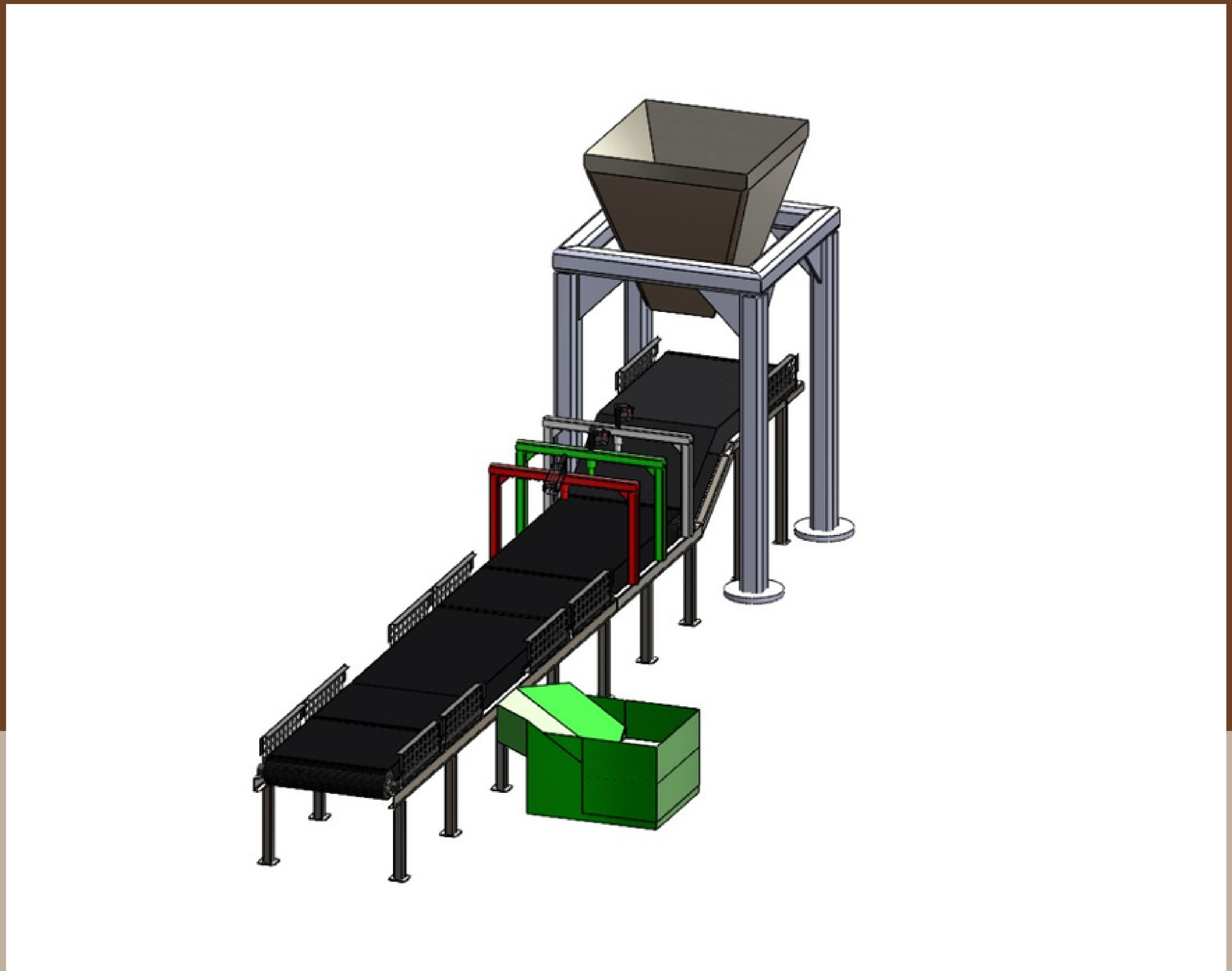
Model Description

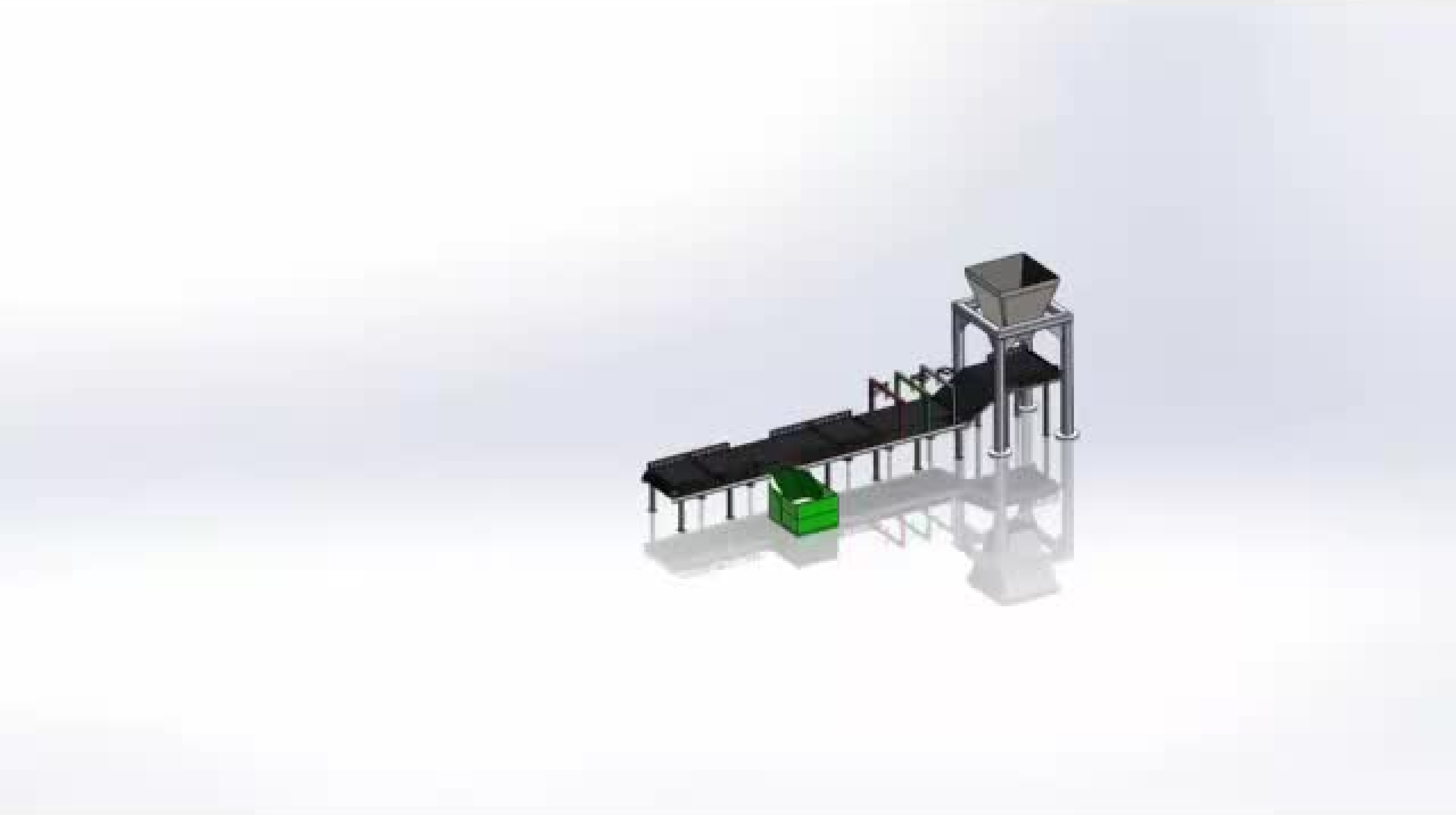
Welcome

Intro

The AI Recycling System, meticulously crafted using SolidWorks, represents a groundbreaking solution in the realm of sustainable waste management. This innovative design seamlessly integrates cutting-edge Artificial Intelligence (AI) technology with precision engineering to revolutionize the recycling process.



