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(57) Abstract :
 This invention presents an innovative intelligent system designed for graphing and deciphering clustering outcomes in IoT-generated weather data. As IoT technology proliferates, vast amounts of real-time weather data are collected, presenting opportunities and challenges in data analysis. The proposed system employs advanced unsupervised learning techniques, including K-Means, DBSCAN, and Hierarchical Clustering, to automatically identify and group similar weather patterns without predefined labels. By leveraging these clustering algorithms, the system reveals hidden trends and anomalies in the weather data, facilitating deeper insights into complex weather dynamics. An intelligent visualization module generates interactive and dynamic visualizations—such as scatter plots, heatmaps, and time-series graphs—allowing users to intuitively interpret clustering results. Moreover, the system offers automated interpretations of clusters, highlighting significant weather phenomena and flagging anomalies for user attention. By providing real-time processing capabilities and user-friendly interfaces, the system enhances accessibility to sophisticated weather data analytics, making it valuable for various sectors including agriculture, disaster management, and environmental monitoring. Ultimately, this system represents a significant advancement in weather data analysis, enabling proactive decision-making based on comprehensive insights into evolving weather patterns.

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