A Project Report

on

Crash Detection System

Submitted in partial fulfillment of the requirement for the award of the degree of

School of Computer Science and Engineering

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ABSTRACT

Number of road accidents are directly proportional to the number of vehicles on the road i.e number of people. There are no proper systems in India that are used /integrated with road safety measures. In many scenarios, by the time help reaches the victim something serious could happen to them. Our project aims to minimize this time of action. With the help of python, open CV, TensorFlow, etc. we can detect the accident, and by integrating this technology in the surveillance cameras already available on the road we can notify the concerned authorities.

The problem faced is that people dont get help on time when they meets with an accident. This might would happen because of lack of information provided to cencerned authorities, or no information provided at all so they might will not be able to take any action or will be late.

Available technologies are not efficient enough or are insufficient for the large population, some examples of available technologies are IOT sensors embedded in cars which sends distress messages to emergency contacts, they are not efficient as the vehicle might be at a place where there is no network/signal and for this to work all the vehicles has to be modified accordingly and furthermore not all vehicles can be modified.

Considering these limitaions comes our solution i.e embedding new technologies in already available technologies. With the help of python, open CV, TensorFlow, etc. we can detect the accident, and by integrating this technology in the surveillance cameras already available on the road we can notify the concerned authorities.

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Acronyms

B.Tech	Bachelor of Technology
M.Tech	Master of Technology
BCA	Bachelor of Computer Applications
MCA	Master of Computer Applications
B.Sc. (CS)	Bachelor of Science in Computer Science
M.Sc. (CS)	Master of Science in Computer Science
SCSE	School of Computing Science and Engineering

CHAPTER 1
INTRODUCTION

In our country road accidents square measure a negative external development related to the growth of road connections, traffic and concrete migration within the country. a serious public ill health is road injuries, resulting in loss of life and chronic suffering within the victim's family leading to incapacity and hospitalization. within the case of Bharat, road injuries square measure the leading explanation for death and loss of health for individuals aged 15-29. within the 2016 twelvemonth, the full variety of road accidents rumored was four,80,652 inflicting injuries to four,94,624 individuals and one,50,785 deaths within the country. and their variety is increasing by regarding 100 percent per annum. Rail and coastal shipping accounts for regarding thirty two % and seven %, severally, whereas the share of internal water and traffic routes is a smaller amount than hundredth every. Trains square measure an inexpensive means that of transportation and square measure accustomed transport massive quantities of products over long distances.

We have long proverbial that the road safety scenario in Bharat isn't unhealthy, to mention the smallest amount. return to consider it, the atrocious state of affairs within the state of road safety in Bharat has continually been seen by the globe. And currently we've got another reminder of however dangerous roads square measure - now from the globe Bank. Yep, the globe Bank has simply been free a replacement report that produces some attention-grabbing notes regarding Bharat. First, the report notes that though Bharat is home to only 1 % of the world's vehicles, it still accounts for eleven % of the world's deaths in road accidents. this is often terribly high within the world, by the way. It provides a good worse number: fifty three road accidents occur in Bharat often, killing one person each four minutes. The 2019 International Bank for Reconstruction and Development report, Guide to Road Safety Opportunities and Challenges: Profiles of Low- and Medium Leading Countries, intercalary that thirteen hundred thousand individuals were killed and another fifty hundred thousand individuals were disabled on Indian roads over the past decade. Wait, there's additional - this report, which has the under-reporting and crash statistics of the Department of Transport and Highways, estimates that accidents have price the country a big quantity. Road accidents in India: the value we tend to pay Interestingly, the report states that the automotive accident and major harm prices of 2016 stood at seven.5 % of India's gross domestic product or nine twelve.9 hundred thousand large integer. this is often over double the worth obligatory by the Indian government - i.e. three % of gross domestic product or ₹ four.3 hundred thousand large integer. in person speaking, road accident injuries and deaths result in monetary stress and push poor households into financial condition and people already in debt. Nitin Gadkari, Minister of Trade Unions for Roads and Highways, recently delineated the state of road accidents in Bharat as "more dangerous than the COVID-19 epidemic". He additionally intercalary that preventing death and reducing injuries throughout road accidents will have vital monetary advantages yet. Gadkari aforementioned the calculable price of death in a very road accident was regarding .1 91.16 lakh.

