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POTHOLE REPORTING APP THAT CALCULATES POTHOLE DIMENSIONS AND GEO LOCATION

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INTRODUCTION:

One of the major problems in developing countries is maintenance of roads. Well maintained roads contribute a major portion to the country's economy. Identification of pavement distress such as potholes and humps not only helps drivers to avoid accidents or vehicle damages, but also helps authorities to maintain roads

Most developing countries have pothole filled roads mainly because they are unable to allocate adequate funds for road maintenance, absence of effective systems to monitor road surfaces also contributes to this otherwise preventable situation. A road surface monitoring system which helps to detect the damages on the surface before it gets worse can bring down the cost of road maintenance significantly.

However, most government funded road authorities in the developing countries are unable to afford such expensive systems.in order to deal with this problem we have come up with a low cost app which will aid localites in reporting their pothole grievances to concerned civic authorities and getting it repaired in time.

RELATED WORK:

Vibration-based methods generally use gradient variation from accelerometer data. Accelerometers have been employed for pothole detection, owing to their low cost and relatively simple detection algorithms. However, the accuracy of detection is lower than that achieved with other sensors such as cameras and lasers, because potholes are detected only when a vehicle’s wheels traverse a pothole.

Moreover, false detections can occur with vehicles pass over manhole covers and speed bumps. Nevertheless, vibration-based pothole detection is advantageous given its low cost and simple methodology despite its limitations. Many studies have been performed in an effort to increase the accuracy of vibration-based detection by designing advanced algorithms and combining other sensor data. Recently, smartphones have been proposed to support mobile sensing, but these methods have

the same problems as vibration-based methods.

Laser scanning offers outstanding detection performance, compared to other methods. This approach is able to collect extremely detailed road-surface information using a technique that employs reflected laser pulses to create precise digital models. Accurate 3D point clouds measure elevation in the surface, and this information is captured with the laser and then extracted by filtering the data for specific distress features by means of a grid-based processing approach. However, whereas laser scanning is highly precise, the equipment needed is expensive. Furthermore, this method cannot be applied over a wide area for fast pothole detection.

OUR APPROACH:

In a nutshell what our app propose to do is take image from user, run machine learning algorithms on it to get an estimate of size(length, breadth)of Pothole,and geo location of the Pothole. In order to calculate the size(length, breadth)of Pothole we use

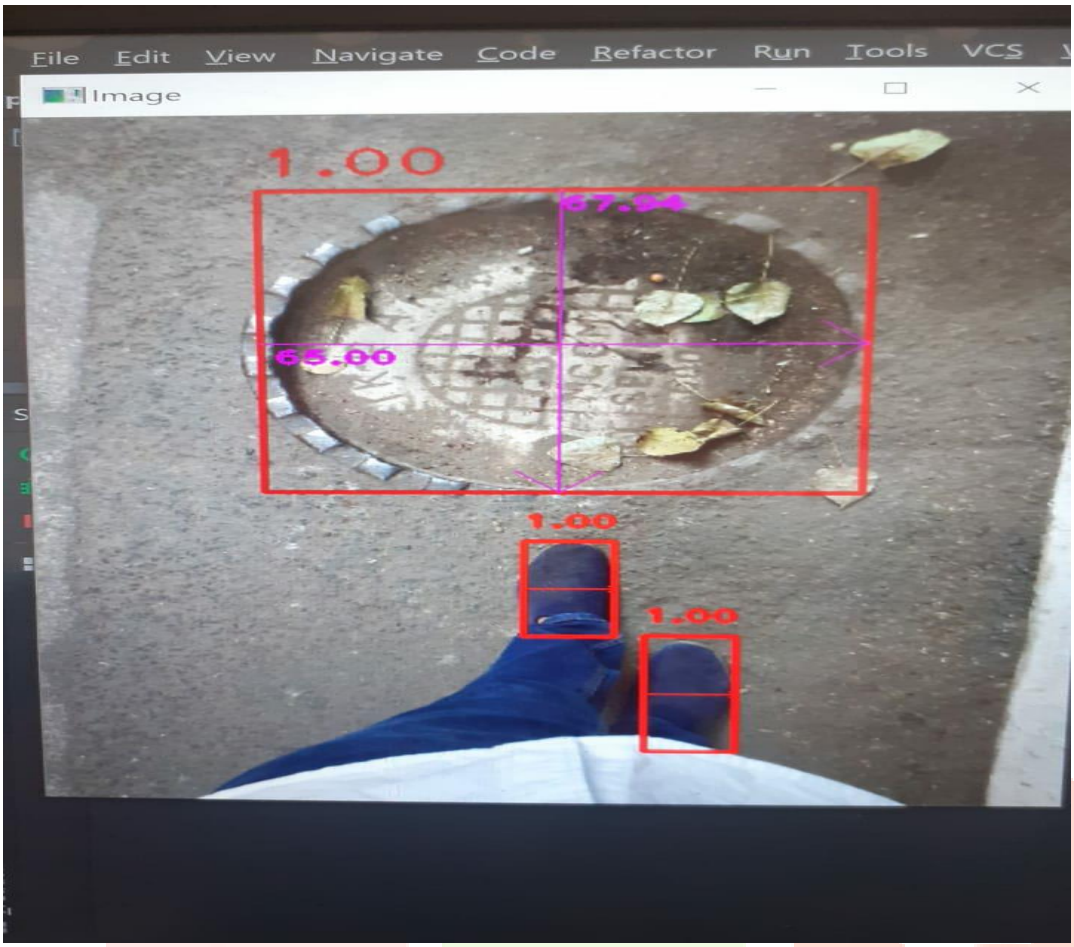
Foot of user as a benchmark and divide entire image into virtual tiles of same size and on that basis give an estimate of Pothole size.

