Real Time Wheather Monitoring

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ABSTRACT—

Real-time weather monitoring plays a crucial role in agriculture, disaster management, smart cities, and climate analysis. This paper presents a real-time weather monitoring system based on Internet of Things (IoT) sensors integrated with Artificial Intelligence (AI) for data analysis and prediction. Sensors collect parameters such as temperature, humidity, pressure, and rainfall, which are transmitted to a cloud platform for real-time visualization and storage. AI models are applied to detect patterns and provide short-term weather predictions, making the system more accurate and intelligent. The proposed system is cost-effective, scalable, and suitable for real-world deployment.

Keywords—Real-time weather monitoring, IoT, sensors, artificial intelligence, cloud computing.

I. INTRODUCTION

Weather monitoring is essential for understanding environmental conditions and making informed decisions.

Traditional weather stations are expensive and limited in coverage. With the rapid growth of IoT and AI technologies, low-cost sensors and intelligent data analysis techniques can be used to build efficient

II. SYSTEM ARCHITECTURE

The proposed system consists of environmental sensors, a microcontroller, cloud server, and AI-based analytics module. Sensors continuously measure weather parameters and send data to the cloud through wireless communication. The cloud platform stores and visualizes the data in real time.

III. ROLE OF AI IN WEATHER MONITORING

Artificial Intelligence enhances the system by analyzing historical and real-time data to identify trends and predict short-term weather changes. Machine learning algorithms improve accuracy over time, making the system adaptive and intelligent.

IV. APPLICATIONS

The system can be used in agriculture for crop planning, in disaster management for early warnings, in smart cities for environmental monitoring, and in educational institutions for research purposes .

V. CONCLUSION

This paper presents an IoT and AI-based real-time weather monitoring system that is reliable, scalable, and cost-effective. The integration of AI adds human-like intelligence to the system, enabling better decision-making and future weather prediction.