Our project will work as an extension to available hardware and will ensure that help reaches to the victim in time. This will save many lives and other losses that could be done.

TOOLS/TECHNOLOGIES USED	DISCRIPTION
Python	Python is AN understood, object-oriented, high-level artificial language with dynamic linguistics.
OpenCV	OpenCV is AN open supply laptop vision and machine learning package library
TensorFlow :	TensorFlow is AN open supply package library for numerical computation victimization data-flow graphs.
Pytorch	It is an AI library written in python.
Kaggle	Machine learning community that provides datasets

CHAPTER 2
LITERATURE SURVEY

In our country road accidents are a negative external phenomenon associated with the expansion of road connections, traffic and urban migration in the country. A major public health problem is road injuries, leading to loss of life and chronic suffering in the victim's family resulting in disability and hospitalization. In the case of India, road injuries are the leading cause of death and loss of health for people aged 15-29. In the 2016 calendar year, the total number of road accidents reported was 4,80,652 causing injuries to 4,94,624 people and 1,50,785 deaths in the country. and their number is increasing by about 10% every year. Rail and coastal shipping accounts for about 32 percent and 7 percent, respectively, while the share of internal water and air traffic routes is less than one percent each. Trains are a cheap means of transportation and are used to transport large quantities of goods over long distances.

We have long known that the road safety situation in India is not bad, to say the least. Come to think of it, the horrible state of affairs in the state of road safety in India has always been seen by the world. And now we have another reminder of how dangerous roads are - this time from the World Bank. Yep, the World Bank has just been released a new report that makes some interesting notes about India. First, the report notes that although India is home to only one percent of the world's vehicles, it still accounts for 11 percent of the world's deaths in road accidents. This is very high in the world, by the way. It gives an even worse number: 53 road accidents occur in India regularly, killing one person every 4 minutes.

The 2019 World Bank report, Guide to Road Safety Opportunities and Challenges: Profiles of Low- and Medium Leading Countries, added that 13 lakh people were killed and another 50 lakh people were injured on Indian roads over the past decade. Wait, there is more - this report, which includes the under-reporting and crash statistics of the Department of Transport and Highways, estimates that accidents have cost the country a significant amount.

Road accidents in India: The cost we pay

Interestingly, the report states that the car accident and major damage costs of 2016 stood at 7.5 percent of India's GDP or 9 12.9 lakh crore. This is more than double the price imposed by the Indian government - i.e. 3 percent of GDP or ₹ 4.3 lakh crore. Personally speaking, road accident injuries and deaths lead to financial stress and push poor households into poverty and those already in debt.

Nitin Gadkari, Minister of Trade Unions for Roads and Highways, recently described the state of road accidents in India as "more dangerous than the COVID-19 epidemic". He also added that preventing death and reducing injuries during road accidents can have significant financial benefits as well. Gadkari said the estimated cost of death in a road accident was about .1 91.16 lakh.

Causes of Road Accidents

A road accident is something that is less likely to happen to a road user, even though it happens more often. What’s worse is that we don’t learn from our street mistakes. Most road users are well aware of the general

rules and safety measures while using the roads but only the partial relaxation of road users, causing accidents and accidents. The main cause of accidents and crashes is human error.
Various national and international studies have found this to be the most common behavior of motorists, leading to accidents.

