Project Proposal

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Garbage Classifier

Environmental protection is a major concern in 21st century. One of the main contributors to the pollution and contamination of the environment is insufficiency in waste management systems. Implementing an effective waste management infrastructure can help us clean up our environment and preserve it for future generations.

Waste management starts from the time that the object makes it to disposal. Therefore, separating waste into proper categories is a crucial ~~point~~ *Part* in the overall waste management infrastructure. The main motivation of this project is to help categorize disposed items. Finding the right garbage bin for a specific object can be challenging and learning where each object should be placed can be time consuming. Therefore, this project aims to develop an application that helps us classify the correct bin for a given object. In order to benefit from this application, new set of hardware devices need to be added to the current garbage bins. The main job of the added hardware is to capture an image of the object and feed the image to this application. Afterwards, the application classifies the object and returns the id *Usually written as ID* corresponding to a garbage bin. The added hardware, after receiving the id of the identified bin, drops the object in the correct bin. This application is developed for three bin system, where there is one bin for recyclables, another bin for organics and one additional bin for non-recyclable garbage. Given the time constraint for this project, we will focus on classifying two items in each category. The items that are chosen consists of orange and banana in the organic category, drink cans and paper

All parts or just peels?

in the recyclable category and finally plice bags and light bulbs in the non-recyclable category.

The underlying classification mechanism will be a classical learning model that has been trained

on classifying the above specified objects. The specific classification model will be chosen after

trying several different classical algorithms, such Multi-Class SVM and Multi-Class Logistic

regression, and picking the best performing one for this specific problem domain. The

application will be implemented in python and will be using some of the available machine

learning and image processing libraries.

Any restriction on type (e.g. clear, shopping, etc)? Also, aren't bags recyclable in Toronto? Verify this.

You should provide a specific set and testing scheme.

Good background and problem set-up. More details are needed on your evaluation and final project form- do you intend to have a live demo, to gather your own representative test dataset, or some other final output form? Do you expect a specific camera/lighting setup?

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