Real time people detection

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Overview

In this project we are going to identify the people present in the location via images, videos and live video through computer vision and machine learning techniques.

Libraries used

We are going to use opencv, numpy and TensorFlow.

Walk-through

We are going to use opencv for processing frame by frame to the model which was created using Convolutional neural networks with the help of tensorflow. We are dividing image into 19*19 cells. Each cell predicts the **bounding box** and confidence.

If the center of an object is in a grid it will predict the object using the weights trained by the neural network.

Even this has lower efficiency as there is confusion between exact centre of image and multiple cells predict the same image.

So Apart from the bounding box regression algorithm we will be using **non-max suppression** to avoid multiple detections of single objects. We will be using **IOU** (intersection over union) technique to detect the correct bounding box and eliminate duplicates corresponding to this particular object.

We define 5 **anchor boxes** of different shapes so that for each cell can now find 5 different objects instead of one.We will implement this by increasing the size of output of the model.

Apart from this:

We are going to use this prediction to monitor whether **social distancing** norms are violated by people .

We will be building a **django website** where any user can upload a file(Image or Video) and get the predicted output.

This website helps in taking realtime data and instantly provide the

Things outside the course :

Opencv and tensorflow are learnt outside the course for Convolutional neural networks and computer vision.

In the 2nd week we will first focus on giving real time input and using opencv to process frames. Then we will use IOU technique to build non max suppression and use anchor boxes to predict multiple images. Then we will work on post processing works like predicting the crowd,social distancing and editing the input data for the creation of output.

Resources: https://www.tensorflow.org/learn

motivations

I. Crowd detection

In recent times of pandemic it is difficult to monitor social distancing of people. So we can set a threshold of people in most active zones and send warnings appropriately. It can also be used to open or close gates to a place depending on the density of the people in that area..