Machine Learning

To detect the anomalies in Steam Turbine Vibration

Classification and Linear regression • linear regression contributes coefficients of each sensors in each load types

Load Type Classification

Type 2: 10 – 15 MW

Type 3: 15 – 20 MW

Type 4: 20– 25 MW

Type 5: 25 – 30 MW

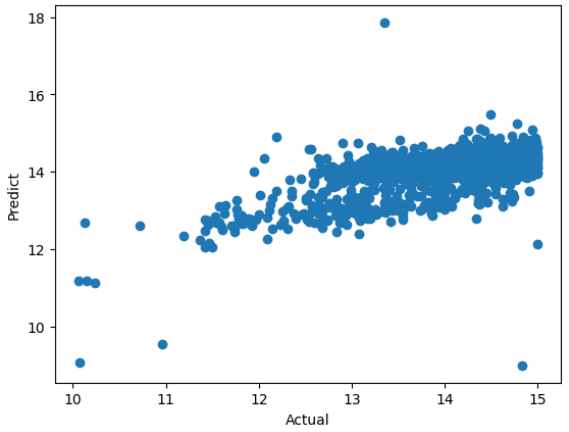
Type 6: 30 – 35 MW

Type 7:> 35 MW

Train set: Jan 2021 – Dec 2022

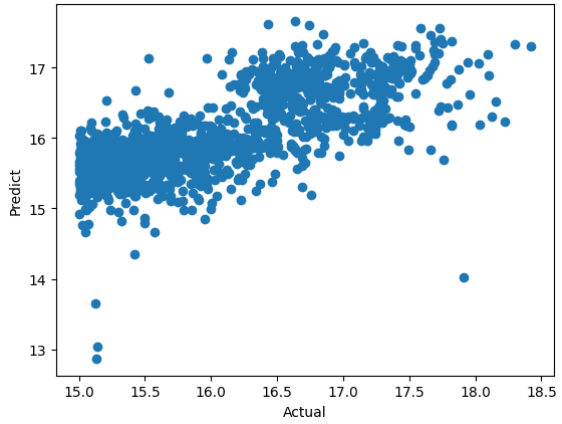
Test set: Jan 2023 – June 2023

Type 2



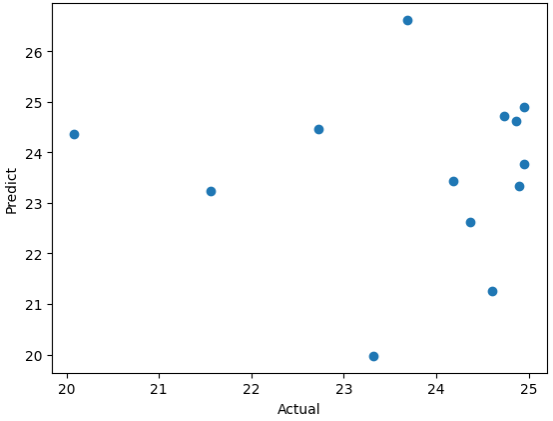
Accuracy = 0.3924

Type 3



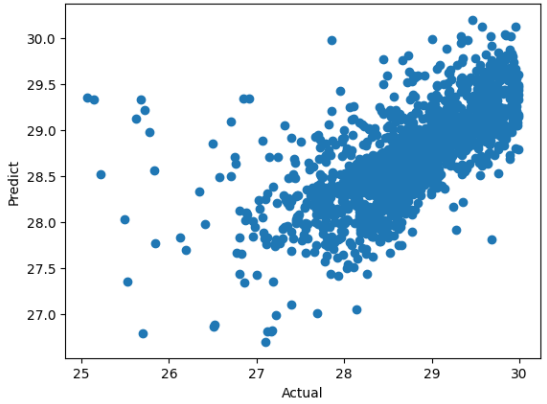
Accuracy = 0.5585

Type 4



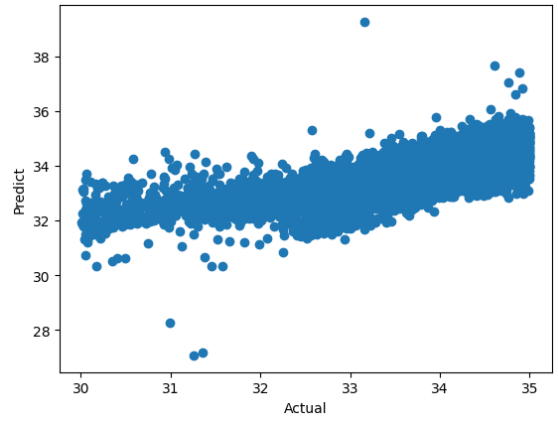
Accuracy = -1.3030

Type 5



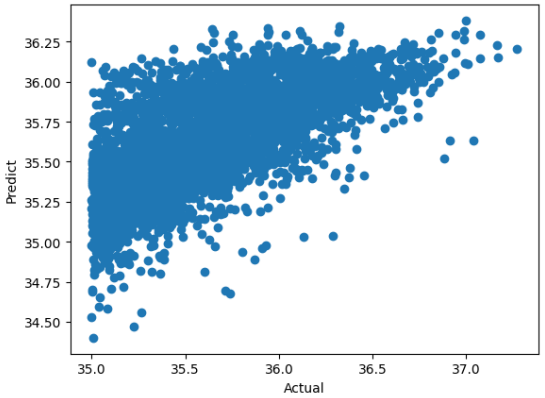
Accuracy = 0.4513

