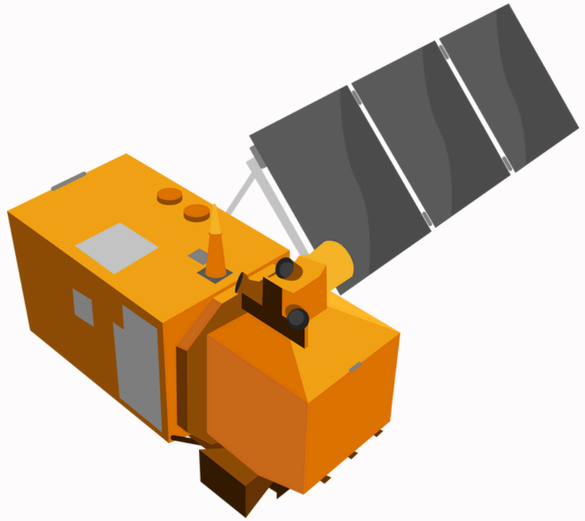
Presentation

FOREST CLASSIFICATION

401313-ฐิรพรรษ-Kiddee

PROBLEM STATEMENT

Forest Type Classification



Sentinel-2

ป่าเบญจพรรณ - MDF

ป่าเต็งรัง - DDF

ป่าดิบแล้ง - DEF

Dataset

Training Set

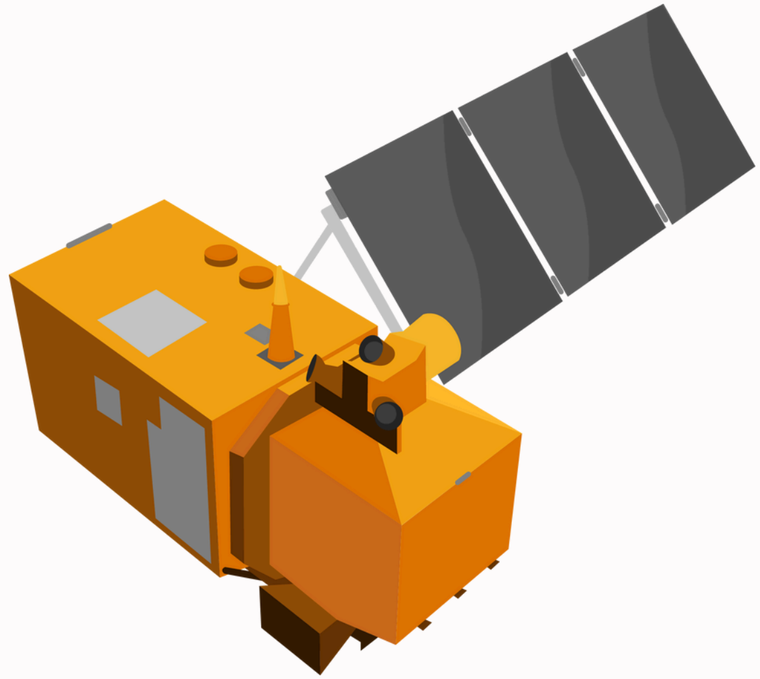
13053 rows × 14 columns

Test Set

4000 rows × 14 columns

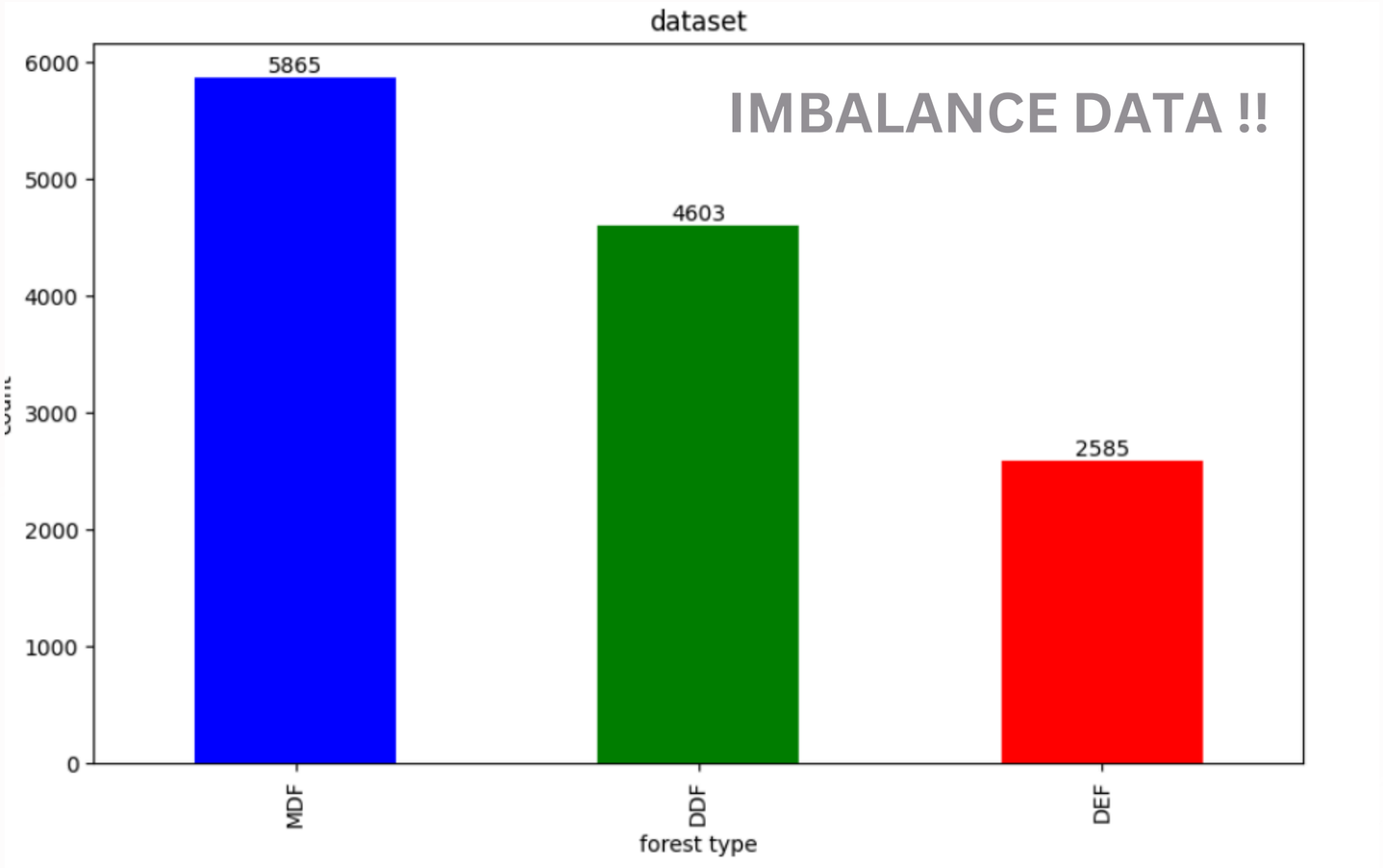
SENTINEL-2 BANDS

Feature	Central Wavelength	Resolution
Band 1 - Coastal aerosal	443nm	60m/px
Band 2 - Blue	490nm	10m/px
Band 3 - Green	560nm	10m/px
Band 4 - Red	665nm	10m/px
Band 5 - Vegetation red edge	705nm	20m/px
Band 6 - Vegetation red edge	740nm	20m/px
Band 7 - Vegetation red edge	783nm	20m/px
Band 8 - NIR	842nm	10m/px
Band 8A - Vegetation red edge	865nm	20m/px
Band 9 - Water Vapour	945nm	60m/px
Band 11 -SWIR	1610nm	20m/px
Band 12 - SWIR	2190nm	20m/px



Sentinel-2

DATA EXPLORATION



Feature Engineering

- NDWI - Normalized Difference Water Index
- NDSI - Normalized Difference Snow Index
- BSI - Bare Soil Index
- NBR1 - Normalized Burn Ratio 1
- NBR3 - Normalized Burn Ratio 3
- NBR4 - Normalized Burn Ratio 4
- AFRI1 - Atmospherically Resistant Vegetation Index 1
- AFRI2 - Atmospherically Resistant Vegetation Index 2
- AFRI3 - Atmospherically Resistant Vegetation Index 3
- AFRI4 - Atmospherically Resistant Vegetation Index 4
- BNDVI1 - Blue Normalized Difference Vegetation Index 1
- BNDVI2 - Blue Normalized Difference Vegetation Index 2
- BWDRVI1 - Blue Wide Dynamic Range Vegetation Index 1
- BWDRVI2 - Blue Wide Dynamic Range Vegetation Index 2
- NDVI1 - Normalized Difference Vegetation Index 1

