

Weekly Research Project Status Report

Project Title : Stellar spectral classification using Active learning approach

Report Date : 5th April, 2025

Summary of Progress

1. We implemented Vote based Ensemble Learning on our data after applying SMOTE. In this we use the following models:

'knn': K-Nearest Neighbors

'rf': Random Forest

'gb': Histogram-based Gradient Boosting

'vote': Voting Classifier

2. The metrics that are used for evaluation are-

'auc': Area Under the Curve

'mcc': Matthews Correlation Coefficient

'sen': Sensitivity (Recall)

'spec': Specificity

| model | auc | mcc | sen | spec |
|-------|----------|----------|----------|----------|
| knn | 0.912194 | 0.589784 | 0.761650 | 0.932479 |
| rf | 0.957220 | 0.678375 | 0.782487 | 0.945484 |
| gb | 0.937244 | 0.570645 | 0.709259 | 0.929601 |
| vote | 0.957953 | 0.650149 | 0.775289 | 0.941467 |

Planned Activities for Next Week

- Try to implement the Active Learning approach
- .

