

Automated Litter Verification API

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Background

Clean Planet Project Co. is a Colorado based 501(c)(3) nonprofit startup utilizing innovative solutions to make the planet a cleaner place. We are a fully remote and part-time team made up of passionate and fun individuals who are working together to implement creative solutions that make being eco-friendly more fun and accessible for all.

Our main project right now is the Litter CleanUp app. Litter CleanUp is a crowd-sourced trash cleanup platform that makes picking up litter fun. The app currently has over 350 users in 20+ different countries who have picked up 15,000+ pieces of litter. The app is built using Google's Flutter mobile app framework and Firebase platform. Learn more at <https://www.cleanplanetproject.org/>.

Project Description

A major part of the Litter CleanUp app is the approval of litter submissions. To keep our data accurate, we need to be certain that our user's submissions are truthful. Today this is a 100% manual process. Users submit groups of litter images with a picture of the trash can. We manually review these images to determine if the submission was truthful.

The goal of this project is to begin automating this process. The input to the litter verification API will be an image, timestamp, and latitude/longitude for each piece of litter and the trash can; not all of this information needs to be used in the classification process. For this project the classifier can simply label entire groups as "Valid" or "Invalid".

The students will be provided with our current dataset of verified and invalid litter images (20,000+ images), but may have to come up with a system to expand the dataset. Ideally the API will use Firebase Machine Learning and/or Google Cloud Platform for hosting.

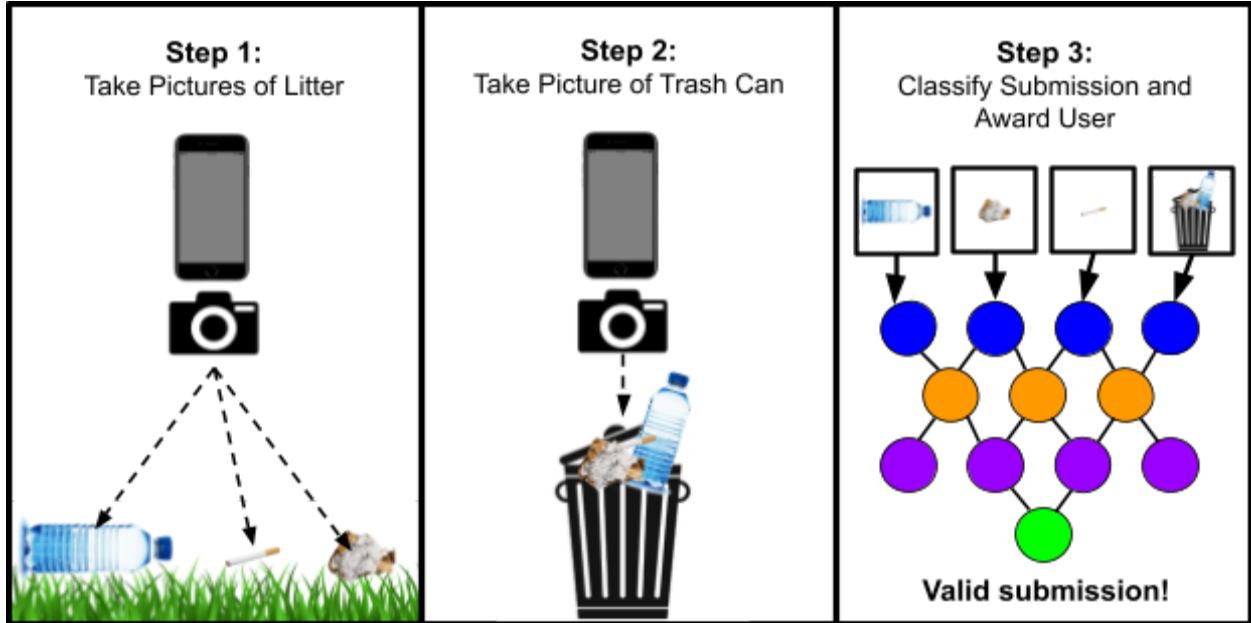


Figure 1: Graphic outlining the litter submission process. The user takes individual pictures of each piece of litter and then one picture throwing them all away. These images, timestamps, and lat/long coordinates become the input to the litter verification classifier.

Desired Skills

- Python
- Machine learning with computer vision (bonus for Tensorflow experience)
- Firebase (bonus for Firebase ML experience)
- Experience making web APIs
- Knowledge of Microservices Architecture

We are open to alternative programming languages and frameworks if necessary.

Team Size

We believe this project is suitable for a team of 3-5 students.

Internship Opportunities

Unfortunately we do not have the resources to offer full-time paid internships at this time. However, there may be opportunities for part-time contract work after this project.

Location

Fully remote. We do not have an office, but are currently located in the Denver area. We are more than happy to meet in person if necessary but can also do video calls.