



edunet
foundation

E-Waste Generation Using ResNet50 for Sustainable Recycling Solutions



- Understand the use of transfer learning in computer vision.
- Train a deep learning model (ResNet50) for image classification.
- Build a simple interactive UI with Gradio for real-time prediction.
- Apply AI to solve environmental challenges related to e-waste.

Source: Dataset collected and organized manually (10 e-waste categories)

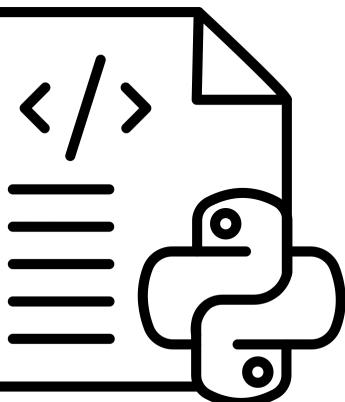
<https://www.kaggle.com/datasets/akshat103/e-waste-image-dataset>



Programming & Development:

Python – Core language

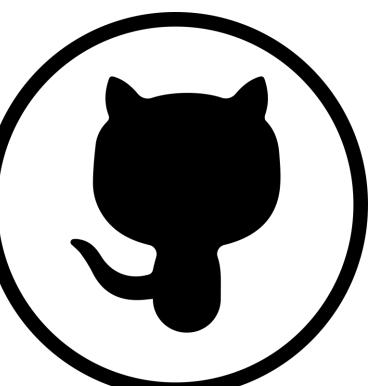
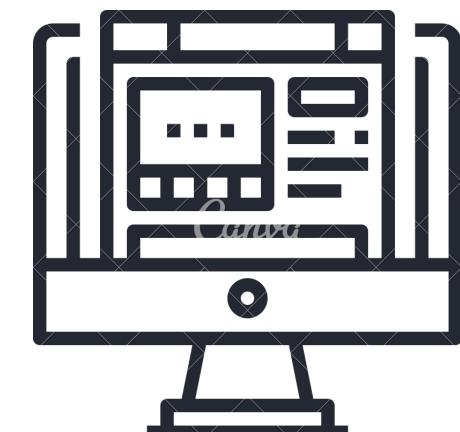
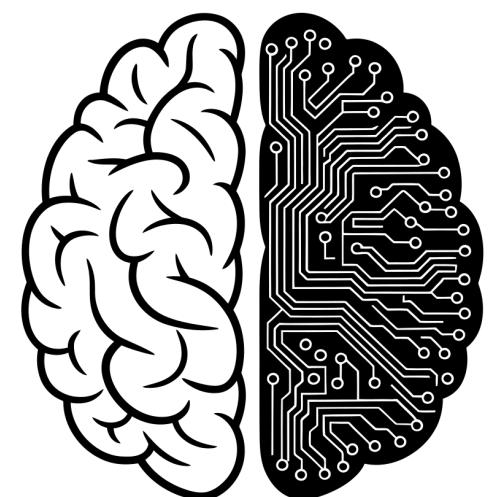
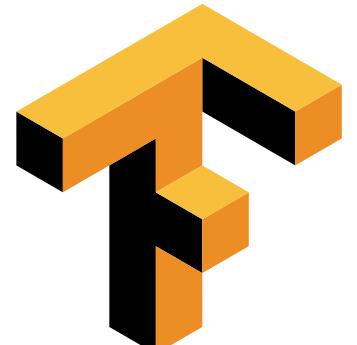
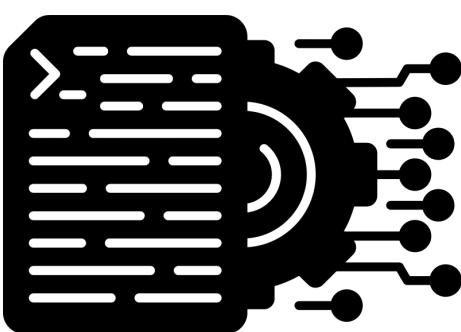
Jupyter Notebook – Code execution & visualization.



