A RELAIBLE AND ROBUST DEEP LEARNING MODEL FOR EFFECTIVE RECYCLABLE WASTE CLASSIFICATION

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ABSTRACT

In the waste management process, waste categorization is a crucial phase that aids in identifying the different categories of trash and their appropriate handling methods. Conventional garbage classification techniques are often labor-intensive and manual, which increases the risk of mistakes and inconsistent results. There is a need for more precise and effective trash classification techniques due to the growing volume of waste produced worldwide. Automating garbage classification has demonstrated encouraging results when using machine learning approaches, such as deep learning algorithms. The VGG architecture, one of these algorithms, has attained state-of-the-art performance on several benchmarks and is commonly employed for image classification applications. The VGG architecture, which consists of numerous convolutional and pooling layers before numerous fully linked layers, can learn complex image features. In this research, we provide an approach that makes use of the Visual Geometry Group (VGG) algorithm and YOLO (You only look only) algorithm for smart waste classification. The suggested approach entails teaching a deep convolutional neural network (CNN) with the VGG architecture in order to categorize garbage photos into groups including organic, paper, plastic, glass, and metal. Additionally, train to increase the accuracy of the model, a sizable dataset of garbage photos is used for training (pre-processing and augmentation). The suggested approach's efficacy in smart waste categorization is demonstrated by evaluating it on a test dataset and contrasting it with other cutting-edge techniques. The suggested approach may effectively categorize waste photos, according to the results, which can enhance waste management procedures and lessen pollution in the environment.

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