INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact Factor: 6.078

(Volume 8, Issue 3 - V8I3-1335)
Available online at: https://www.ijariit.com

Accident detection system

Manideep Pallerla
pallerlamanideep10@gmail.com
Gandhi Institute of Technology and Management, Visakhapatnam, Andhra Pradesh

Anusha Nallamalla
anallama@gitam.edu
Gandhi Institute of Technology and Management, Visakhapatnam, Andhra Pradesh

ABSTRACT

In this project, we detect the accident between two vehicles. For the purpose of the detection, we use certain algorithms such as YOLO and CNN (Convolutionary Neural Networks). This project is mainly built upon the combination of Object Detection and Tracking System (which is also abbreviated as ODTS) and RCNN algorithms which are mainly used for detecting purposes. In this project, a video is given as input where the coded algorithm completely separates the video into frames and analyzes the-each frame and detects the crash in the frames and gives those frames as an output. In addition to the accident detection, YOLO also detects the surroundings such as, person, car, truck etc. The main point of using YOLO is to detect the surrounding and the crash (with the help of CNN).

Keywords: *YOLO, RCNN, OPENCV, CNN, ODTS, WWD Analysis.*

1. INTRODUCTION

The system detects and classifies vehicle accidents with the help of CNN which is based on deep networks and also uses yolo. Reports the essential information about the accident to emergency services providers (in case if this project is extended to IOT for an alerting system). The system consists of a various ml and python modules, YOLO. The proposed system works for the accident detection. This system is mainly used as fast response for the emergency providers so that no life is in danger. But this can be developed such as providing medication to the victims at the accident spot. This system can be attached to an IOT alerting system for better improvement. The main objectives of this project is as follows according to the modules used in the project,

–Tracking the accident through frame separation.
– Analysing the frames of the video and filtering the crash frames from the video or cc tv.
– Giving hough transform and edge detection in case of dark video without night view camera output.

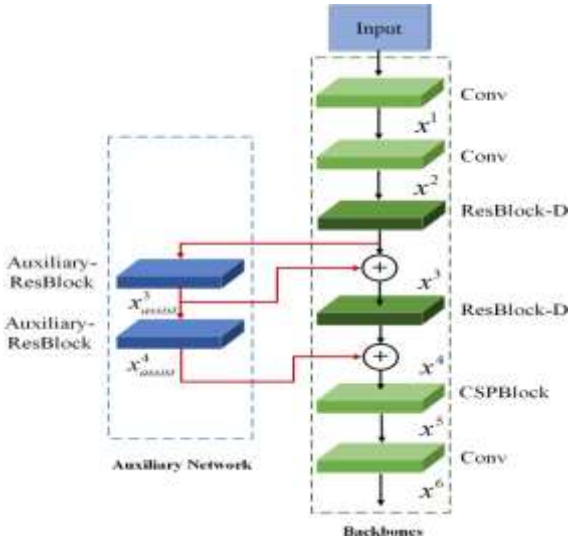
2. METHODOLOGY

Here the methodology is a kind of a process that is done internally to get the output. We have YOLO and CNN algorithms as present in the methodology.

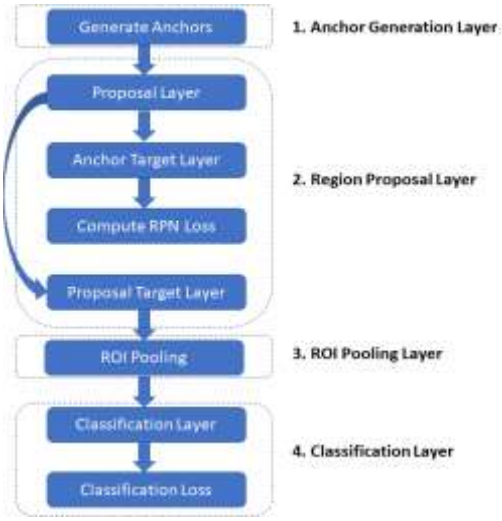
YOLO:

we review object detection as a linear regression problem. A single CNN parallelly predicts multiple bounded boxes and class probabilities for the given boxes. YOLO actually trains on full length or full-sized images and directly solves detection performance. This model has many benefits over normal methods of object detection. Primarily YOLO is very fast, since we discuss frame detection as a regression problem, the pipeline can be avoided. we just run our network on a new image at the time of testing to predict detections.

