

ECOWISE: AI-BASED WASTE IMAGE CLASSIFICATION SYSTEM

S24CSEU0693 – ISHANT SINGH CHAUHAN

S24CSEU0679 – JALAJ BHATIA

S24CSEU0513 – SHORYA GUPTA

PROBLEM STATEMENT

- BUILD A WEB APP THAT CLASSIFIES UPLOADED IMAGES (E.G., BOTTLE, BATTERY) AND SHOWS CLASS PROBABILITIES.
- WASTE MISCLASSIFICATION LEADS TO POLLUTION AND IMPROPER DISPOSAL
- HUMANS CANNOT MANUALLY SORT LARGE AMOUNTS OF WASTE ACCURATELY
- NEED FOR AN AUTOMATED, FAST, AND RELIABLE WASTE IDENTIFICATION SYSTEM

PROPOSED SOLUTION

EcoWISE PROVIDES AN AUTOMATED WASTE IDENTIFICATION SYSTEM USING AI. THE SOLUTION CLASSIFIES WASTE IMAGES IN REAL-TIME AND PROVIDES THE CORRECT CATEGORY ALONG WITH CONFIDENCE PERCENTAGE.

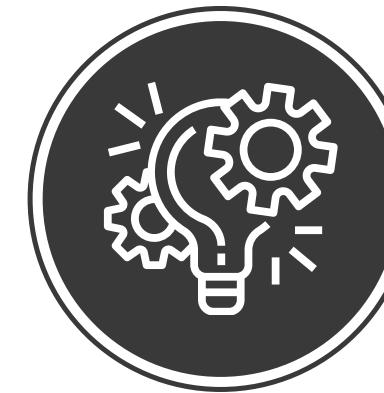
BUILD A RESPONSIVE FRONTEND WHERE USERS CAN UPLOAD AN IMAGE. DISPLAY PREDICTION WITH CONFIDENCE LEVEL AND CATEGORY-WISE DISPOSAL GUIDANCE.

PROVIDE INSIGHTS AND VISUALIZATIONS USING CHARTS AND INTERACTIVE UI ELEMENTS.

GOALS AND OBJECTIVES



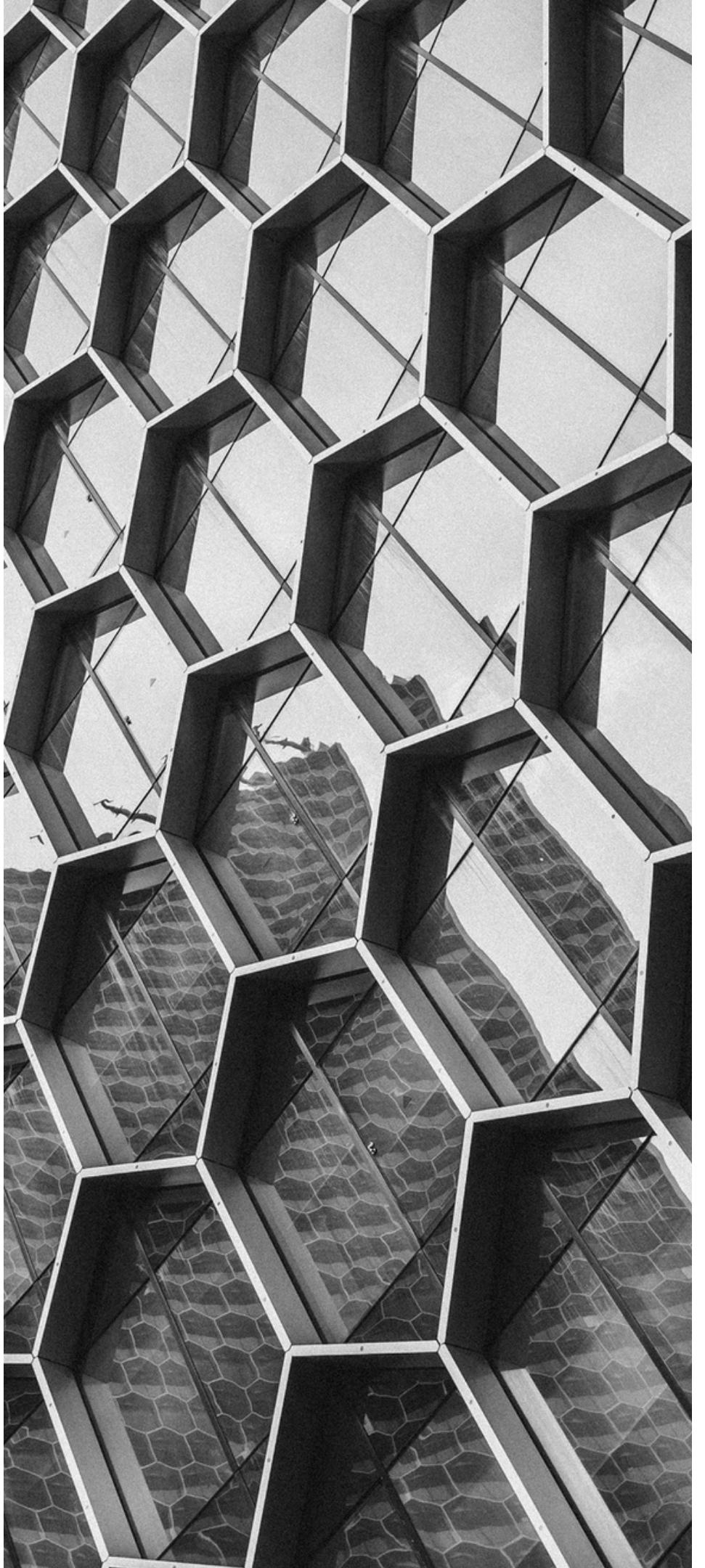
- ACCURATE WASTE CLASSIFICATION
- FAST AND USER-FRIENDLY SYSTEM
- SUPPORT SMART RECYCLING AND ENVIRONMENTAL AWARENESS



