

# Car Accident Detection Using Deep Learning

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## ABSTRACT :

Around 1.25 million people die each year in road crashes, with an average of 3.287 deaths per day. Road traffic accidents rank as the 9 leading cause of death and account for 2.2% of all deaths globally. Objects detection has become one of the most important aspects considered in the detection of car accidents and it has massive possibilities to be applied in general with machine learning and in particular with deep learning. The main reason for doing this study is that people die on the highways and in a low traffic area as there is no one to notify the ambulance about the accident. This paper describes an effective way to solve this problem using a deep learning algorithm to detect car accidents and then sends notifications to the relevant authorities, such as the police, ambulance, firefighters stations. The data is collected through CCTVs that pointed to the streets and from the traffic signal cameras. Using a deep learning algorithm the accuracy achieved for a car accident detection using the CNN model is more than 90%. The delay of relevant authorities to arrive may cause great harm and sometimes may cause deaths. Therefore, it is hoped that this particular problem will be solved based on deep learning algorithms and methods.

## TOOLS :

The programming language used is Python alongside with many libraries such as TensorFlow, Keras, OpenCV, NumPy, Pandas, and Matplotlib. The model is being trained by using Google Cloud Computing service with Ubuntu as an operating system.



## PROBLEM STATEMENT :

The load of traffic accidents in both death-rate and morbidity is sharply increasing in the developing countries. That is all because of the economic growth which is meant to be the rapid reason for increasing the number of vehicles sold per year. Car crashes now responsible for 1.25 million deaths of people.

## OBJECTIVES :

- 1- To develop an algorithm that detects images of car accidents in real-time (within one minute).
- 2- To alarm the relevant authorities (Police and Ambulance) of car accidents using (Global System for Mobile (GSM)).
- 3- To use GPS (Global Positioning System) to send the location of the car accident.
- 4- To test and improve the performance of the system.

## SIGNIFICANCE :

Arriving at the relevant authorities of car accidents to the location of the accident, in order to help and save them from death or serious injuries before it is too late.

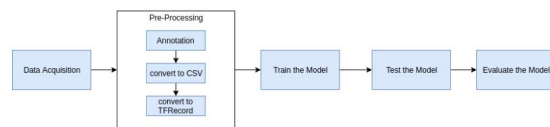
## ORIGINALITY :

- 1- This research main aim is to reduce the toll of death waiting for the relevant authority to come to the accident location.
- 2- This research targets to develop a car accident detection algorithm and warning the relevant authorities immediately when the accident happens.
- 3- This research has its own dataset.

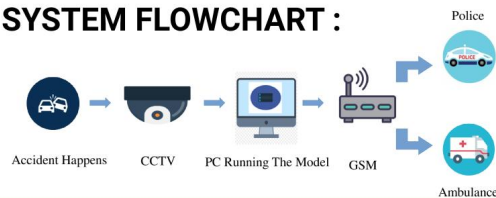
## METHODOLOGY :

In order to get a model with a satisfying result, steps of data manipulation and an environment with powerful computational resources and a dataset is setup.

## PROJECT WORKFLOW :



## SYSTEM FLOWCHART :



## DATASET :

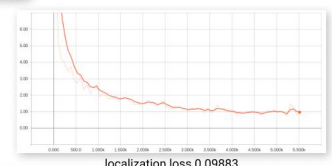
The dataset is a manual collection of images containing cars accident, contained 556 images of different sizes, collected from 66 videos available on YouTube. There is one class which is (accident).

## RESULTS :

After 5298 steps the model being able to detect and identify car accidents with classification loss 0.237 and localization loss 0.09883.



Car accident detected



KICT FYP SHOWCASE  
SEM I, 2019/2020

FYP 2  
BCS