WEATHER FORECASTING USING ML

Enrollment no:

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INTRODUCTION

Weather forecasting is critical in various sectors such as agriculture, transportation, and disaster management.
Traditional forecasting methods rely on numerical models and historical data but may lack accuracy, especially for short-term predictions.
This project aims to leverage machine learning techniques to enhance the accuracy and reliability of weather forecasting.

OVERVIEW

By analyzing historical weather data and incorporating advanced algorithms, we intend to develop models capable of predicting various meteorological parameters with higher precision.

Preprocessing the collected data involves cleaning, normalization, and feature engineering to ensure its suitability for machine learning algorithms.

PROBLEM STATEMENT

Weather forecasting is crucial for various industries and societal activities, ranging from agriculture to aviation. Despite advancements in technology and numerical modeling, traditional forecasting methods often struggle with accuracy, especially in predicting short-term weather patterns. The problem statement revolves around the need to develop a reliable and precise weather forecasting system using machine learning techniques.

OBJECTIVES

Collect comprehensive weather data from various sources including meteorological stations, satellites, and sensors.
Preprocess the data by cleaning outliers, handling missing values, and normalizing features to ensure consistency and quality.
Engineer relevant features such as temperature trends, humidity patterns, wind direction, and atmospheric pressure variations.
Experiment with different machine learning algorithms such as regression, decision trees, random forests, and neural networks to identify the most suitable models.

MODELS USED

We have used Random Forest Classifier which gave highest accuracy among all the models.
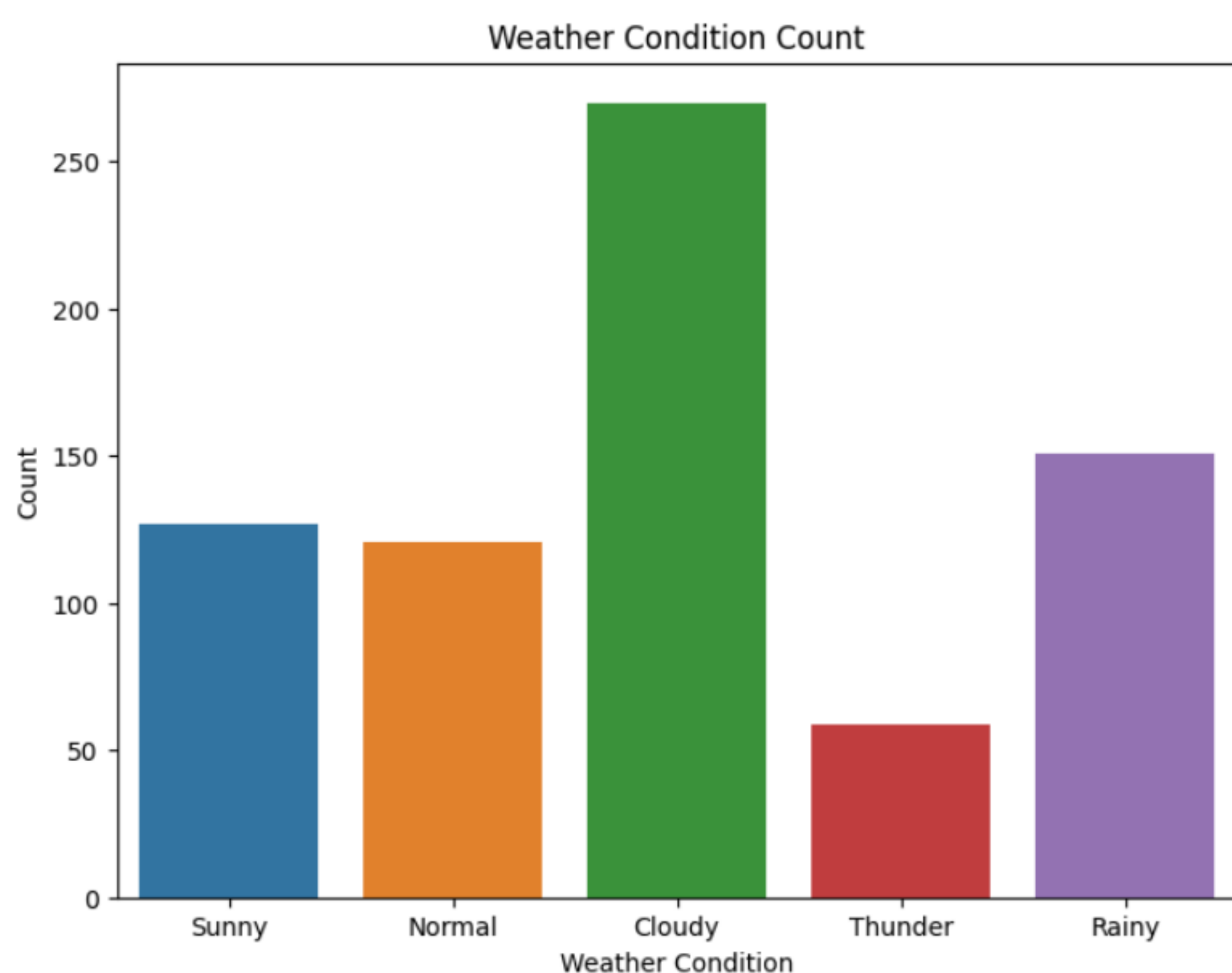
LIMITATIONS

