

# **Application User Guide**

**RealWaste: AI-Powered Waste Classification System**

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# 1. Introduction

The RealWaste Web Application is an AI-powered image classification tool designed to help users identify different categories of waste using machine learning. The system analyses an image uploaded by the user and predicts the correct waste category, supporting improved recycling and sustainability practices.

This guide explains how to access the system, upload an image, interpret the results, and troubleshoot common issues.

## 2. System Requirements

To use the RealWaste application, users only need:

- A device with an internet connection (laptop, PC, tablet, or mobile).
- A modern web browser such as:
  - Google Chrome
  - Microsoft Edge
  - Mozilla Firefox
  - Safari

No installation or plugins are required.

## 3. Accessing the Application

1. Open a web browser.
2. Enter the following URL:  
<https://trio-trashy-realwaste-classification.onrender.com>
3. The homepage will load automatically and display the main interface for image upload.

## 4. Application Features

### 4.1 Image Upload

Users can upload an image of waste using:

- **Upload Button** (Browse file from computer)
- **Drag and Drop** (If supported by your app)

Supported file types:

- .jpg
- .jpeg
- .png

## 4.2 AI Classification Engine

After uploading, the AI model processes the image and predicts a waste category such as:

- Glass
- Plastic
- Metal
- Miscellaneous Trash
- Cardboard
- Paper
- Textile Trash
- Food Organics
- Vegetation

## 4.3 Result Display

Results typically include:

- **Predicted Waste Category**
- **Confidence Score (%)**
- **Waste Item Preview** (the uploaded image)
- **Short Description** (how to dispose responsibly)

# 5. How to Use the Application

Follow these simple steps to classify an image:

### Step 1: Open the Web App

Go to: <https://trio-trashy-realwaste-classification.onrender.com>

### Step 2: Upload an Image

- Click the **Upload** or **Choose File** button.
- Select a waste image from your device.
- Wait for the system to upload the file.

### **Step 3: Run Classification**

After uploading, the app will automatically process the image OR you may need to click a **Predict / Classify** button (depending on your version).

### **Step 4: View Results**

The result page will show:

- The predicted waste category
- Confidence score
- The waste image you submitted

### **Step 5: Try Another Image**

Click **Upload Another Image** to restart the process.

## **6. Interpretation of Results**

### **Predicted Category**

This is the AI's best guess of what type of waste is in your image.

### **Confidence Score**

Indicates how certain the AI model is.

Example:

- 92% = Very high confidence
- 60% = Medium, image may be unclear

### **Why Certain Images May Misclassify**

- Low light
- Blurry photos
- Multiple items in the same picture
- Items resembling other waste categories

## 7. Limitations

The current system may have the following limitations:

- Works best with **single object images**
- Does not detect **multiple waste items**
- Accuracy depends on the trained dataset
- Results may vary based on lighting and image quality

## 8. Troubleshooting

Issue	Possible Cause	Solution
Image does not upload	File too large or unsupported format	Use .jpg/.png and size < 5MB
Page loads slowly	Hosting platform loading time	Refresh, or wait 10–20 seconds
Wrong classification	Poor image quality	Re-take the photo with clear lighting
“App not responding”	Render free tier sleeping	Wait 1–2 minutes, then refresh

## 9. Contact & Support

For technical issues or improvements, please contact the development team.

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## 10. Version Information

- Application Version: 1.0
- Model Type: Image Classification (CNN / MobileNet / etc.)
- Deployment: Render Web Service