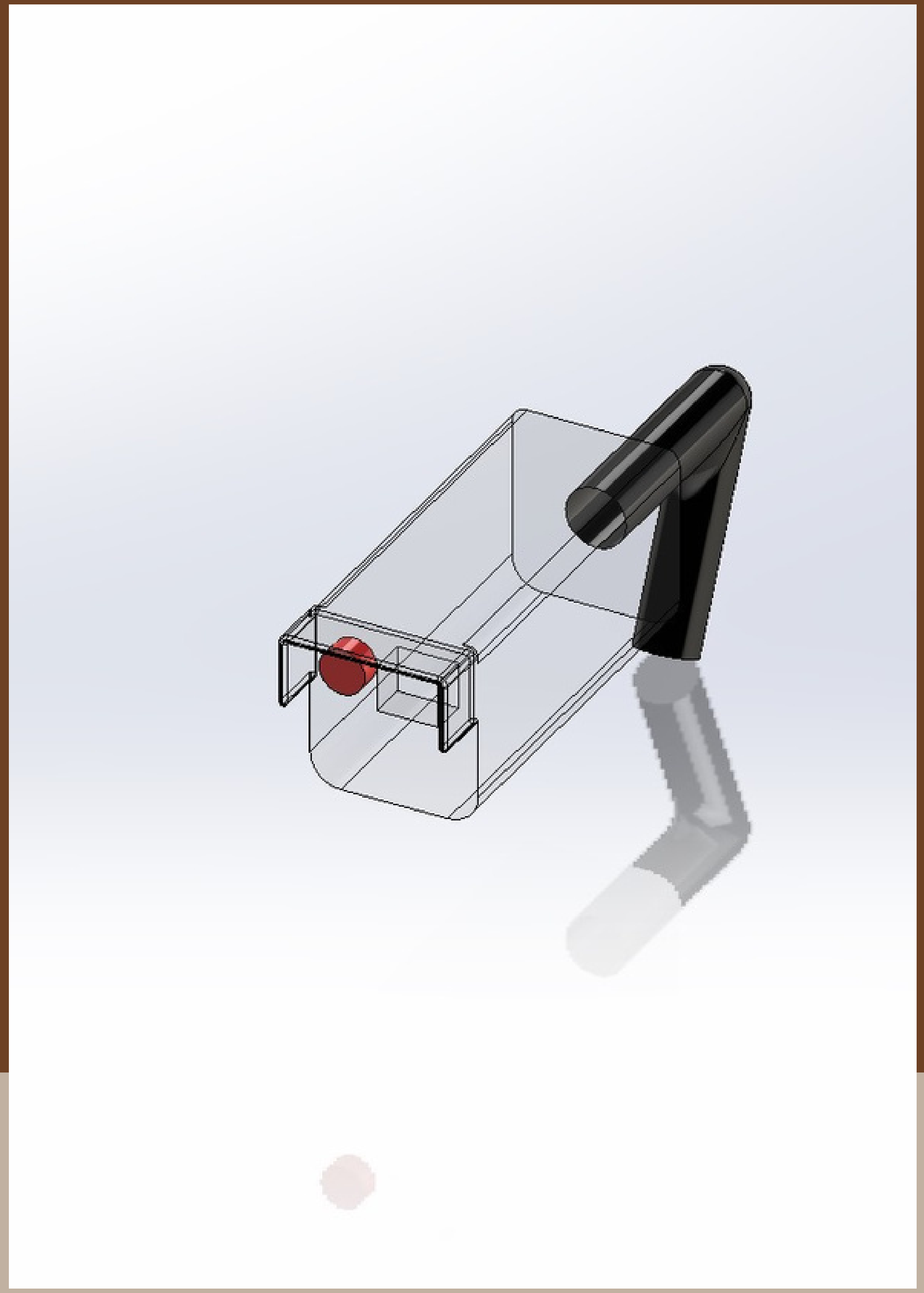
Model



Features

1- AI-Driven Sorting Mechanism

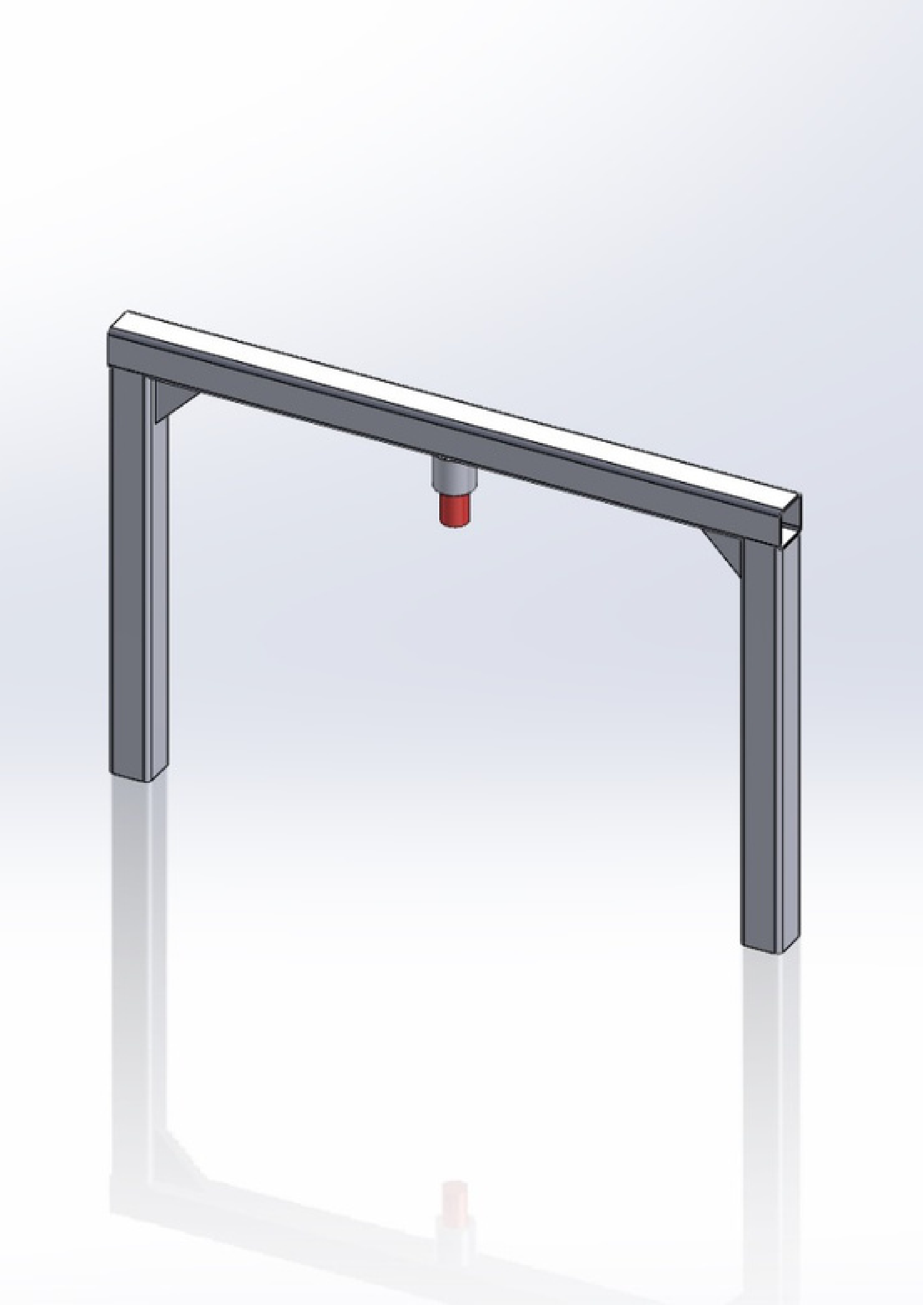
The heart of the system lies in its advanced AI sorting mechanism. It employs camera vision and machine learning algorithms to identify and sort recyclable materials with unparalleled accuracy.



