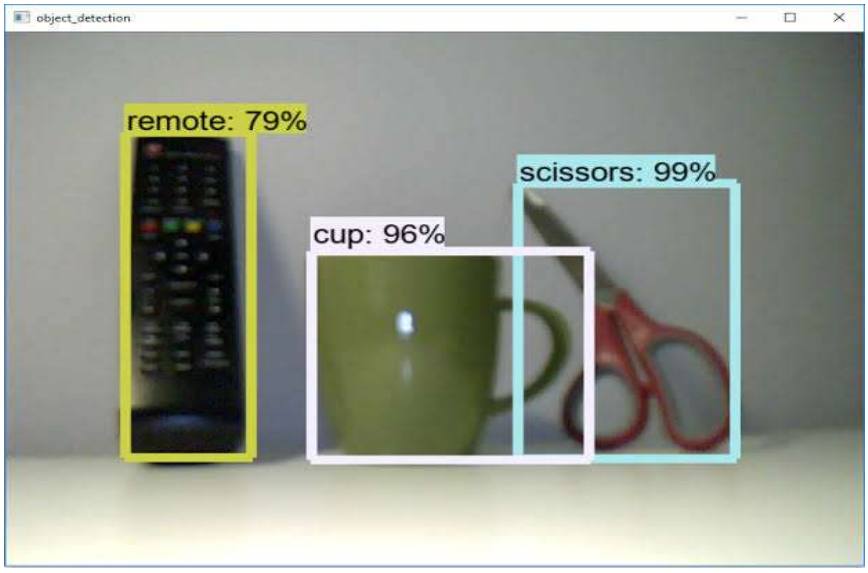
1. Research Background?

The R-CNN algorithm process the image into a bundle of boxes and checks if any of these boxes contain any object. The selective search methodology has been used by the fast R-CNN algorithm to extract these boxes from an image. The varying scales, colors, textures, and enclosure are the four regions that form an object. The selective search identifies the patterns in the image and based on those patterns they split the image into various regions. The first step is to capture the objects using the camera of the smartphone for this the application should get the camera permission of the device. Then the image is sub-segmented so that multiple regions can be formed from a single image. The algorithm then combines similar regions to form a larger region and finally produce the region of interest. The pre-trained convolutional neural network is trained again based on the number of classes that has to be detected then the region of interest is identified. Based on the region of interest, the objects and the backgrounds are classified. For each identified object in the image, tighter bounding boxes are generated based on the linear regression model.

2. Detailed Information of dataset with count of trained and tested images?



1. The dataset used for this project is YOLO V3 weights which are pre trained weights it consists of various test images and train images for object classification.

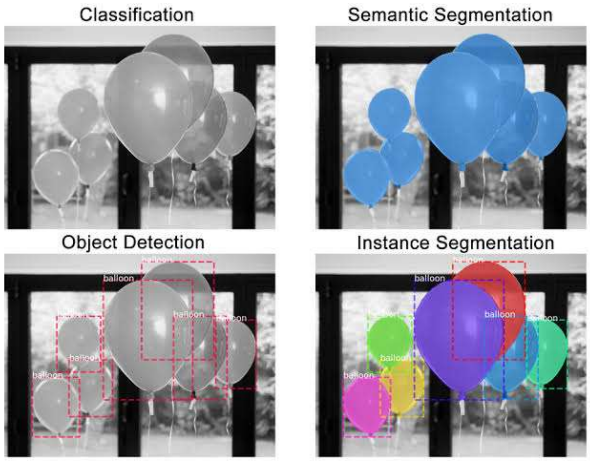
2. Each dataset which is used for training and testing images consists of about 10000 test images and 1 lakh trained images of objects.

3. Object classification takes place with maximum accuracy as as in the above pictures

Remote [79%], cup[96%],scissors[99%].

