Topic : Smart Industrial Waste Sorting Systems

Chapter 2

Introduction

# Chapter 03

## 3.1 Resource List

## 3.2 Specifications of Software Block Diagram using ML (Python Programming Language)

# Chapter 05

## 5.1 Data Sources: Public datasets, waste management facilities, and manually collected data.

## 5.2 Data Annotation: label the data for training machine learning models.

# Chapter 06 : Design & Development

## 6.1 Algorithm Development

6.1.(a) Machine Learning: develop classification models using Python libraries (TensorFlow, Keras, scikit-learn).

6.1.(b).Computer Vision: Implement image processing techniques (image of waste from dataset) with OpenCV.

6.1.(c)Integration: Combine machine learning and computer vision for sorting algorithms.

## 6.2 Simulation Environment Development

6.2.(a).Modelling: Create a simulation environment using SimPy to replicate the waste sorting process.

6.2.(b).Parameters: Define parameters such as waste input rate, sorting speed, and accuracy.

6.2.(c).Scenarios: Simulate different scenarios

## 6.3 Optimization Techniques Development

6.3.(a).Optimization Algorithms: apply genetic algorithms, particle swarm optimization, or other techniques to improve sorting efficiency.

6.3.(b).Performance Metrics: Measure sorting accuracy, speed, and throughput.

# Chapter 07 : Testing

## 7.1 Prototype Development: build a prototype system based on the optimised algorithms. (python Simulation )

## 7.2 Testing : test the prototype in a controlled environment with real waste samples.

# Chapter 08 : Analysis

## 8.1 Validation Result Analysis : validate the model’s accuracy and reliability.

## 8.2 Benchmarking: Compare the simulation results with real-world data.

## 8.3 Analysis of waste management efficiency : analyse the impact of optimised sorting on waste management efficiency in industry.

## 8.4 Reduction in Contamination: evaluate how improved sorting reduces contamination in recycling streams for the industry.

## 8.5 Resource Recovery: assess the increase in resource recovery rates for the industry.

## 8.6 Environmental Benefits: analyse the overall ecological benefits of industries, such as reduced landfill use and lower greenhouse gas emissions.

# Chapter 09 :

## 9.1 Monitoring Procedures for the model

## 9.2 Risk Assessment of the model

# Chapter 10 :

## 10.1 The work carried out to date

## 10.2 Conclusion

Give Some Diagrams Pie or Bar charts Table where necessary for better understanding Also level it.

Written report should be 9k words to maintain the points which are mentioned above and also relate to the project work and title area .

Please Do Not write in general concepts , relate it with the project workflow .Do Not copy paste from Chat Gpt . Use chat Gpt as a calculator .Paraphrase it, humanise it then write it according to the project concept.

Robotic writings easily can be detected so please avoid direct copy paste from chat gpt or others AI

Give a turnitin report

Provide 4 or 5 slide

give the speech of the slide in a different doc or word file

Give Python files in Colab format

Writings report in word or doc format

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