# **Smart Waste Sorting and Recycling System**

This repository contains the code and resources for a Smart Waste Sorting and Recycling System using deep learning. The project aims to classify waste images into organic and recyclable categories to improve waste management and recycling processes.

## **Introduction**

Efficient waste management is crucial for environmental sustainability. This project leverages convolutional neural networks (CNNs) to develop an automated waste sorting system. The model is trained on a dataset of 22,500 images of organic and recyclable waste, utilizing data augmentation techniques to improve robustness.

## **Dataset**

The dataset consists of 22,500 images, split into training and validation sets.

The images are categorized into two classes:

* Organic
* Recyclable

## **Model Architecture**

The CNN model is designed with several convolutional and pooling layers, followed by fully connected layers and a dropout layer to prevent overfitting. The model is compiled using binary cross-entropy loss and the Adam optimizer.

## **Results**

The model achieves approximately 90% accuracy on the validation set. Detailed performance metrics, including confusion matrix and classification report, are provided in the results directory.