Machine Learning Frameworks:

TensorFlow / Keras – Model building & training

ResNet50 – Transfer learning for image classification

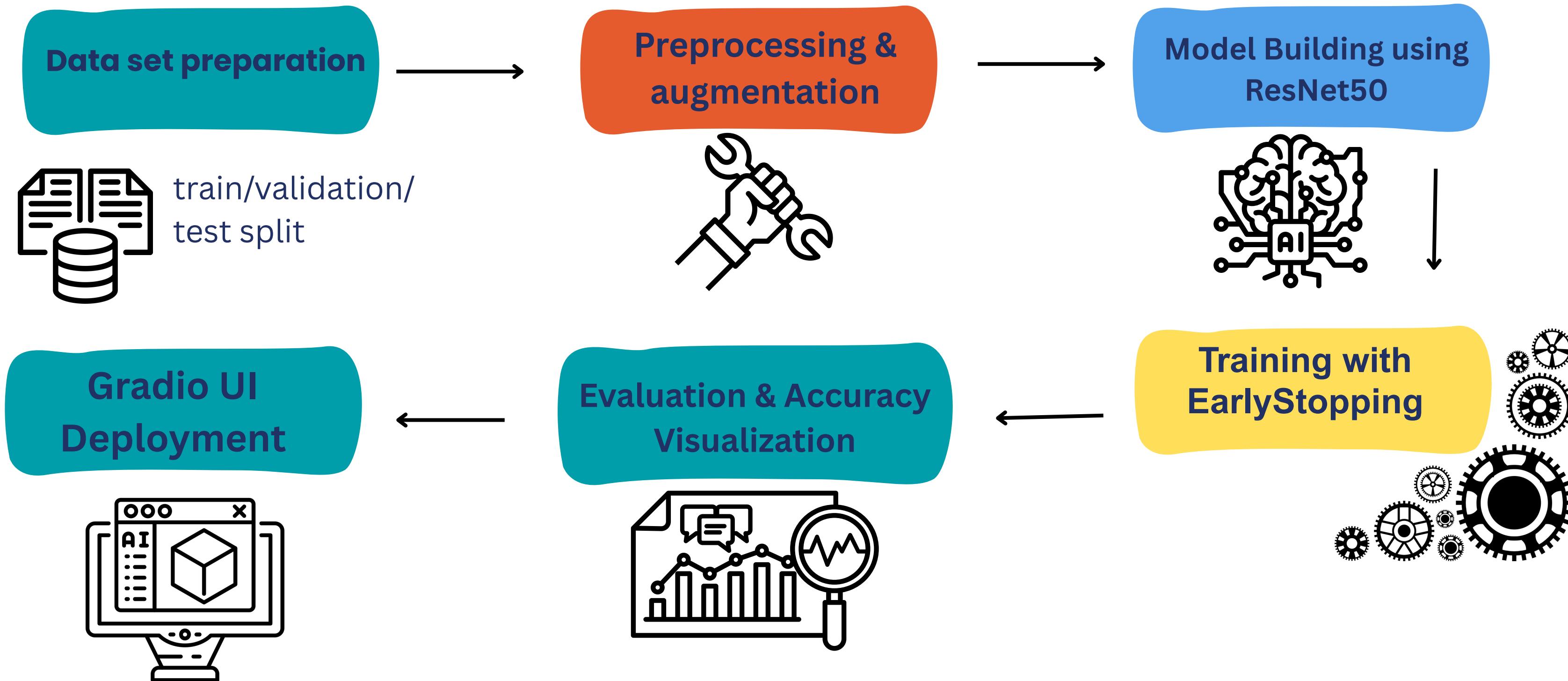


Web Deployment:

Gradio – Real-time interactive UI

Version Control & Hosting:

GitHub – Project repository and collaboration



**India generates over 3.2 million metric tons of e-waste every year.
Manual sorting methods are inefficient and prone to error.
This leads to improper recycling and environmental harm.
An automated, intelligent system is needed for effective classification.**