Features

2- High-Speed Optical Sensors

Equipped with Spectrographic Sensor, the system scans and identifies recyclables in real-time, distinguishing between materials like plastics, glass, and paper



Features

3- User-Friendly Interface

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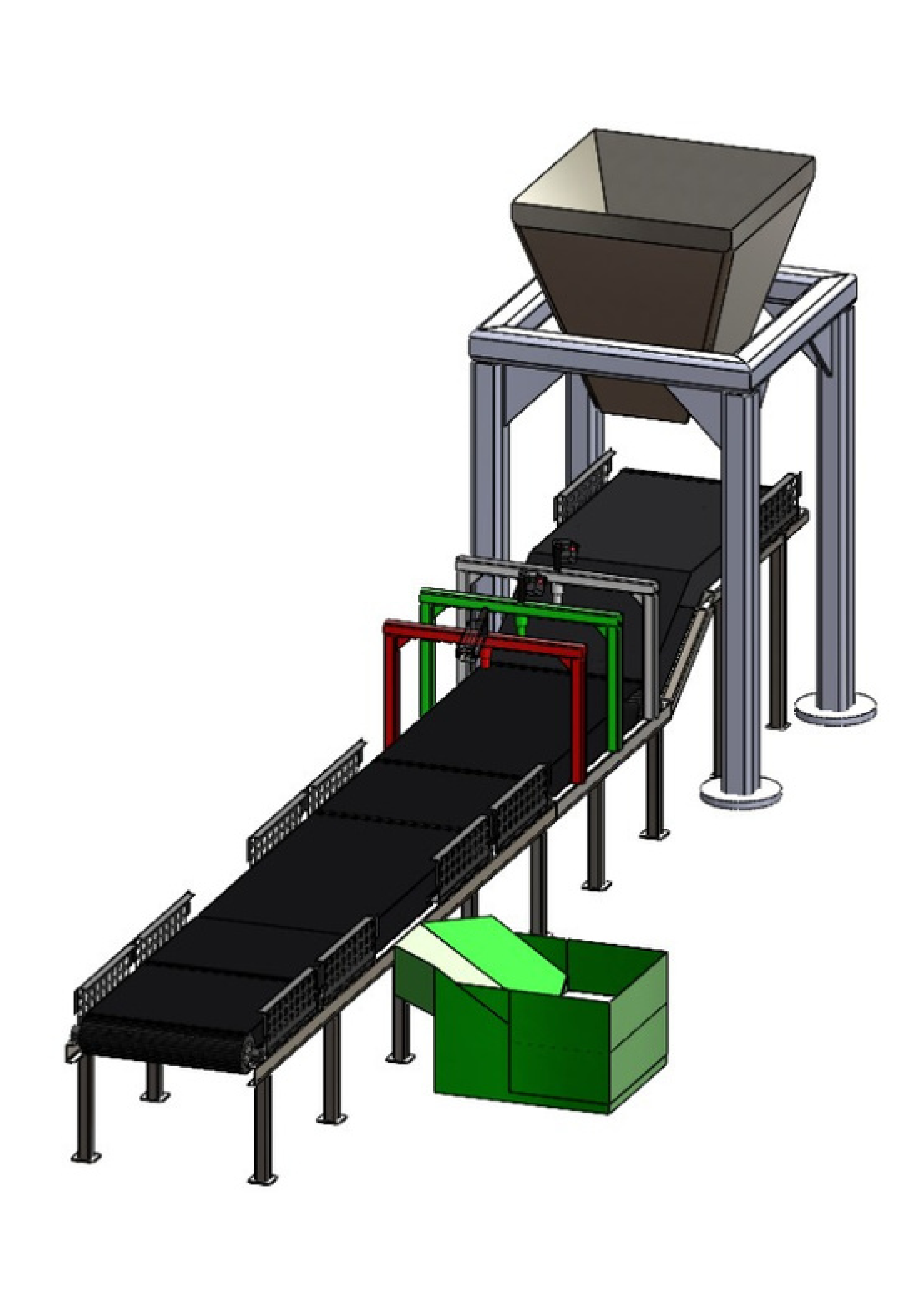


