IMPLEMENTATION OF THE CONVOLUTIONAL NEURAL NETWORK METHOD IN MOBILE-BASED WASTE RECOGNITION LEARNING MEDIA

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ABSTRACT

The development of waste generation in Indonesia has exhibited a marked upward trend, with data indicating a substantial increase in waste production. In 2021, the recorded waste volume amounted to 28,459,222 tons, and by 2022, this figure had escalated to 37,430,231 tons. Households constitute the predominant contributor, accounting for 39.56% of the total waste generation. Despite the implementation of various management efforts, approximately 11,863,492 tons of waste are still not adequately managed on an annual basis. In light of this significant waste generation, this research proposes the development of a learning media-based mobile application that aims to enhance public awareness and knowledge about waste management. This application integrates an intelligent system with a Convolutional Neural Network (CNN) approach to support the automatic identification and classification of waste. A notable feature of the application is its capacity to detect waste in the surrounding environment, thereby promoting proper waste disposal behavior. From the various models tested, MobileNet V2 recorded the best performance with an accuracy of 99.88% based on the analysis of accuracy plot and confusion matrix. User Acceptance Testing recorded a score of 91.33% indicating that the EcoQuest application has met the eligibility criteria as a learning media for waste recognition.

Keywords: *Convolutional Neural Network*, *MobileNet*, *waste classification*, *learning media*