YOLO always learns generally representation or detection of objects. when it is trained on the images which are natural and tested on the artwork, YOLO is the kind that performs outstandingly compared to top detection methods like DPM and R-CNN with a high margin.



R-CNN:
The model of R-CNN firstly selects several regions which are proposed from an image or a picture, and then they are labelled with their categories After the process they use an algorithm called CNN (Convolutionary Neural Network) to perform forward computation to extract features from each proposed area. then, we use those features of each area or each region to predict their respective categories. Based on the object information which is detected, an dependent object tracking module will be started to assign an unique number to each of the objects that are detected.

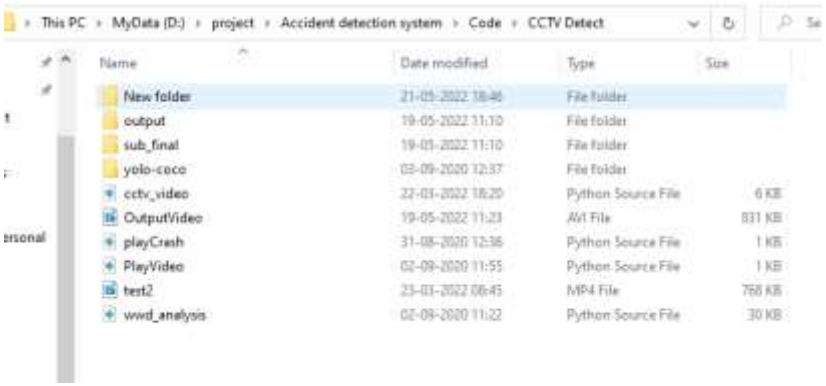


3. MODELLING AND ANALYSIS

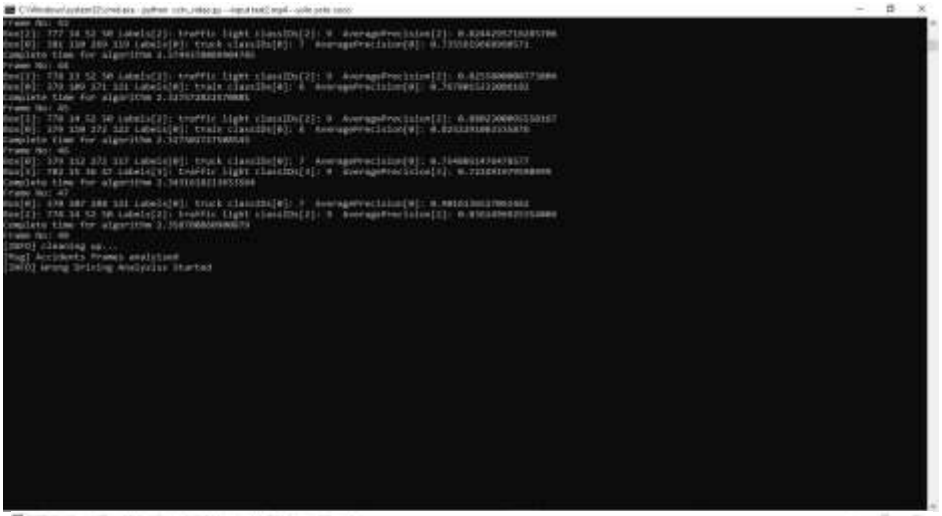
Here in this section, we will see the coding part but not the programs, for the complete clean execution, we need to install all the modules required such as: Numpy. Argparse, CV2, Imutils, Subprocess, etc. Not only the modules, but also needed to download a file which consists of object detection and tracking system called YOLO (You Only Look Once) and also the coco file which needs the support.

