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IoT-Based Smart Weather Station Using ESP32 for Real-Time Environmental Monitoring

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Abstract: *This research paper proposes development of IoT based Smart Wheater station leveraging ESP-32-WROOM-32 devkit. The system integrates with multiple sensor modules that collect real-time data for Wheater monitoring. The sensors deployed are DHT22 for temperature and humidity measurement, BMP180 for barometric pressure, MQ135 for air quality, LDR for luminous intensity. The graphical user interface was created through which the forecasted data was visualized using gauges, line charts and heatmaps. Interface comes with on/off feature through which user can access the system remotely. The proposed system comes with an accurate tracking, cost effective yet scalable solution to the real-world application such as smart agriculture, pollution detection, Wheater monitoring. The research also highlighted the versatility, reliability and efficiency of ESP-32-WROOM-32 in IoT applications. Future upgradation of the system may include integration with additional sensors, cloud base data storage and AIML predictive analytics for further advancements of the system.*

Keywords: Smart Wheater

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