Program

```
import cv2
import numpy as np

# Load the YOLO model and configuration files
net = cv2.dnn.readNet("yolov3.weights", "yolov3.cfg")

# Load the COCO class names
classes = []
with open("coco.names", "r") as f:
 classes = f.read().strip().split('\n')
```

Program

```
# Initialize the camera
cap = cv2.VideoCapture(0)
while True:
 # Capture a frame from the camera
 ret, frame = cap.read()
 # Perform object detection
 blob = cv2.dnn.blobFromImage(frame, 0.00392, (416, 416), (0, 0, 0), True, crop=False)
 net.setInput(blob)
 outs = net.forward(net.getUnconnectedOutLayersNames())
```

Program

```
class_ids = []
 confidences = []
 boxes = []
 # Process detected objects
 for out in outs:
 for detection in out:
 scores = detection[5:]
 class_id = np.argmax(scores)
 confidence = scores[class_id]
 if confidence > 0.5:
```

Program

```
# Object detected with confidence > 0.5
center_x = int(detection[0] * frame.shape[1])
center_y = int(detection[1] * frame.shape[0])
w = int(detection[2] * frame.shape[1])
h = int(detection[3] * frame.shape[0])

# Rectangle coordinates
x = int(center_x - w / 2)
y = int(center_y - h / 2)
```

Program

```
  boxes.append([x, y, w, h])
 confidences.append(float(confidence))
 class_ids.append(class_id)
indexes = cv2.dnn.NMSBoxes(boxes, confidences, 0.5, 0.4)

# Process the detected objects
 for i in range(len(boxes)):
 if i in indexes:
 label = str(classes[class_ids[i]])
 confidence = confidences[i]
```

Program

```
# Draw a rectangle around the detected object
cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 255, 0), 2)
cv2.putText(frame, label, (x, y - 10), cv2.FONT_HERSHEY_SIMPLEX, 0.5, (0, 255, 0), 2)

# Display the frame
cv2.imshow("Waste Classification", frame)

# Press 'q' to exit the loop
if cv2.waitKey(1) & 0xFF == ord('q'):
break
```

Program

```
# Release the camera and close all windows
cap.release()
cv2.destroyAllWindows()
```

In this Program

- We load the YOLO model for object detection along with its configuration and class names.
- We initialize the camera using OpenCV.
- Inside the main loop, we continuously capture frames from the camera and perform object detection on each frame.
- Detected objects are classified as either biodegradable or non-biodegradable based on the classes defined in the coco.names file.
- The program draws bounding boxes around the detected objects and displays the frame with object labels.
- Press 'q' to exit the program.

