WASTE CLASSIFICATION

01

Helps in determining the appropriate management, treatment, and disposal methods to minimize environmental impact and health risks.

DATASET: Waste Classification Data

Source: Kaggle.com

CNN IN WASTE CLASSIFICATION

03

1. **Image input:**
An image of the waste item is taken.
2. **Feature extraction:**
The CNN processes the image through its layers, identifying features that distinguish different types of waste.
3. **Classification:**
Based on the features, the CNN predicts the category of the waste (e.g., plastic, paper, metal).
This automated process makes sorting waste faster and more accurate.

IMPLEMENTATION STEPS

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01 → **Data Collection**

02 → **Data Preprocessing**

03 → **Data Splitting**

04 → **Model Training**

05 → **Model Evaluation**

PAPER garbage METAL garbage GLASS garbage

PLASTIC garbage ORGANIC garbage ELECTRONIC garbage

Stage 1: Localization. Detect litter with object detector

Input image → Detect litter → Region proposal → Detection results

Crop predicted bboxes

Stage 2: Classification. Classify detected litter

8 classes

Not litter: background (0)
Litter: bio (1), glass (2), metals and plastic (3), non-recyclable (4), paper (5), other (6), unknown litter (7)
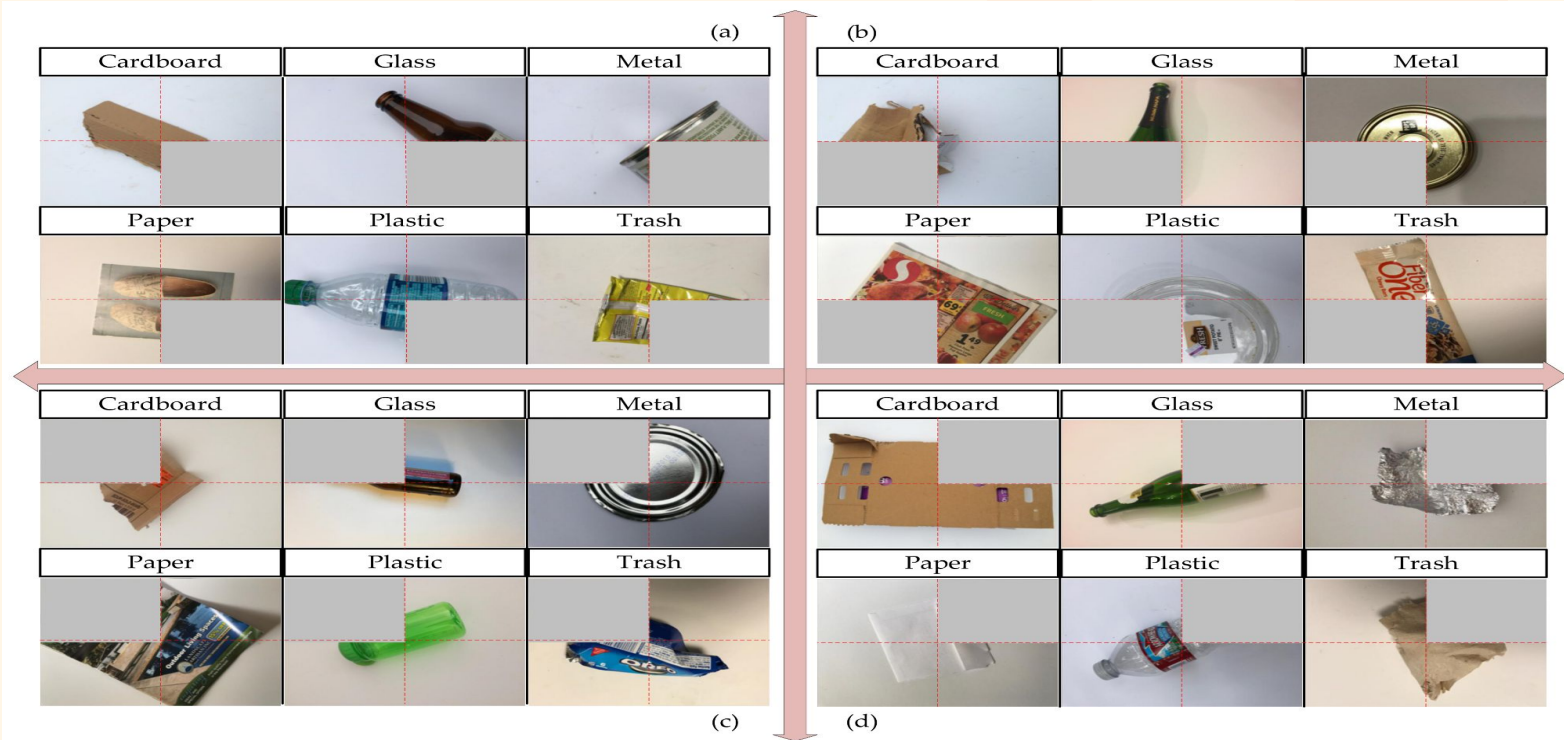
Classify proposed objects

Proposed objects to classify

Litter: Paper
Litter: Metals and Plastic
Not litter: Background

Classification results

Remove false positives and visualize results

WASTE CLASSIFICATION OUTPUT

CONCLUSION

Convolutional Neural Networks (CNNs) significantly enhance waste classification by automating the identification and sorting of diverse waste materials. Through robust training on diverse datasets, CNNs achieve high accuracy and efficiency in categorizing waste. Integration with real-time monitoring and robotic systems streamlines waste management processes, reducing manual labor and improving recycling rates.

THANK YOU

FOR YOUR ATTENTION & PATIENCE