Type 6



Accuracy = 0.5534

Type 7



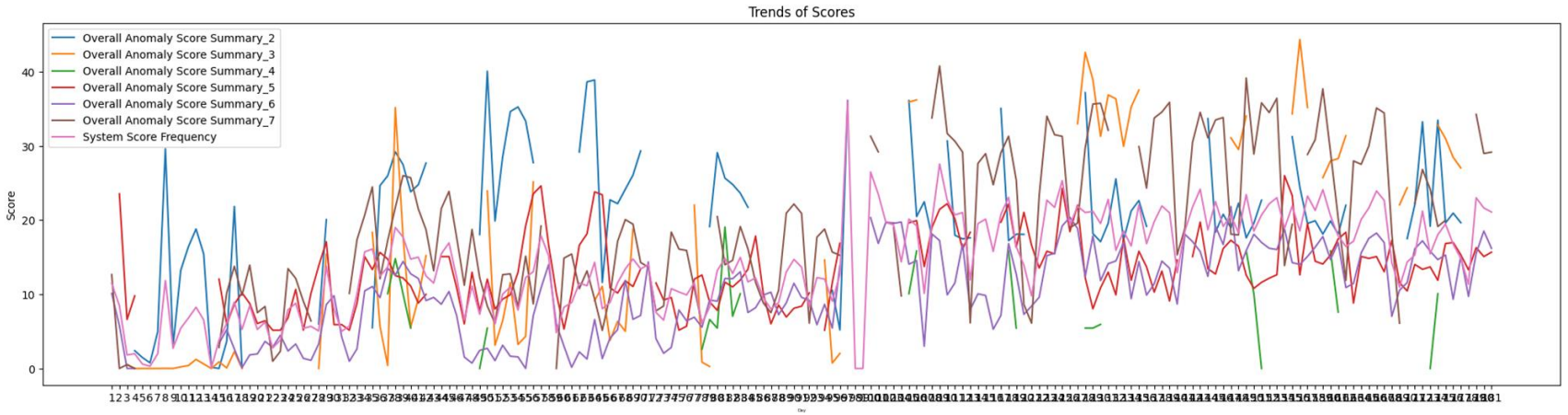
Accuracy = 0.4607

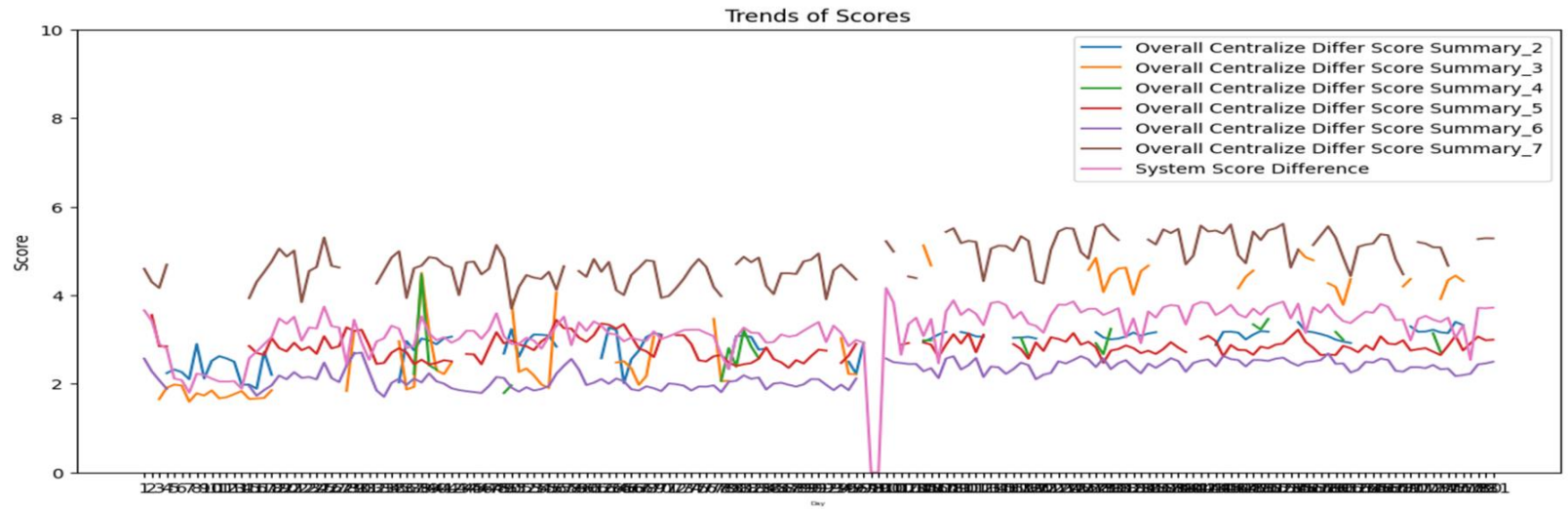
Helth Check: Anomaly Score and Centralize Differ Score

- calculate health score to check an outlier score of each sensors in equipment and anomalies

Train set: Jan 2021 – Dec 2022

Test set: Jan 2023 – June 2023





KNN Model

Load Type

Type 2: 10 – 15 MW

Type 3: 15 – 20 MW

Type 4: 20– 25 MW

Type 5: 25 – 30 MW

Type 6: 30 – 35 MW

Type 7:> 35 MW

Train set: Jan 2021 – Dec 2022

Test set: Jan 2023 – June 2023

			55%
LoadType	Count of Record_ID	Sum of Accuracy	% Accuracy
1	887	880	99%
2	10,199	5,521	54%
3	3,991	3,476	87%
5	1,830	499	27%
4	60	12	20%
6	28,980	13,704	47%
7	6,164	4,433	72%
Grand Total	52,111	28,525