3. Mention the features to be extracted in the feature extraction process?

Feature Extraction



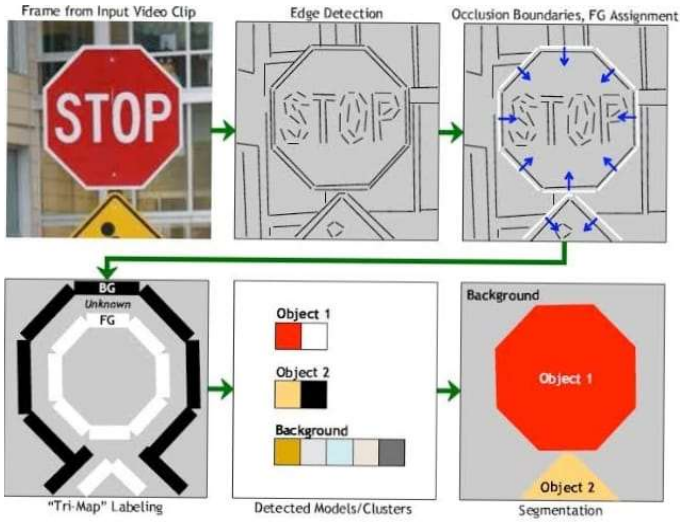
Feature extraction can be done by mainly 4 ways:

a. Classification.
b. Semantic Segmentation.
c. Object Detection.
d. Instance Segmentation.

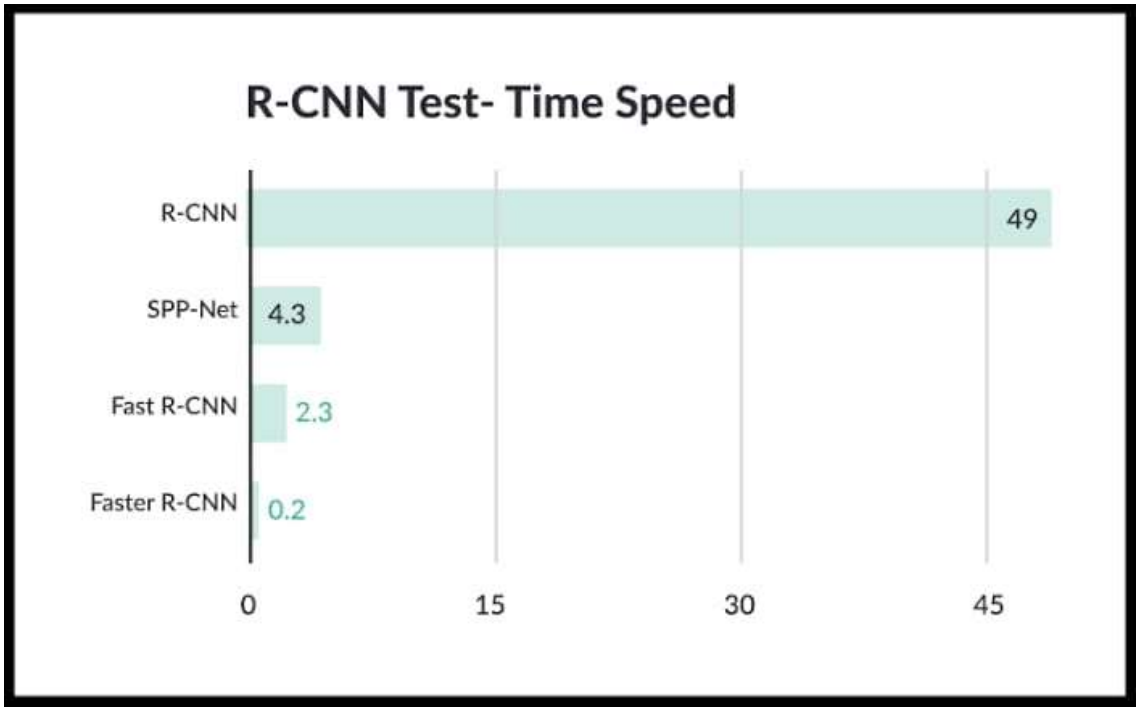
Object Detection takes place by creating bounding boxes over the image.

