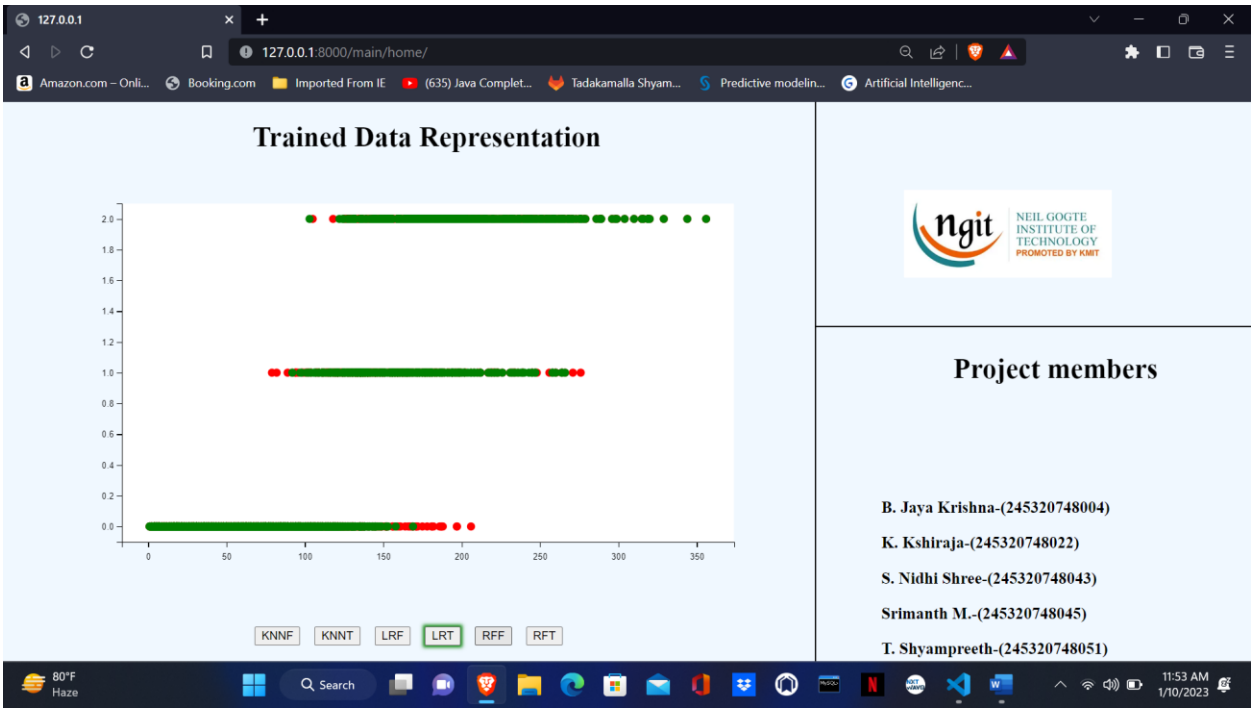


Figure 5: Logistic Regression without injection of False Data

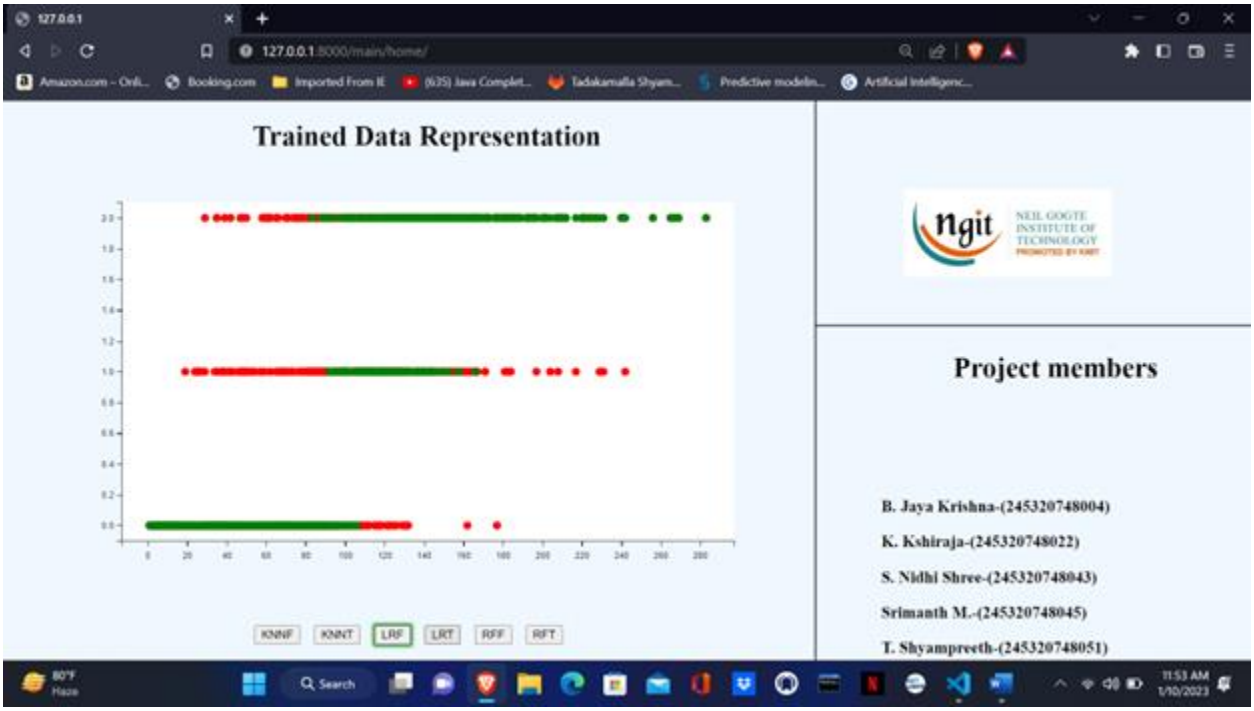


Figure 6: Logistic Regression after insertion of False Data

CONCLUSION AND FUTURE SCOPE

From this application, I learnt that for Machine Learning (ML) models, the model is not as important as the training data. Accuracy of the model is totally dependent on the purity of data.

This application is not yet completed, there is still room for improvement. For example, I can increase the number of algorithms. Also, this application is not real time so I can modify this application to intake data stream directly from the sensors themselves. Also, the number of features used in the current version is less so I can increase the number of features.

signature of the guide