# WEATHER FORECAST-USING MACHINE LEARNING

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## ABSTRACT

This paper gives a quick summary of numerical weather forecast trends, challenges, and the nature of their occurrence, as well as existing and possible solutions. This design enables for the prediction of atmospheric model forecast mistakes as well as their subsequent solutions. The initial attempt to mathematically predict weather necessitated a large crew. The meteorological data at a certain station is examined for a short radius across a specific region. The results suggest that it can more precisely and flawlessly forecast weather conditions. Physical models of the atmosphere have traditionally been used to forecast weather, but they are unstable to perturbations and consequently inaccurate over long periods of time. The scope of this paper was limited to predicting the highest and lowest temperatures for the next seven days using weather data from the previous two days. Improved and dependable weather forecast technologies are necessary to solve these challenges. The main goal of this project is to create a weather forecasting system that can be used in isolated areas.

**Keywords:** sensors, temperature, model, cloudy

## 1. INTRODUCTION

The objective of weather forecasting is to anticipate the state of the atmosphere at a specific time and location in the future. This paper shows how to predict rain using real-time temperature, humidity, and pressure data from multiple sensors. The development and operational application of numerical hydrodynamic methods for weather forecasting have surely evolved over the last 30 years. It was made feasible by the development of powerful computer systems, the development of increasingly sophisticated and practical mathematical models, and the necessary expansion of the baseline meteorological data set By numerically solving the equations of fluid dynamics and thermodynamics, the current state of the atmosphere is canvased, and the future state is determined. However, the system of ordinary differential equations that governs this physical model is unstable under fluctuation, and uncertainties in initial atmospheric measurements, as well as an incomplete ability to adapt to new atmospheric processes, limit the accuracy of weather forecasting to a 10-day period, after which forecasts become significantly unreliable.

The goal of this project is to develop a scientific model for predicting climate change. It would consider parameters such as the lowest temperature, the highest temperature, wetness, and the average temperature. It aids in the monitoring of storms, floods, precipitation, snowfall, and other natural disasters. As part of our project, we are primarily attempting to predict precipitation using a scientific model as part of the data mining systems and methods.

The rest of the paper is organized as follows: Section II explains the literature survey . Section III presents the proposed system. Section IV explains the details of implementation of this work.

The first technique utilised was linear regression, which attempts to forecast high and low temperatures by combining features in a linear fashion. This technique did not use the weather classification of each day because linear regression cannot be applied with classification data. As a result, just eight variables were considered: maximum temperature, minimum temperature, mean humidity, and mean atmospheric pressure during the previous two days. Many varied and fascinating ways to try to perform weather forecasts were incorporated in related studies.

**Figure 1:** scattered clouds and partly cloudy

## 2. DATASET AND FEATURES

Weather Underground provided the maximum temperature, minimum temperature, mean humidity, mean atmospheric pressure, and weather classification for each day in the years 2011-2015 for Stanoford, CA. Clear, scattered clouds, partly cloudy, generally cloudy, fog, overcast, rain, thunderstorm, and snow were the original nine weather classifications. Because many of these classifications are similar and some are sparsely populated, they were combined into four weather classifications: scattered clouds and partly cloudy became moderately cloudy; mostly cloudy, foggy, and overcast became very cloudy; and rain, thunderstorms, and snow became precipitation. The first four years of data were utilised to train the algorithms, while the latest year's data served as a test set.

Temperature, humidity, pressure, precipitation, and other elements are examined and a dataset is formed based on the meteorological conditions at our location. These numbers are based on the weather conditions in our city, Guntur, Andhra Pradesh, while the remainder of the dataset variables are obtained from historical data based on the city's climatic conditions. Around one thousand values are included in the dataset, which was developed so that there are few correlations between the attributes and framed values based on temperature and humidity swings.

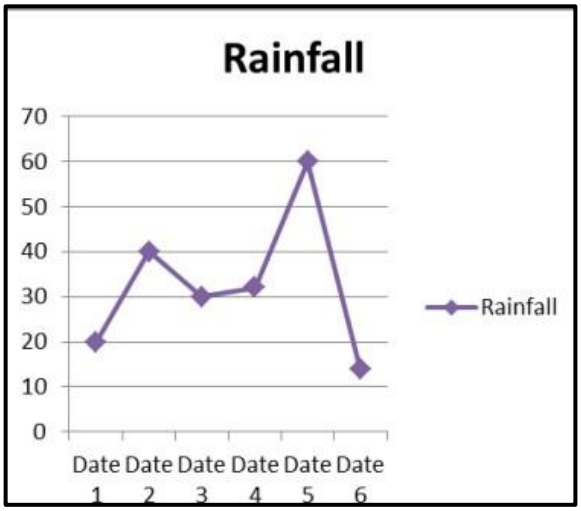


**Figure 2:** Rainfall Data

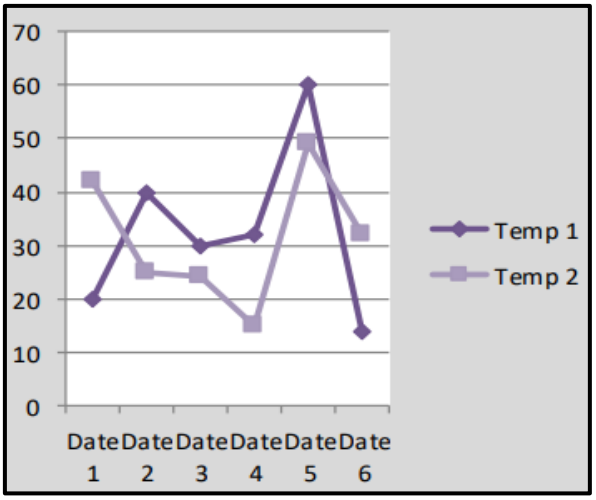


Figure 3: Graph Temperature

## 3. PROPOSED SYSTEM

The network architecture aids in a deeper understanding of the various steps. It aids in the effective design of the system as well as the comprehension of the system's nature.

## 4. SYSTEM IMPLEMENTION

The date is gathered as an input from the user, kept as an input, and a prediction for that specific date is displayed as part of the system integration process. The user can choose the statistics plot that they wish to look at. Following that, inputs such as the 'from' and 'to' dates must be entered. A graphical depiction of the stats is displayed after entering the inputs.

The data is fetched and stored by the programme using an XML table. It has something to do with the programme. The data tables can be imported from spreadsheets or CSV files using this method. This fusion table can be used by developers to insert, amend, and delete data. The data can be quickly displayed on a map or as a chart. Filter visualisations to make them more selective.

The user interaction module, connectivity module, weather statistics module, rainfall statistics module, and a rainfall forecast module are among the modules offered. Users' requests are taken into account, and changes to the application are made. The modifications are saved in the database and are updated for future details and predictions.

## 5. CONCLUSION

The project's goal is to use a mathematical model to anticipate weather forecasting. The early concept for statistically predicting weather necessitated a larger workforce.

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