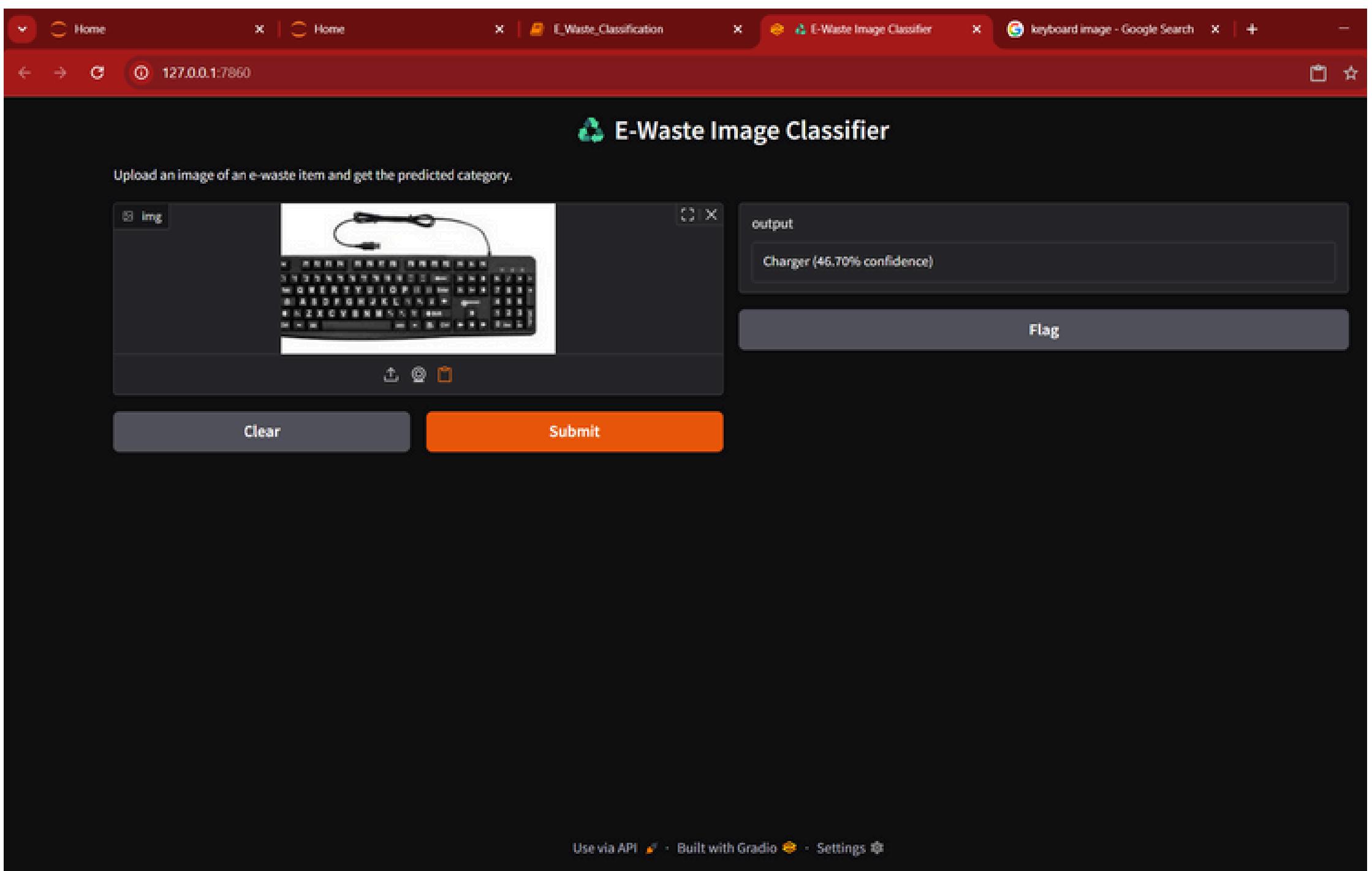
Solution:

To address the inefficiency of manual e-waste sorting, a deep learning model using ResNet50 is developed to automatically classify e-waste images into predefined categories. This model is integrated with a Gradio-based user interface to enable real-time predictions and promote smarter recycling practices.



Screenshot of Output:

The Gradio interface allows real-time image upload and accurately classifies the e-waste item with confidence.



Conclusion:

- This project successfully demonstrates how deep learning and Gradio can automate e-waste classification, promoting faster sorting and supporting sustainable recycling efforts.