- TRAIN A HIGH-ACCURACY AI MODEL
- IMPLEMENT RESPONSIVE FRONTEND



- DISPLAY PREDICTION RESULTS WITH CONFIDENCE.
- MAINTAIN CLASSIFICATION HISTORY AND ANALYTICS.
- PROVIDE CATEGORY-WISE RECYCLING INSTRUCTIONS



TECHNOLOGY USED

- PROGRAMMING LANGUAGES: PYTHON, JAVASCRIPT, HTML, CSS
- ML LIBRARY: TENSORFLOW/KERAS (MOBILENETV2 TRANSFER LEARNING), ULTRALYTICS(YOLO V8)
- BACKEND: FLASK, OPENCV
- DATABASE: MYSQL
- FRONTEND: HTML/CSS/JS, CHART.JS, THREE.JS

KEY FEATURES OF ECOWISE

GALLERY VIEW WITH
DELETE OPTION

RECYCLING GUIDE
PER CATEGORY

SMOOTH ANIMATIONS
& GLASSMORPHISM
UI

REAL-TIME WASTE
IMAGE
CLASSIFICATION

CONFIDENCE SCORE
DISPLAY

CLASSIFICATION
HISTORY AND CHART-
BASED ANALYTICS

FUTURE PROSPECTS

1. MULTI-OBJECT DETECTION

ENABLE THE SYSTEM TO DETECT AND CLASSIFY MULTIPLE WASTE ITEMS IN A SINGLE IMAGE, IMPROVING REAL-WORLD USABILITY.

2. MOBILE APP & ON-DEVICE AI

DEVELOP A DEDICATED MOBILE APPLICATION WITH OPTIMIZED ON-DEVICE INFERENCE FOR FASTER, OFFLINE CLASSIFICATION.

3. CLOUD DEPLOYMENT

DEPLOY THE AI MODEL ON CLOUD SERVICES FOR FASTER PROCESSING, SCALABILITY, AND GLOBAL ACCESS.

4. EXPAND DATASET & ADD MORE CATEGORIES

INCREASE DATASET SIZE AND INTRODUCE ADDITIONAL WASTE CATEGORIES TO IMPROVE ACCURACY AND RELIABILITY.

5. REAL-TIME VIDEO CLASSIFICATION

ENHANCE THE SYSTEM TO CLASSIFY WASTE FROM LIVE VIDEO STREAMS FOR AUTOMATED SORTING STATIONS.

6. IoT SMART BIN INTEGRATION

INTEGRATE THE MODEL INTO IoT-ENABLED SMART BINS TO AUTOMATICALLY DETECT WASTE TYPES AND GUIDE USERS FOR PROPER DISPOSAL.

THANK
YOU!