Intelligent system for removing visual pollution

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Project Overview

The purpose of the project is to facilitate the research procedures for observers and specialists in visual pollution. Artificial intelligence, computer vision, and neural network technologies were used to assist officials in making decisions to remove visual pollution. The machine was trained with a set of visual pollution data, classified and then predicted. The **EfficientNet-B0** algorithm was used, and it is considered one of the fastest algorithms that have achieved high accuracy in recent scientific research. The data was a set of images related to visual pollution, and it was taken into account in the training for **horizontal and vertical** imaging, and that the machine is trained on regular photography and drone photography, in addition to the training was done for the images according to the time of day and night and according to the weather condition **(clouds, rain, dust , sunny)** so that the machine is trained according to the type of camera, meaning that the camera is not required to have high specifications

Challenges In Preparing The Data

Unavailability of dataset the beginning of the competition

Dataset was used from a variety of sources:

- Kaggle.com
- Photos from Flickr.com
- Pictures from Google searches
- my own photography
- Dataset provided by the contest.

Expandability Of Work

Develop a strategy that helps make the system smart and integrated without human intervention.

Training the machine in monitoring mobile refrigerators during the Hajj season.

Training the machine in detecting fire

Possibility to use the program with:

- Surveillance Cameras.
- Drones.
- Mobile camera.

Training the machine in rationing the entry of trucks.

Training the machine to search for problems through social media platforms.

Training the machine for more visual pollution cases such as:

- Damaged cars.
- Food truck.
- Violating billboards.
- Umbrellas and hangers.

Training the machine in Crowd management.

Electronic connection with:

- Internet of Things systems.
- Asset management systems.
- Complaints systems (940).
- E-Ticketing systems.
- GIS systems.

Open Source Software That Was Used For Work

—Google Colab.

I Want To Try If I Have More Time/Resources/Data To Solve The Problem.

The Time

Using the algorithm and its work in an integrated system.
Improving the algorithm and adding the YOLO algorithm to make the video detection better.

Resource Possibility

Adoption of the idea by investors and building the system for the algorithm and activating.

Data to Solve the Problem

Increasing the data, as the current images of activating the algorithm reached more than 35 thousand images of visual pollution manifestations, and the more images and data, the greater the percentage of prediction and experience of the machine.

Detection Result

```
predict("./test_image/" + test_list[9])
```

Pred: broken signage


```
[ ] predict("./test_image/" + test_list[10])
```

Pred: construction road

```
predict("./test_image/" + test_list[4])
```

Pred: sand on road

```
predict("./test_image/" + test_list[5])
```

Pred: graffiti

Detection Result

```
predict("./test_image/" + test_list[6])
```

```
Pred: bad billboard
```

```
predict("./test_image/" + test_list[7])
```

```
Pred: garbage
```

```
[ ]  predict("./test_image/" + test_list[8])
     Pred: unkept facade
```

```
[ ]  Pred: bad streetlight
```

```
[ ]  predict("./test_image/" + test_list[1])
     Pred: faded signage
```

```
predict("./test_image/" + test_list[2])
```

```
Pred: clutter sidewalk
```

```
predict("./test_image/" + test_list[3])
```

```
Pred: potholes
```

Thank you!

Do you have any questions?

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