Abstract

Waste classification has always been important in environmental protection, resource recycling, and social livelihoods. Waste classification is a vital component of the primary waste management plan, essential for sustainable management. The waste is typically generated by home or industrial processes. Various waste types should be accurately classified and treated to benefit the environment and the economy. The majority of the waste sorting process is done manually, which poses several health risks for the workers and it also time consuming. Correct and precise waste classification is one of the pillars of effective waste management. Either directly or indirectly, waste disposal affects human life and the environment. Reducing the negative consequences of waste products can be achieved by using an effective waste management system. Both human trash classification and automated waste classification, using a range of procedures, are being used to classify and separate waste. However, it is challenging for humans to distinguish between such a large and diverse volume of trash. Therefore, to efficiently organize the garbage, deep learning will be used.

This work suggests a deep learning-based system for sorting trash using photographs into four different waste types (glass, paper, plastic, and cardboard). A simple sequential CNN model and two pre-trained models, MobileNet V2 and VGG-16, were used to categorize waste from a manually collected waste dataset. VGG-16 outperformed the other two models in terms of accuracy (92%). It is anticipated that the suggested waste categorization system will improve garbage recycling efforts by enabling automated trash segregation with little to no human intervention.