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Project Proposal: Predicting Remaining Useful Life (RUL) of Turbofan Engines
Dataset: NASA Turbofan Engine Degradation Simulation Dataset

1. Dataset Overview:

- **Description**: The dataset consists of multivariate time series data collected from a fleet of turbofan engines. Each engine begins its operation with varying levels of wear and develops faults over time. The training set illustrates the degradation process until failure, while the test set contains data that ends before failure. The objective is to predict the Remaining Useful Life (RUL) of the engines in the test set.
- **Justification**: RUL prediction is a critical aspect of maintenance strategies in aerospace engineering, as it aids in optimizing maintenance schedules and enhancing safety by preventing unexpected engine failures.

2. Methodology:

- **Data Preprocessing**:
  - **Noise Reduction**: Implement techniques to filter and smooth noisy sensor data.
  - **Feature Engineering**: Generate additional features (e.g., moving averages, differences) to enhance model performance.
  - **Normalization**: Standardize sensor data to ensure comparability.
- **Model Selection**:
  - **Random Forest Regression**: To provide robust and interpretable predictions.
  - **Long Short-Term Memory (LSTM)**: To capture the sequential dependencies in the time series data.
  - **Gradient Boosting/XGBoost**: As alternative models for performance benchmarking.
- **Evaluation Metrics**:
  - Utilize Mean Squared Error (MSE) and Root Mean Squared Error (RMSE) to assess model accuracy.

3. Application:

- **User Interface**: Develop a web application that allows users to upload engine sensor data in CSV format for RUL predictions.
- **User Experience**:
  - Users can upload their data files.
  - The application will output the predicted Remaining Useful Life (RUL)