Over Speeding:
Most fatal accidents occur as a result of excessive running. It is the natural psyche of human beings to excel. Given the opportunity, a person certainly gains immortality. But if we share the road with other users we will always be left behind in one or another car. The increase in speed increases the risk of an accident and the magnitude of the injury during the accident. Fast cars are usually more dangerous than slow cars and the risk of an accident will also be greater if the speed of the accident will also be greater if there are faster cars. Higher speed, greater risk. At high speeds the car needs more distance to stop braking. A slow-moving car stops quickly while another fast car takes a long way to stop and slides a long way due to the law of gravity. A high-speed car will have a significant impact during an accident and will therefore cause a lot of damage. The ability to judge future events also decreases while you are driving at a fast speed that creates an error in the judgment and eventually crashes.

Drunken Driving:
Drinking alcohol to celebrate any occasion is common. But when combined with driving, it turns the celebration into a nightmare. Alcohol reduces concentration. It reduces the reaction time of the human body. The organs take a lot of reactions to brain instructions. It disturbs vision because of dizziness. Alcohol reduces fear and encourages people to take risks. All of these things while driving create accidents and often prove fatal. For every 0.05 blood pressure increase, the risk of an accident doubles. In addition to the many drugs, drugs also affect the skills and concentration needed while driving. First of all, we recommend that you do not drink alcohol. But if you feel that your pleasure is not complete without alcohol, do not drive under the influence of alcohol. Ask a teetotaler friend to leave you at home.

Distraction to Driver:
Although disturbances while driving may be minor, they can cause significant accidents.

Disruptions can be outside or inside the car. The biggest distraction now these days is talking on the phone while driving. The act of talking on the phone takes up a large part of the brain and a small part deals with driving skills. This division of the brain disrupts the response time and the ability to judge. This is one of the reasons for the crash. One should not pay attention to calls while driving. If the call is urgent the person must get out on the sidewalk and be on the phone. Some of the roadblocks are:
1.Fixing glasses while driving
2.Stereo / Radio in the car
Animals on the way
4. Banners and billboards.
The driver should not be distracted by these things and reduce the speed of staying safe during diversions and other types of external disturbances.