In short-term forecasts tend to be relatively accurate, the accuracy decreases as the forecast horizon extends further into the future. Long-term climate projections, while valuable for understanding trends, are subject to greater uncertainty than short-term weather forecasts.
The atmosphere is a complex system where multiple variables interact with each other in nonlinear ways.
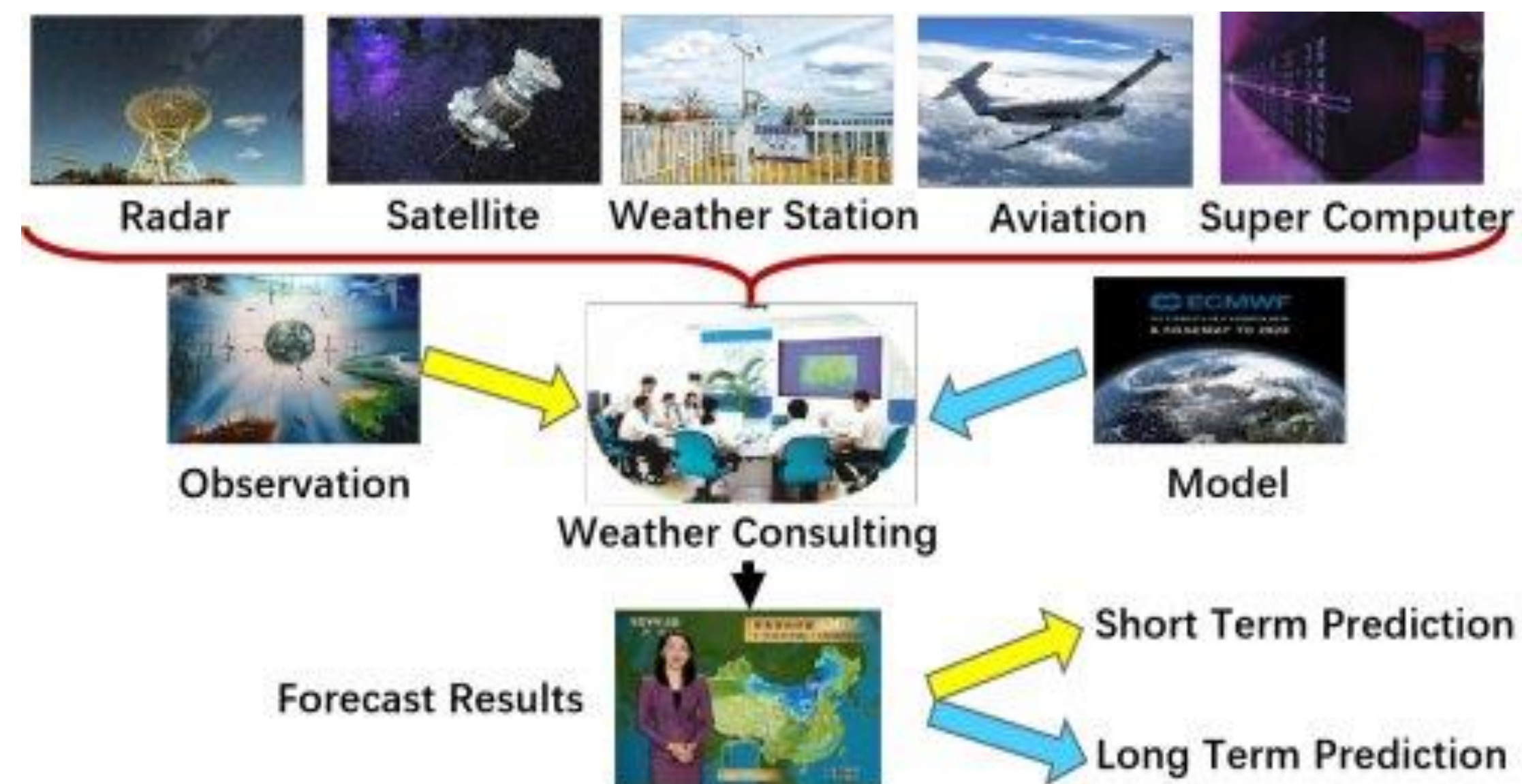
PROPOSED METHODOLOGY

The proposed system aims to develop a robust and accurate weather forecasting platform leveraging machine learning techniques. This system will integrate advanced algorithms with comprehensive data processing methods to enhance forecast accuracy and reliability, particularly for short-term predictions and localized weather events.

REFERENCES

https://www.researchgate.net/publication/360365118_Smart_Weather_Prediction_Using_Machine_Learning

https://ieeexplore.ieee.org/document/8938211

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Dr.M.Sheshikala, HOD, CS&AI Dept.

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