

Project Proposal

CS 577 – Spring 2020

Project Name: Driver's Distraction Detection using Deep Learning and Computer Vision

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MAIN REFERENCE PAPER:

Paper Name: Driver Distraction Detection using Deep Learning and Computer Vision

Authors: Kusuma.S, Divya Udayan.J, Aashay Sachdeva

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PROBLEM STATEMENT:

Automobile crashes have tremendously increased these days and first the foremost cause for motor vehicle accidents and incidents is Driver's distraction. Driving requires an intensive amount of concentration otherwise the results can be fatal. Yet, most motor vehicles have no system in place to assist the driver when he/she is feeling drowsy, fatigued or distracted. In this project we aim to develop a system which detects the driver's distraction by using deep learning and computer vision. Whenever the driver is not concentrating on the road the alarm alerts the driver. In this project, we are going to use deep learning techniques for estimating the position of the face, eyes as well as hands to help in the better detection and reduce false positives and negatives.

DATA:

Dataset: <https://www.kaggle.com/c/state-farm-distracted-driver-detection/data>

Here we are going to use the Statefarm dataset which contains snapshots from a video captured by a camera mounted in the car. Here the dataset has 22,400 training samples with equal distribution among the classes and 79,700 unlabeled test samples. There are 10 different classes of images which are stated below:

c0: safe driving

c1: texting - right

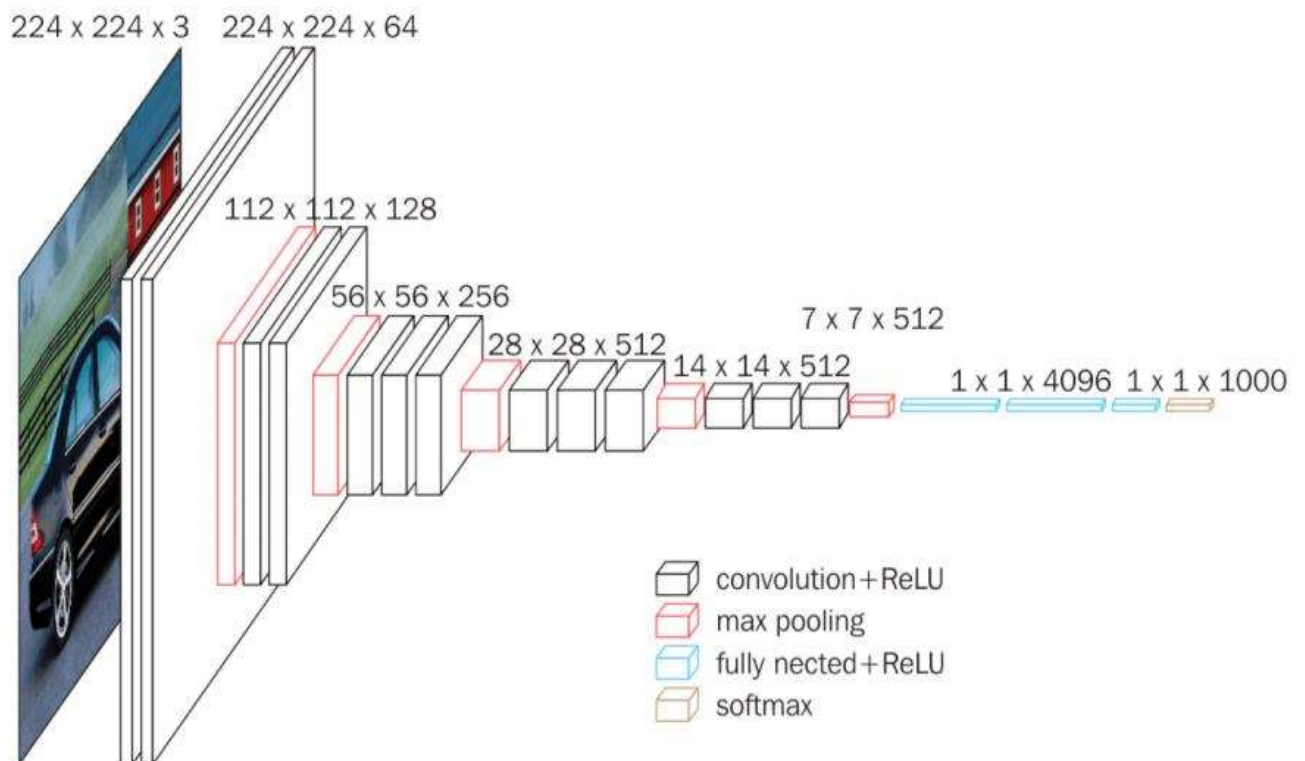
c2: talking on the phone - right

c3: texting - left

c4: talking on the phone - left
c5: operating the radio
c6: drinking
c7: reaching behind
c8: hair and makeup
c9: talking to a passenger

APPROACH

1. Image recognition can be done using a deep convolutional neural networks (CNN). CNN can be used to achieve good performance even on difficult image recognition tasks such as detection of face, eyes and hands.
2. We can train a neural network on top of an already existing or pre-trained network such as VGG-16 which is a 16-layer CNN used by the VGG team in the ILSVRC-2014 competition as it excels in Image based classification. The VGG-16 model architecture is as follows:



REFERENCES:

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