

A decorative graphic on the left side of the slide featuring several green leaves of different sizes and shapes, some with detailed vein patterns, and three solid green circles of varying sizes. The leaves and circles are arranged in a stylized, organic pattern.

MEDICAL WASTE DISPOSAL USING GEO-TAGGED IMAGES

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Track:
Healthcare tech



INTRODUCTION

The project will include Geo Tracking of regions with high waste index detected using computer vision and Deep Learning image classification algorithms with help of geo tagged images captured by security cameras in every room on every floor of the hospital coupled with development of business models for collection and utilization of single use plastics and various other medical wastes. Due to inefficient waste disposal practices engaged in by hospital staff, it becomes a tough task for sanitation workers to determine which areas require attention and waste pickup. The current system in place is manual in nature and thus leaves room for human errors. With the security camera connectivity and intelligent algorithms, detection of such waste left behind can be done through image processing for every area.

Using this detection technique, areas that require help can be located. Furthermore, an algorithm is developed to use inputs such as single use plastic item sale, date of sale, time of sale and location of sale and provide output with a probable area in heat-map form that will show the most likely position of the disposed item. This data is displayed in a very simplified and readable form so as to enable authorities to plan further activities of waste management rapidly.

CHALLENGES IN EXISTING SYSTEM AND PURPOSE OF PROPOSED SYSTEM

- The current system has not been automated and thus lacks efficiency.
- There is no authority to keep an eye on the officials in charge of cleanliness.
- The proposed system will increase efficiency exponentially as well as serve as a checkpoint to ensure the officials are actually working.
- The current system is manual and displays lethargy. Automating it will ensure cleanliness and also promote a sense of accountability.





PROBLEM STATEMENT

Developing a learning model to aid in medical waste detection, collection and disposal in the form of an web application.

Goals

The goal of this project is to ensure complete sanitation in hospitals and medical dispensaries.

Objectives

- To increase efficiency of waste management in medical institutions.
- To increase awareness about the spread of infection due to inefficient disposal of toxic medical waste.
- To develop a system which detects and rates the cleanliness of any area by taking inputs of the area in form of captured images and give output rapidly.
- To make waste management task easier for the authorities.





METHODOLOGY

Geo-Spatial Local Classification scheme (LCS)

REGION DIVISION

Each region is divided into smaller areas and smaller subregions are formed and for each subregion different CNN models are trained with tuning them according to the specific region.

TRAINING MODELS

Locally trained models are generated and then these models are used to create a structure in which each geotagged image is redirected to a specific geotagged model. Optimally, we can create locally trained models for each locality using Grid or Quadtree. Each Locally trained model is made using CNN GoogleNet which has Least error rate of 43% compared to AlexNet and BerkleyNet.

VISUALIZATION

Once the system is trained and tested with maximum accuracy the detected levels of cleanliness can then be used further to map the hotspots of cleanliness on the map by using basic visualization techniques. These hotspots can be used to trigger the authorities about localities with high waste index. So once the user uploads a geotagged image, with the help of that image the area will get classified into cleanliness level.

APPLICATIONS

Applications of this project are very diverse as the cleanliness monitor can be trained for any area and this process of determining cleanliness can be applied worldwide.

The Best Applications of This System are:

- Medical Waste Management.
- Waste Detection.
- Classification of most unclean Areas and creating a heat map of localities according to cleanliness.
- Locality Study.
- Scientific Research.
- Study of Quality of population relating the cleanliness of localities.
- Environment study.



Expected Result

Project Expectations

The project is expected to be implemented by local hospital sanitation authorities. Due to implementation, maintaining the cleanliness of the hospital will become rapid. Also the data produced by the project can be used for further research work

Environment Impact

Infections spread due to inefficient disposal of toxic medical waste shall come to an end.

A positive and rapid effect in the betterment of the environment is expected.



Tech Stack

- ReactJs
- NodeJS
- Flask
- Python, JS
- Mapbox GL
- CNN (waste detection and waste classification)
- MySQL

Thank you!

ANY QUESTIONS?

