**Trashy - Automated Sorting. Sustainable Living.**
*A Project for Sustainable Waste Management*

**What is Trashy?**

Trashy is a smart waste sorting system that uses a self-trained artificial intelligence, a camera, and mechanical components to automatically identify whether an item belongs to paper, plastic, or general waste and sorts it into the appropriate bin.

**How Trashy Works**

A camera takes a picture of the item. The AI, trained using Google's Teachable Machine, classifies the item. A stepper motor then activates a conveyor belt to move the item to the correct bin. The bins are mounted on a rotating platform that automatically turns to the needed position.

An ultrasonic sensor measures the bin's fill level after each disposal. This data is sent to a web interface and can be accessed at any time.

**Technology Overview**

- Image recognition powered by TensorFlow Lite
- Fast classification based on probability
- Automatic rotation of the turntable to the correct bin
- Precise movement of items via stepper motor and conveyor belt
- Real-time fill level monitoring via ultrasonic sensors
- Data transmission to web dashboard; cached if offline

**Sample Workflow**

1. Camera captures image
2. AI classifies: e.g., "Paper" (with 93% probability)
3. Turntable rotates to paper bin
4. Conveyor belt moves item into bin
5. Fill level is measured (e.g., 37%)
6. System transmits status to web dashboard

**Why Trashy?**

- Supports sustainable waste handling
- Implements practical technologies in an academic context
- Combines hardware, software, and AI
- Enables transparent monitoring through real-time data

**Technologies Used**

- Raspberry Pi
- Python
- HTML, CSS, JavaScript
- TensorFlow Lite
- Google Teachable Machine
- Ultrasonic sensors (HC-SR04)
- Stepper motors and conveyor belt system
- REST API-based web interface

**Project Team**

**Felix Lang, Sinan Licina, Marius Mattes, Andre Schambach**

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