Pricing

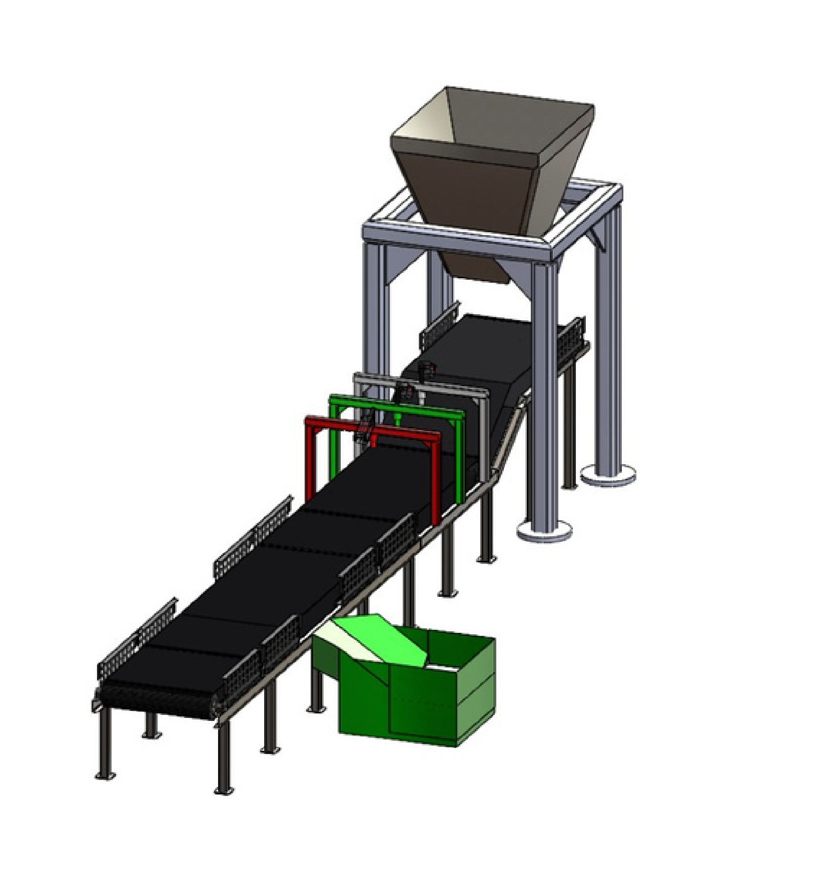
Camera	3	200$ to 2000$
Sensors	1	1000$ to 10000$
Frame	As per Required	$0.15 to $0.40 per pound
Conveyer Belt	1	3000$ to 15000$
Hydraulic Press	2	500$ to 2000$
Total(appox)		4250$ to 29000$

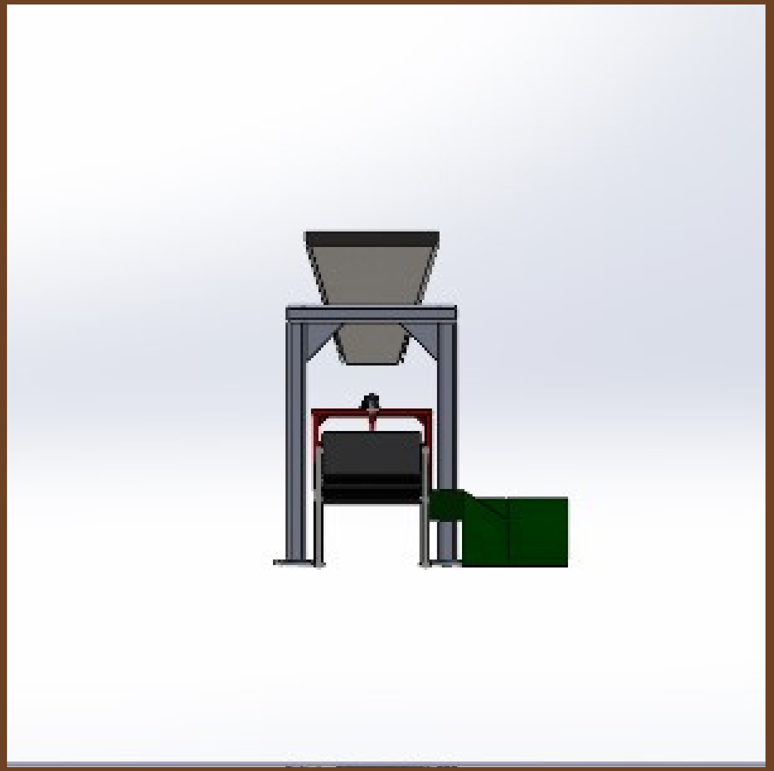
Benifits

- **Enhanced Recycling Efficiency**
- **Cost Savings**
- **Environmental Impact**
- **Scalability**

Conclution

Our AI Recycling System, brought to life through SolidWorks, represents a technological leap in recycling automation. Its precision, adaptability, and sustainability focus promise a brighter and cleaner future for waste management. With this design, we're taking a giant step towards a greener planet





Thanks