Edge Detection

Edge detection is an image processing technique for images. It works by detecting discontinuities in brightness. Edge detection is used for image segmentation and data extraction



ACCURACY SPEED

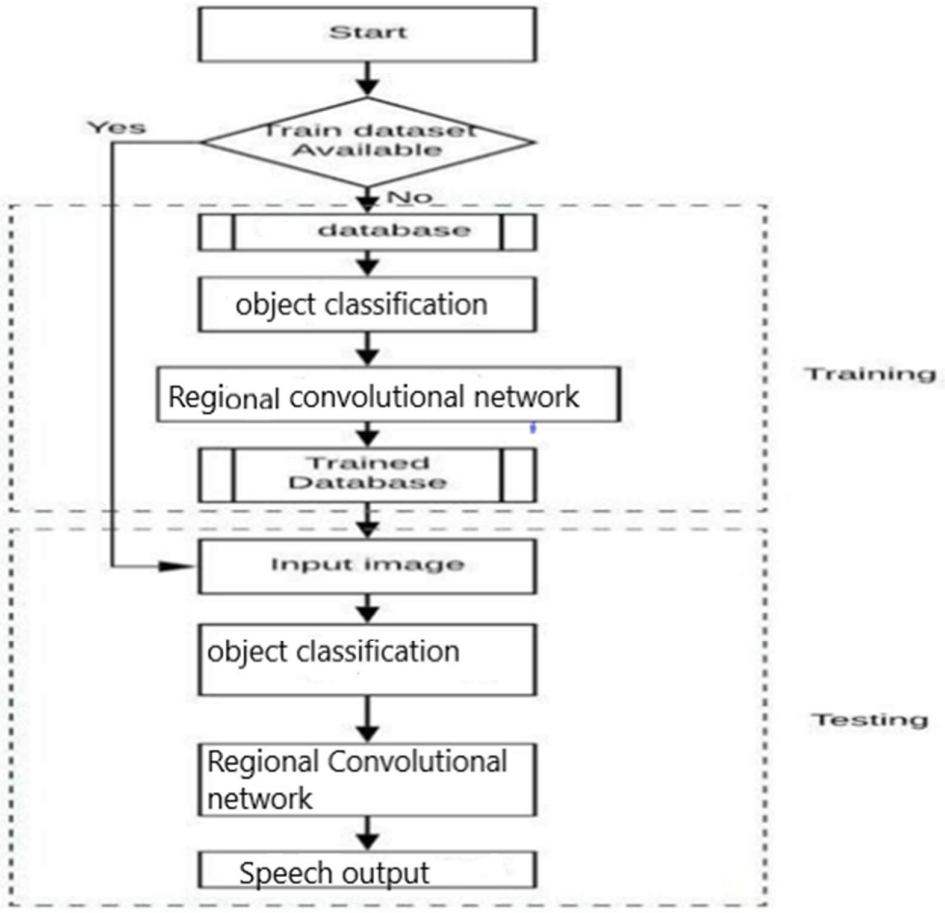


This is the accuracy time speed of the object

4. Proposed model work flow?

The supervised learning method used in most of the object recognition algorithms requires lots of computation time. It might also receive a wrong label during the classification. Hence we substitute supervised learning with reinforcement learning. In simple words, it can be defined as trial and error. It attempts to learn in order to get rewarded. At every training action, it tries to learn and give us the desired outcome. It is rewarded accordingly. Reinforcement learning has to goal to maximize its reward. So the training dataset given to it, it learns from it and performs the action to give us the output of an image. The reward functions are SR and NR which are positive and negative rewards respectively. Whenever the machine gets a negative reward, it learns the dataset again with a different approach. The next time when a similar input image is given the accuracy of output is improved.

