ABSTRACT

Weather plays a crucial role in many aspects of daily human activities. Sudden weather changes can impact sectors such as transportation, agriculture, and disaster management. Therefore, an automatic and accurate weather classification system is needed. One effective solution is to use image processing and artificial intelligence, particularly the Convolutional Neural Network (CNN) method, which can recognize patterns in images to classify weather conditions such as sunny, cloudy, or rainy.

This study uses the MobileNetV2 architecture, a type of CNN known for producing lightweight and efficient models while maintaining high accuracy. MobileNetV2 is chosen because it works well on devices with limited computing power and has proven to be effective for image classification tasks. The process involves collecting data from Kaggle, resizing images to a uniform size, training the model using training data, and evaluating its performance in classifying weather images.

The dataset consists of 768 images divided into three categories: sunny (253 images), cloudy (300 images), and rainy (215 images). 80% of the data was used for training and the remaining 20% for testing. The best results were achieved using the following configuration: **Stochastic Gradient Descent (SGD) optimizer**, **learning rate of 0.01**, **batch size of 32**, and **50 epochs**. With this setup, the system achieved an accuracy of **96.10%**, along with high precision, recall, and F1-score values. These results demonstrate that MobileNetV2 is highly effective for weather classification tasks

Keyword : Weather, Classification Weather, Convolutional Neural Network (CNN), MobileNetV2, Stochastic Gradient Descent (SGD), Learning Rate, Batch Size, Epochs.

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