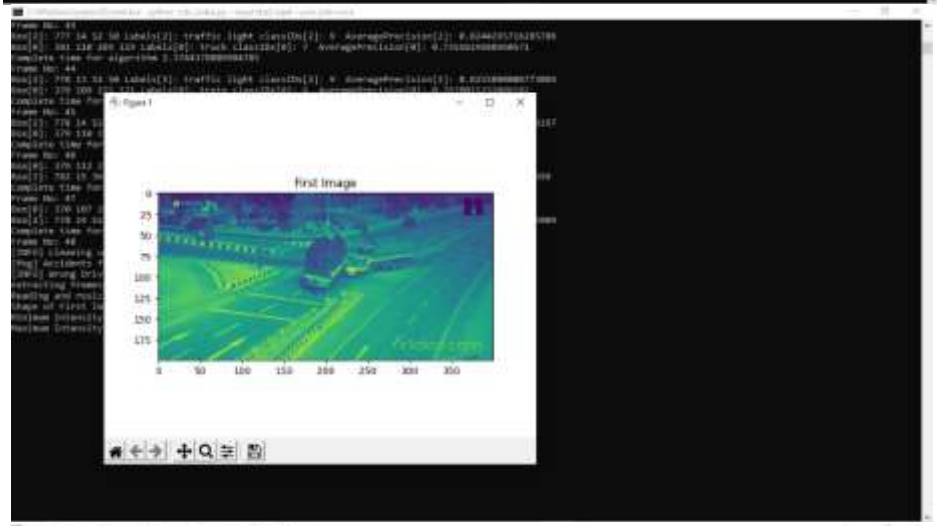
In the process of execution, we find more than one coding file because, one is the main file and others are named as
Playcrash.py
Playvideo.py
Wwd analysis (wrong way driving)
When the video is given as an input to the model, it separates the frames and analyzes the, each frame with the help of YOLO and RCNN algorithms.

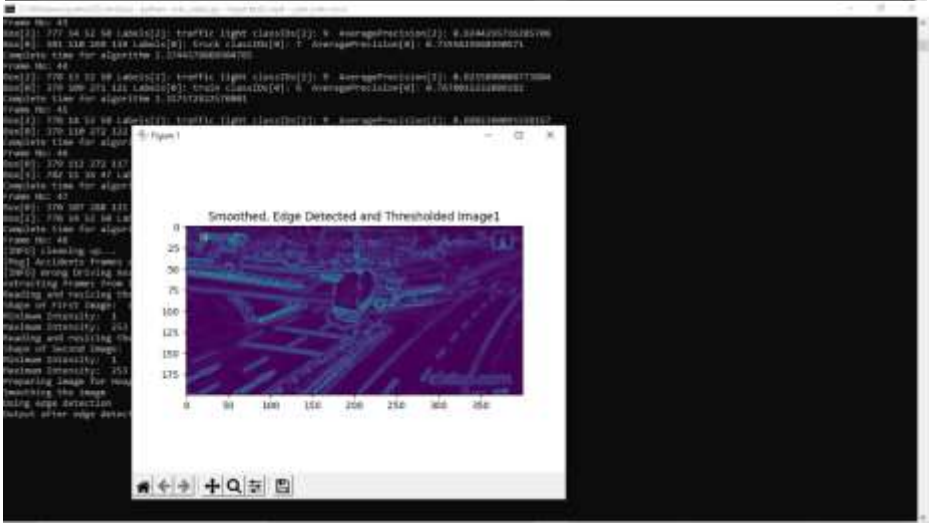
- Finally, after completion the detected crash frames are played with the help of the file in which PlayCrash code has been written, similarly the video is shortened to just the crash point and again played with the help of the code which is written in the file playvideo.
- Here we have two outputs based on the algorithms, the yolo based algorithm is saved in the output video file which is originally an AVI file, this file shows the same video with the object detection.
- The next is the output based on the RCNN algorithm, this out is stored in the output folder in the form of frames including the crash detected frames.

