EcoVision

Tagline:
"See waste. Know its impact."

🚀 Core Idea

A **web app** that uses **AI + OpenCV** to identify whether an image shows **biodegradable or non-biodegradable** waste and estimates its **eco-impact score**.

🔍 Overview

Feature	Description
Input	User uploads or captures an image of waste (plastic bottle, paper, banana peel, etc.)
Process	The model (trained using OpenCV + CNN or pretrained MobileNet) classifies it into `biodegradable` or `non-biodegradable`
Output	Displays: waste type, eco-impact score (1–10), and a tip (e.g., "This item takes 400 years to decompose.")

🧩 Dataset (Simple & Free)

You can build or use:

- **Kaggle dataset:** *"Waste Classification Data"*
  🔗 https://www.kaggle.com/datasets/techsash/waste-classification-data
    - 2 main classes: *Organic* (biodegradable) and *Recyclable* (non-biodegradable).
    - Perfect for OpenCV + CNN.

🧠 Model

Step	Description
Preprocessing	Resize images to 224×224, normalize pixel values.
Model	CNN (or pretrained MobileNetV2 for better accuracy).
Output Classes	2 → `Biodegradable`, `Non-Biodegradable`.
Training	Use TensorFlow/Keras with 80–20 train-test split.

⚙️ Basic System Design

Frontend:

- HTML + CSS + JS (upload image, display results)

Backend (Flask):

- `/predict` route → takes uploaded image
- Processes via OpenCV
- Passes to model → returns result
- Displays “Type + Eco Impact Score + Tip”

Storage:

- Local folder for uploaded images
- (Optional) SQLite for logs or user history

🧭 Prototype Flow

1. **Home Page:** “Upload a Waste Image”

2. **Backend:** Flask sends to model for prediction
3. **Output Page:** Shows:
    - Classification result
    - Eco impact score (e.g., 2/10 = biodegradable)
    - A green tip (“Compost organic waste to enrich soil”)

⏳ 3-Week Timeline

Week	Milestone
Week 1	Research + Collect Dataset + Preprocess images
Week 2	Train CNN or MobileNetV2 + Test model accuracy
Week 3	Build Flask web app + Integrate model + UI polish

🌱 Optional Future Add-ons

- Add a **Leaderboard** for users recycling the most.
- Integrate **Google Maps API** to show nearby recycling centers.
- Gamify the experience — users earn “eco-points.”