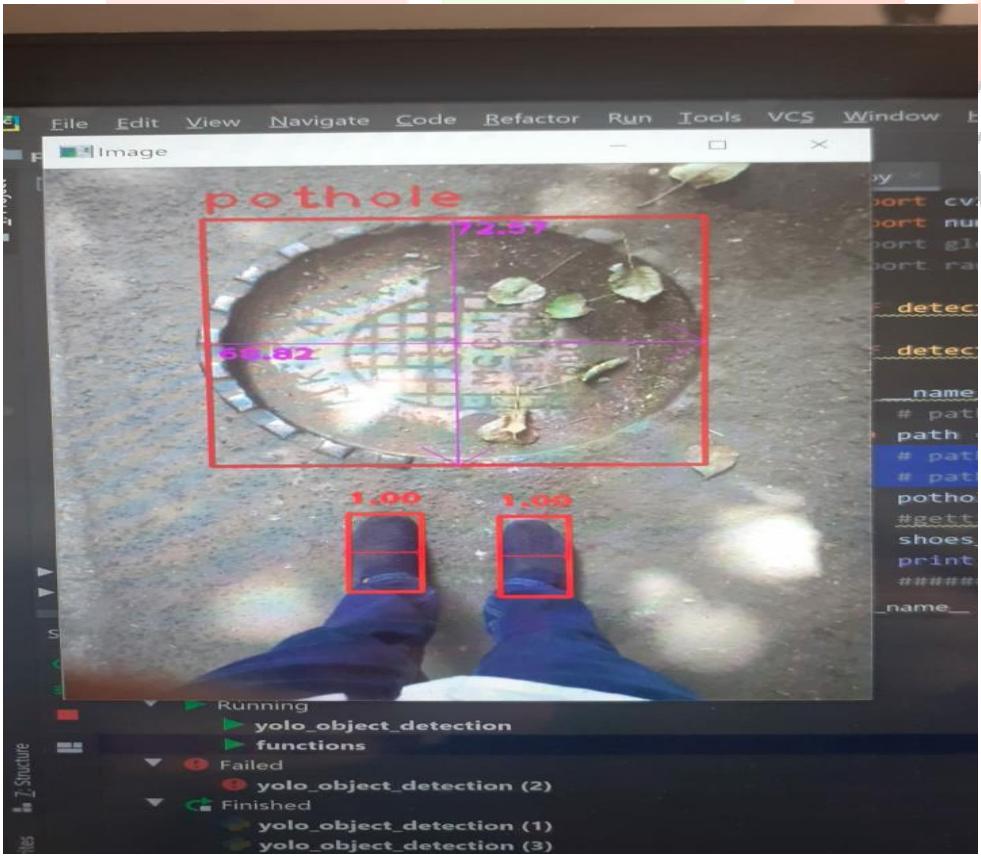
The benefit of this app is that it provides local authorities with the location and the severity of the potholes which they can repair and ultimately will result in a more safer and enjoyable driving experience.