Feature Engineering

- NDVI2 - Normalized Difference Vegetation Index 2
- WDRVI1 - Wide Dynamic Range Vegetation Index 1
- WDRVI2 - Wide Dynamic Range Vegetation Index 2
- SAVI1 - Soil Adjusted Vegetation Index 1
- SAVI2 - Soil Adjusted Vegetation Index 2
- GNDVI1 - Green Normalized Difference Vegetation Index 1
- GNDVI2 - Green Normalized Difference Vegetation Index 2
- NDRE1 - Normalized Difference Red Edge 1
- NDRE2 - Normalized Difference Red Edge 2
- NDRE3 - Normalized Difference Red Edge 3
- NDRE4 - Normalized Difference Red Edge 4
- NDRE5 - Normalized Difference Red Edge 5
- NDRE6 - Normalized Difference Red Edge 6
- VIgreen - Vegetation Index Green
- CIgreen1 - Chlorophyll Index Green 1

Feature Engineering

- CIgreen2 - Chlorophyll Index Green 2
- CIrededge1 - Chlorophyll Index Red Edge 1
- CIrededge2 - Chlorophyll Index Red Edge 2
- CIrededge3 - Chlorophyll Index Red Edge 3
- CIrededge4 - Chlorophyll Index Red Edge 4
- CIrededge5 - Chlorophyll Index Red Edge 5
- CIrededge6 - Chlorophyll Index Red Edge 6
- CI - Canopy Index
- CVI1 - Chlorophyll Vegetation Index 1
- CVI2 - Chlorophyll Vegetation Index 2
- CCCI1 - Canopy Chlorophyll Content Index 1
- CCCI2 - Canopy Chlorophyll Content Index 2
- CCCI3 - Canopy Chlorophyll Content Index 3
- CCCI4 - Canopy Chlorophyll Content Index 4
- CCCI5 - Canopy Chlorophyll Content Index 5

Feature Engineering

- CCCI6 - Canopy Chlorophyll Content Index 6
- EVI1 - Enhanced Vegetation Index 1
- EVI2 - Enhanced Vegetation Index 2
- GARI1 - Green Atmospherically Resistant Index 1
- GARI2 - Green Atmospherically Resistant Index 2
- GLI - Green Leaf Index
- GBNDVI1 - Green-Blue Normalized Difference Vegetation Index 1
- GRNDVI1 - Green-Red Normalized Difference Vegetation Index 1
- GRNDVI2 - Green-Red Normalized Difference Vegetation Index 2
- SLAVI1 - Soil and Landscape Adjusted Vegetation Index 1
- SLAVI2 - Soil and Landscape Adjusted Vegetation Index 2
- SLAVI3 - Soil and Landscape Adjusted Vegetation Index 3
- SLAVI4 - Soil and Landscape Adjusted Vegetation Index 4

MODEL

4 Neural Network

3 SVM

2 Random Forest

1 XGBoost

EXPERIMENT

XGBoost + Optuna + Cross validation + Feature

Random Forest + Feature

SVM + Optuna+ Feature

Final Neural Network ✓

Submission

submission-random.csv Complete · 8d ago	0.67305	0.64852	☐
test-SVM.csv Complete · 7d ago	0.68338	0.66225	☐
feature(an)-hyperparameters-cv-2.csv Complete · 8d ago	0.70796	0.67599	☐
MLPs-Feat-400.csv Complete · 6d ago	0.69911	0.68921	☐
MLPs-NoFeat-1000.csv Complete · 6d ago	0.70206	0.69430	☑
MLPs-NoFeat-200.csv Complete · 6d ago	0.70698	0.68718	☐

Future Plan

- Make feature engineering more efficient
- Optimize Neural Network
- Ensemble Learning

THANK YOU