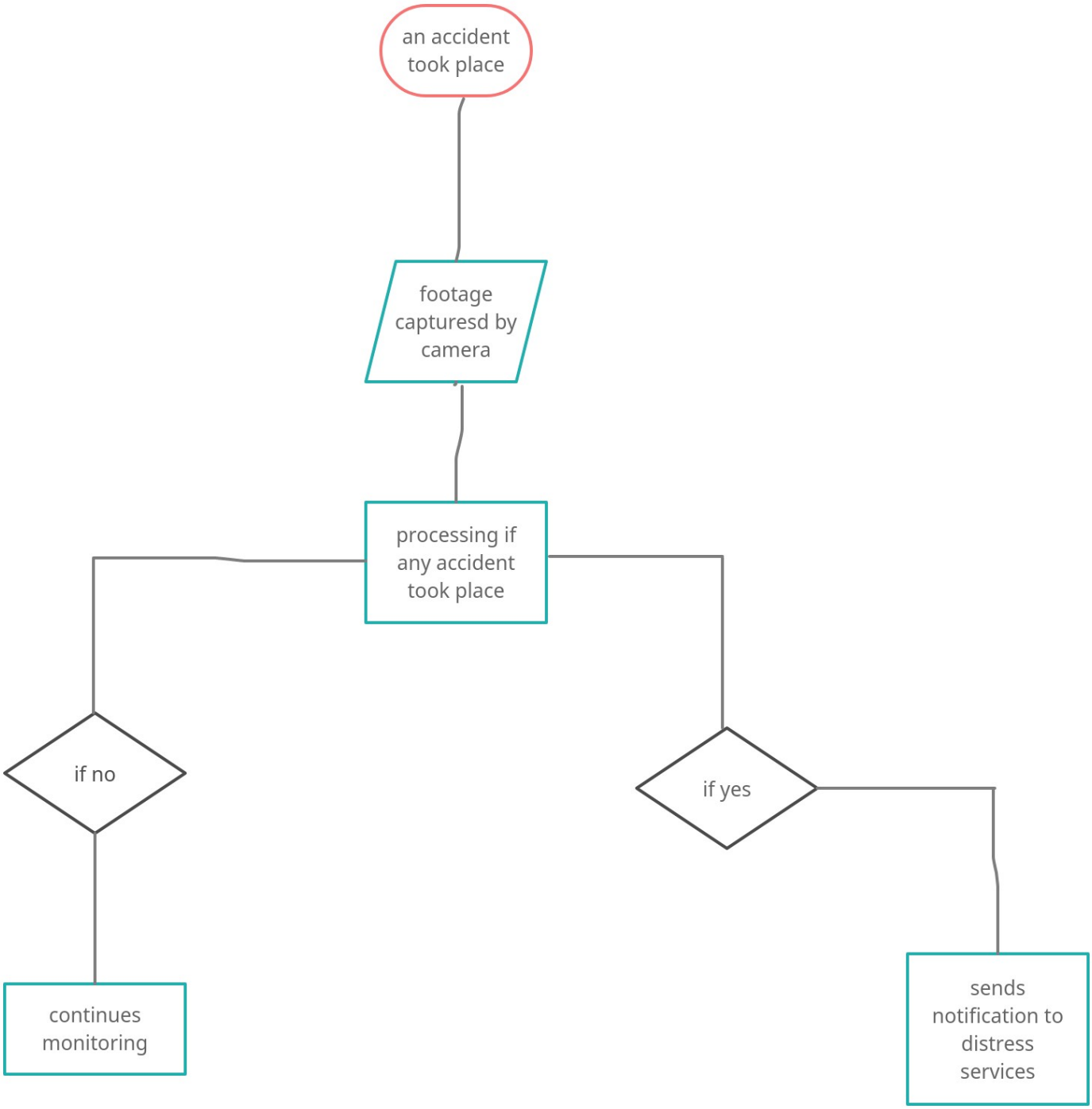
Red Light jumping:
It is a common sight at road intersections that vehicles cross without caring for the light. The main motive behind Red light jumping is saving time. The common conception is that stopping at red signal is wastage of time and fuel. Studies have shown that traffic signals followed properly by all drivers saves time and commuters reach destination safely and timely. A red light jumper not only jeopardizes his life but also the safety of other road users. This act by one driver incites other driver to attempt it and finally causes chaos at crossing. This chaos at intersection is the main cause of traffic jams. Eventually everybody gets late to their destinations. It has also been seen that the red light jumper crosses the intersection with greater speed to avoid crash and challan but it hampers his ability to judge the ongoing traffic and quite often crashes.

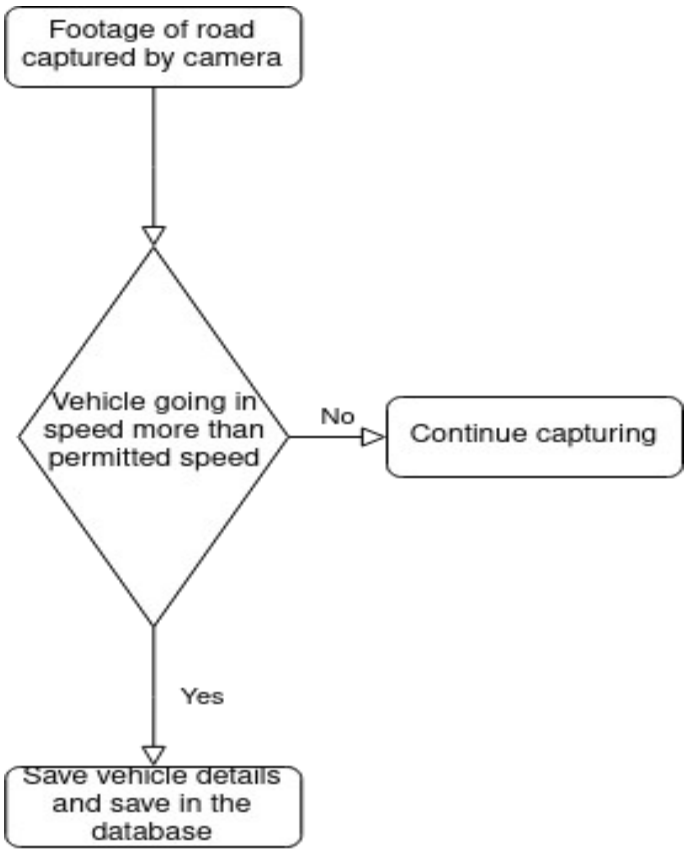
3. Research Paper (Accepted / Communicated / Published) with proof.