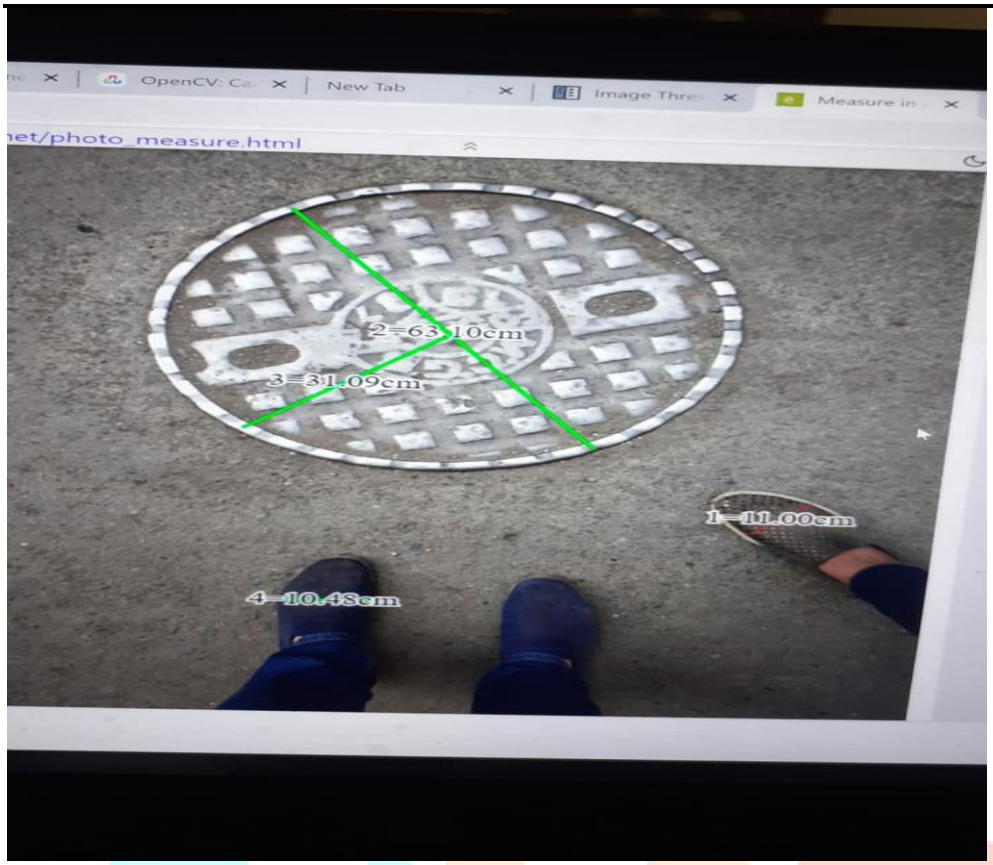
INSTRUCTIONS FOR UPLOADING IMAGE:

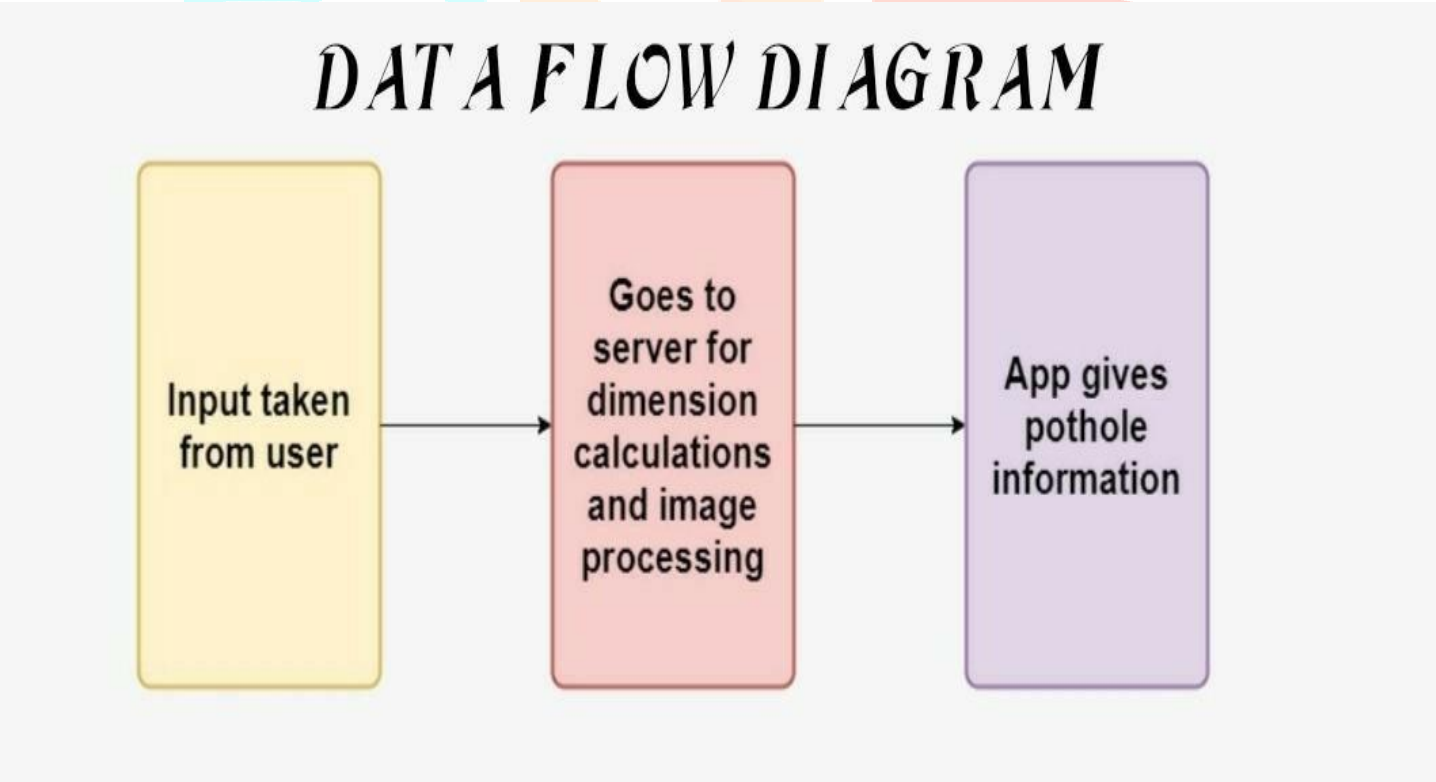
1. Kindly click the image of the pothole parallel from the ground
2. Image should contain atleast one foot of the uploader in the vertical position
3. Click the image from around your waist
4. Allow Location
5. Wait few secounds for location to load

MANUAL TRAINING









EVALUATION:

While evaluating accuracy we first physically measured Potholes and then compared it with the readings obtained from our machine learning algorithms

Most of the time we hit accuracy of 95% and above Following are the test samples:

Actual values(length*breadth)	Predicted values(length*breadth)
19*17	19.25*20.12
68*68	68.82*72.57
62*62	65.06*67.94
22*44	21.70*43.01
30*63	31.09*63.10
23*13.2	23.06*12.96
28.5*30.2	28.47*30.43
25.8*15	26.75*14.84
10*7.5	9.59*7.65
28.6*14.70	28.50*14.70
14*18.3	13.68*18.14
65.5*64	65.43*63.90
60.5*59.5	60.53*59.41

(source – latlong.net) Actual Values (Latitude Longitude)	Predictable Values (Latitude Longitude)
18.954260, 72.830350	18.953868, 72.830705
11.253208, 61.875423	11.253218, 61.875395

CONCLUSION:

The main goal of the project of pothole detection has been practically implemented. The prototype that is built is primitive there is always scope for future improvements

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