

**CSCI 4734** | Machine Learning

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Initial Report

**Motivation**

Object recognition is defined as computer vision technique for identifying objects in images or videos. It is used as a key output for deep or machine learning algorithms. When human beings look at a picture or watch a video, they can readily detect people or objects or other visual details. The aim of object recognition to implement this ability to a computer in a way that it can digitally understand image and its details.

To implement object recognition utilizing a standard machine learning approach, beginning with a collection of images (or video) and choosing the applicable features in each image is required. For instance, a feature extraction algorithm might select edge or boundary features which may be helpful to differentiate between classes in data. Then in turn, these features are attached to a machine learning model, which will classify these features into their different categories, and then utilize this information when analyzing and classifying new objects.

Our aim of choosing this application is to implement this widely-used algorithm for local community purposes such that spotting violent behavior in a traffic or crowded place, ensuring proper quality control of parts in manufacturing and etc. The main feature of our application will be to fit it to our local circumstances and conditions such that applying Azerbaijani Language image detection would be helpful for local people.

**Method**

As a method for implementing our project, we used Tensorflow API that is the toolkit for building neural network. Firstly, Neural Network is trained with quite enough amount of data that will be collection of pictures of objects. In detail, the input and output will be given to the network in order to find the way for doing the task in a better way. Tensorflow API is an opensource framework and makes easier to build and test the detection models. We divided pictures into labels and start training with the help of deep learning. Pictures are divided into two parts: train and test part. Train will take pictures from labels and decide which class they belong.

**Intended experiments**

As mentioned above, Tensorflow is one of the important concepts of Machine and Deep Learning because of the job it does. Actually, there are several ways to do image and object recognition, but thanks to Google’s Tensorflow it’s way easier and more beneficial because of using sufficient CPU when it works.

The experiments we will try to do are the following:

1. Image and object recognition using the Tensorflow API
2. Checking all the imported dataset in Azerbaijani language
3. Adding the voices when the objects are found
4. Implementing the application on mobile phones

The main question is that how we can use the Tensorflow and implement it in the way that we want. For the image recognition, we need to add all the required images for our dataset that will be CSV mostly (we will add all the images and their labelled classification into the dataset). Tensorflow will try to find out what the image is and to which class it belongs. For the videos, we will be using OpenCV which is open source and used for real-time object recognition. In our final report we will be explaining OpenCV more. As mentioned above, the voice will also be added to the application for saying the exact object in the scene. Mostly, we will be using the mobile phone cameras for our real-time showcase for the project.