UNIVERSITI TEKNOLOGI MARA

AN INTERNET OF THINGS BASED FOR SMART RECYCLE WASTE CLASSIFICATION

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ABSTRACT

Innovative solutions utilising modern technologies have been created in response to the growing global concern for effective waste management and recycling practises. This thesis introduces a smart recycle waste categorization system built on the Internet of Things (IoT) with the goal of automating and improving waste sorting procedures. To accurately categorise waste into the categories of metal, paper, plastic, and maybe other waste types, the system uses an image classification model based on the ResNet algorithm. A large dataset that included a range of waste images was aquired in order to train the classifiction model. With a high accuracy rate for waste classification, the ResNet algorithm proved to be effective. Real-time monitoring of the smart bin's capacity is made possible by the integration of IoT capabilities, and users of the Blynk app receive notifications through email as a result. The suggested system provides a dependable, automated, and flexible alternative to the drawbacks of traditional waste sorting techniques. The approach improves waste sorting accuracy by extending the classification model to incorporate additional waste types and adding a "reject" class for unclassifiable or irrelevant images. As a result, recycling procedures are enhanced, and sustainable waste management is promoted. The results of this study show how the Internet of Things and image classification algorithms have the potential to rerevolutionizearbage classification and management. An effective way to streamline waste sorting procedures and enable effective recycling techniques is to deploy the smart recycle waste classification system. This technology is expected to significantly influence waste management initiatives, fostering sustainability and environmental protection.

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