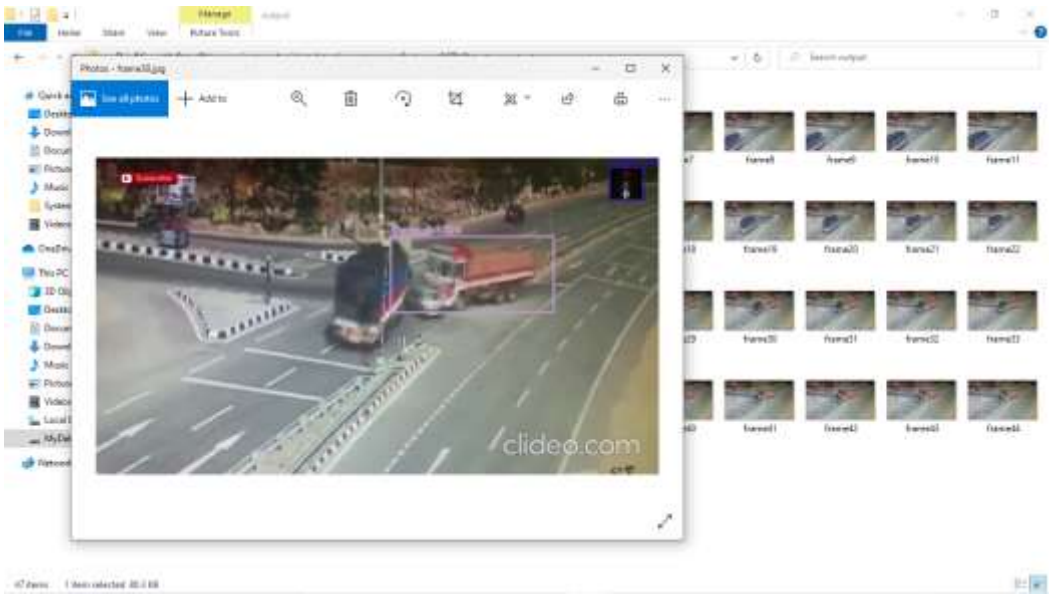


4. RESULTS









5. CONCLUSION

Here we can conclude that, by the above project we can detect the accident by the means of cc-tv camera footage, therefore we can say that the model that has been built using YOLO and Open-cv are time taking process but very much accurate in terms of results. As the work of the tensor flow and the module YOLO is same as the other but the only difference is the accuracy and the system compatibility, YOLO is can be run on the single CPU but where-as tensor flow compulsorily needs the GPU system for the execution (normal system execution). These projects can't be executed on the online laboratories as they are completely virtual.

6. REFERENCES

[1] Guanqing Li, Zhiyong Song, Qiang Fu, A New Method of Object Detection for Small Datasets Under the Framework of YOLO Network, 2018 IEEEE 3rd Advance Information Technology, Electronic and Automation Conference (IAEAC 2018)

[2] Joseph Redmon, Santosh Divvala , Ross Girshich, Ali Farhadi, University of Washington, You only look once: Unified Real-time Object Detection,2016.

[3] Shristi Sonal and Saumya Suman, A Framework for Analysis Of Road Accidents, 2018 International Conference of Emerging Trends And Innovations in Engineering And Technological Research (ICETIETR).

BIBLIOGRAPHY

Manideep Pallerla
Gandhi Institute of Technology and Management, Visakhapatnam, Andhra Pradesh, India

Anusha Nallamalla
Gandhi Institute of Technology and Management, Visakhapatnam, Andhra Pradesh, India