In the proposed system, unlike ANN (Artificial Neural Networks), R-CNN (Regional Convolutional Neural Networks) algorithm to train the dataset.

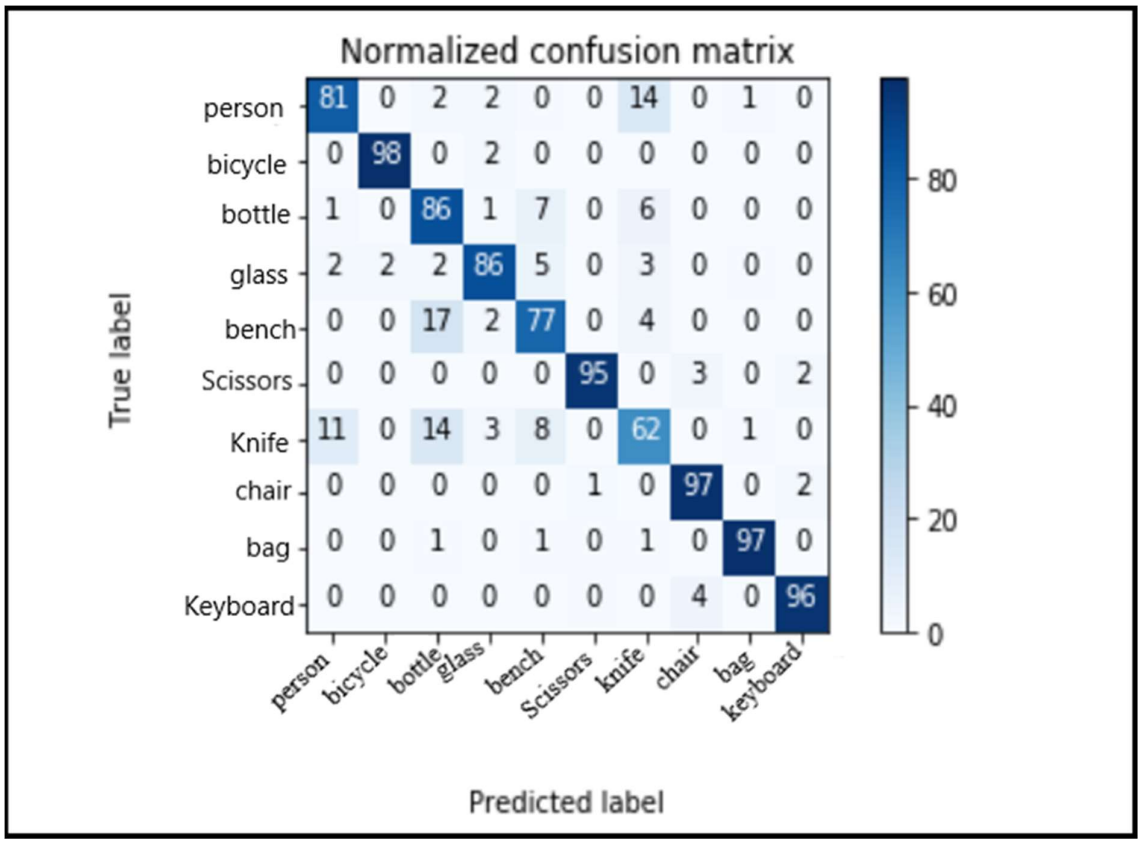


WORK FLOW OF PROPOSED MODE

5. **Performance matrix /Confusion matrix?**

CONFUSION MATRIX

Once the model has a trained dataset, then the input image are processed by the convolutional neural network. A confusion matrix for the model is created. This will evaluate the most confused human expression for our trained model.



The image processing time is higher when the image has a higher resolution. To reduce the dimensionality size of the image, the pooling layer in the neural network requires more time since the pixels in the image is more, it tries to retain the important information in the image.