

Weather Forecasting through IoT and ML

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Abstract: *Weather forecasting plays a crucial role in various sectors such as transportation, aviation, and daily life activities. However, traditional weather forecasting systems often lack real-time localized data and accuracy. To overcome these limitations, this paper proposes a **Weather Forecasting System using Internet of Things (IoT) and Machine Learning (ML)** technologies. In this system, IoT-based sensors are deployed to continuously monitor environmental parameters such as temperature and humidity. The collected real-time data is transmitted to a cloud server, where it is processed and analyzed using Machine Learning algorithms to generate accurate weather predictions. Machine Learning models such as Random Forest, Support Vector Machine (SVM), and Long Short-Term Memory (LSTM) are trained using historical weather datasets to predict short-term and long-term weather conditions. These models improve forecasting accuracy by identifying hidden patterns and trends in the data. The system also includes a user-friendly web or mobile interface that provides real-time updates, weather alerts, and future predictions. This helps users make informed decisions in advance. The integration of IoT and ML enhances forecasting efficiency, reduces prediction errors, and enables real-time monitoring. Overall, the proposed system serves as an intelligent and cost-effective solution for modern weather forecasting, contributing to improved accuracy, accessibility, and reliability of weather information..*

Keywords: IoT in Weather Forecasting, Artificial Intelligence (AI), Machine Learning (ML), Climate Prediction, Smart Farming