Avoiding Safety Gears like seat belts and helmets:

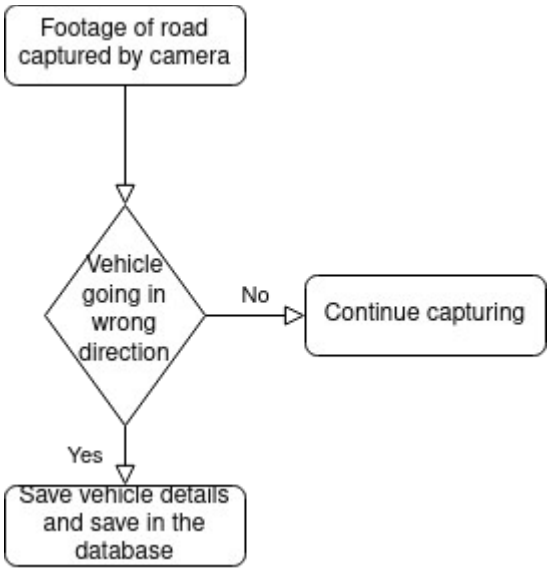
Use of seat belt in four-wheeler is now mandatory and not wearing seat belt invites penalty, same in the case of helmets for two wheeler drivers. Wearing seat belts and helmet has been brought under law after proven studies that these two things reduce the severity of injury during accidents. Wearing seat belts and helmets doubles the chances of survival in a serious accident. Safety Gears keep you intact and safe in case of accidents. Two wheeler deaths have been drastically reduced after use of helmet has been made mandatory. One should use safety gears of prescribed standard and tie them properly for optimum safety.

CHAPTER 3
Project Design





Over Speeding



Wrong Way Detection

CHAPTER 4
Modules Description

1.Object_detection.py:

This module takes an sample video as input and with the help of openCV, TenserFlow and sys it trains an machine learning model with the datasets provides in the directory. Datasets are taken from several different sources. It shows the confirmation of accident in percentage.

2.Object_detection_webcam.py:

this module takes webcam video as input and with the machine learning model and the datasets provided it detects if a crash has taken place.

3.download.py:

it downloads the several different datasets and modules from cloud storage which are then used for detecting the crashes in the other modules.

CHAPTER 5
Conclusion

With the above report we can conclude that accident can be detected by training previous accident datasets available from different sources in our machine learning model. Using the same approach we can modify the available serviellance cameras according to our need and detect any accidents on road and then send distress notifications to nearest authorities.

CHAPTER 5
Conclusion and Future Scope

Conclusion:

With the above report we can conclude that accident can be detected by training previous accident datasets available from different sources in our machine learning model. Using the same approach we can modify the available serviellance cameras according to our need and detect any accidents on road and then send distress notifications to nearest authorities.

Future Scope:

Using similar approach we can add more functionalities for road safety. Such as car speed detection, wrong way driving, rash driving etc. With everything automated there will be an extremely low chance of mistake and less man power will be needed to monitor roads for road safety.

CHAPTER 6
Reference

With the above report we can conclude that accident can be detected by training previous accident datasets available from different sources in our machine l

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