**PCPS PROJECT – 2020-21**

**NAME OF THE PROJECT :** Object Recognition System

**TEAM NUMBER :** Batch 9 – C2

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**DATE :** 24th February, 2021

**OBJECT RECOGNITION SYSTEM**

An object recognition system is being created, which performs the task of identifying various objects in the source image and ranking them with a particular level of accuracy.

The system provides the users with a clean and easy to use Graphical User Interface (GUI), which allows them to do the following tasks :

1. Select an image from the local device (device in use) and upload it into the system for recognizing objects. The output includes the image, with each of the objects that are detected being labelled with their respective class names along with an accuracy percentage. (e.g. Dogs, Cars, etc.)
2. Use the device’s inbuilt camera and detect if there is an object present in front of the camera. The output is shown in real time.

Appropriate buttons, labels, windows and message boxes have been provided to make sure the user has a smooth experience.

The core functioning of the program involves the creation and use of a Convolutional Neural Network (CNN). The CNN created has an input layer, a series of hidden layers and an output layer. The hidden layers perform the task of convolution of tensors (multidimensional arrays created from images). A dataset (cifar-10) of images is used to train and test the model. The CNN is trained with 50,000 images of various classes for e.g. humans, dogs, etc. and is tested against 10,000 images, where the accuracy of the images are also tested. Libraries such as TensorFlow and OpenCV have been used to facilitate the code. Finally, the CNN is used to detect objects in the image provided to it. The SIFT function present in OpenCV is used for live object detection, that continuously captures images and checks if an object is present in the image.