

INTELLIGENT GARBAGE CLASSIFICATION PLATFORM

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Abstract

Waste is everything that ready to be a substance of environment. The process of waste become substances of the environment is simply an act of living organisms in the natural lifecycle called recycle. However, humans produce raw materials that this natural life cycle cannot dispose of and that nonetheless overloads the capacity of the natural recycling process. So, these waste generation and disposal process should be managed to establish the balance of the natural life cycle.

Solid waste, liquid waste, e-waste, hazardous and non-toxic waste are basic categories of waste based on the source and characteristics of waste as well as the local and federal regulations. Households, schools, offices, hospitals and industries are common places that these can be generated and that may include food, plastic bottles, tins, glasses, fluids and carcasses, animal waste, medicine, light bulbs, batteries, pesticides, paint, books, mercury from thermometers, chemicals used in laboratory, cloths etc. This much heterogeneity of garbage which has constantly increased quantity with the population growth has a huge impact on the natural life cycle. So, dispose of then without causing any destruction to the environment is tremendously important.

The goal of this research is to assist that process of waste disposal by providing an AI-based solution. Currently, this procedure is undertaking municipal councils associated with commercial recycling companies or government contractors. Basically, they collected garbage from people, categorize them and suitably dispose of them. But the common disposal methods are open dumping and burning which, both causes permanent damages on the environment by polluting soil, air and water resources. So, the proposed solution will assist people to take their garbage to consumers (recyclers or other parties) by only tagging garbage images using a common platform where vendors and consumers can exchange their garbage on market price without causing any subsidiary damage to the environment.

This platform consists of garbage detection, classification and analysis modules which have implemented using Deep Neural Networks, TensorFlow APIs and libraries like OpenCV and more. Users will be provided with mobile and web applications with dashboard views, image capturing and other essential functionalities under the user-friendly view of design. The system has tested thoroughly under different conditions and evaluated by evaluators in different domains. Eventually, the test results attested that the analysis, design, implementation and documentation have been carried out effectively and efficiently.

Subject Descriptors: Garbage Classification, Garbage Detection, Quantitative Analysis, Deep Learning/Deep Neural Networks, Convolutional Neural Networks

Key Words: Garbage, Detection, Classification, Quantity, Features