ABSTRACT

IMPLEMENTATION OF CONVOLUTIONAL NEURAL NETWORK (CNN) ALGORITHM FOR GARBAGE CLASSIFICATION

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In previous studies, the Convolutional Neural Network (CNN) algorithm obtained high accuracy in object classification and classification, but still has several problems such as high computational and long data training time. In previous studies regarding garbage classification using the CNN algorithm, high accuracy was obtained, but the class used for classification required more varied categories. In several previous studies, the use of the MobileNetV2 architecture can produce high accuracy and can overcome the need for excessive computing resources. The model used in this research uses Transfer Learning Technique with feature extraction and fine tuning of the MobileNetV2 architecture to classify the types of waste. The data collection used is household waste image data which is classified into 12 classes, namely paper, cardboard, biology, metal, plastic, green glass, brown glass, white glass, clothing, shoes, batteries, and waste residue. The dataset used comes from the Garbage Classification dataset on the Kaggle website. By using Transfer Learning technique, namely fine-tuning the MobileNetV2 architecture, training results are 98% accuracy, testing accuracy is 96%, precision is 95% and recall is 95% with 10 epochs, and the training time is less than 2 hours.

Keyword*: *Convolutional Neural Network*, *Deep Learning*, *MobileNetV2*, *Garbage*, *Classification