NASA Turbofan Engine RUL Prediction

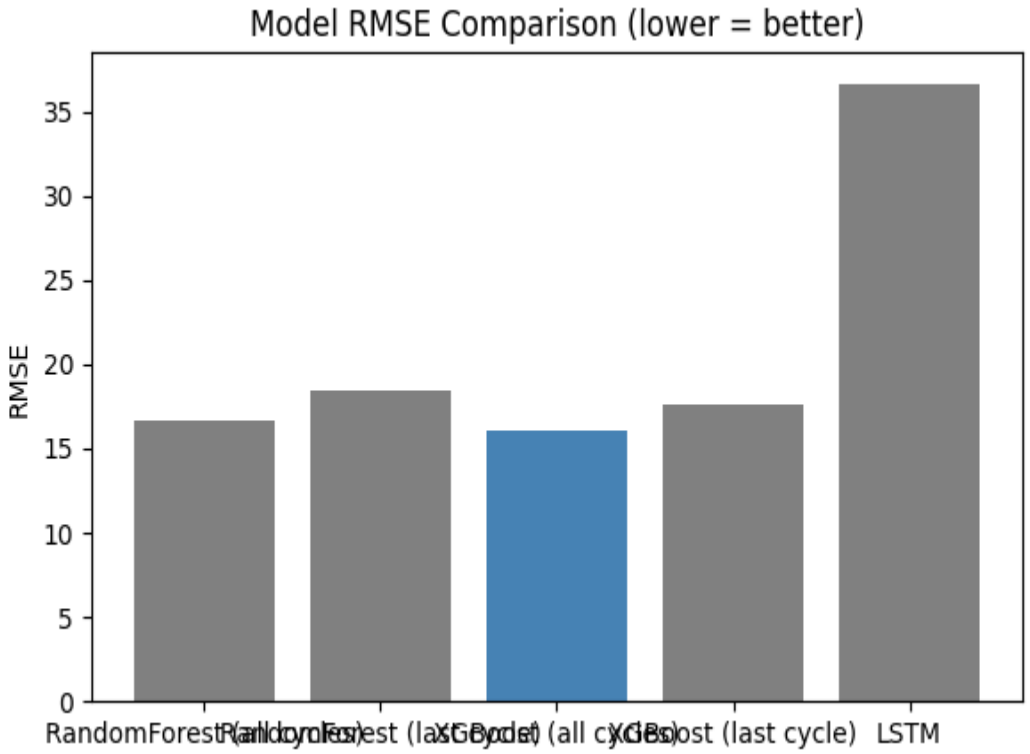
Project Summary:

This project predicts the Remaining Useful Life (RUL) of aircraft engines using NASA's CMAPSS dataset (FD001). Three models were compared: Random Forest, XGBoost, and an LSTM sequence model. Data preprocessing included rolling/lag feature engineering and RUL labeling.

Model Performance Summary:

Model	MAE	RMSE
RandomForest (all cycles)	11.974	16.643
RandomForest (last cycle)	13.061	18.405
XGBoost (all cycles)	11.63	16.014
XGBoost (last cycle)	12.631	17.565
LSTM	29.677	36.632

RMSE Comparison Chart:



The LSTM model captures temporal degradation trends, while tree-based models provide strong baselines. Future work could include multi-sensor attention models or multi-fleet domain adaptation.