AUTOMATED ACCIDENT DETECTOR

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PROBLEM STATEMENT

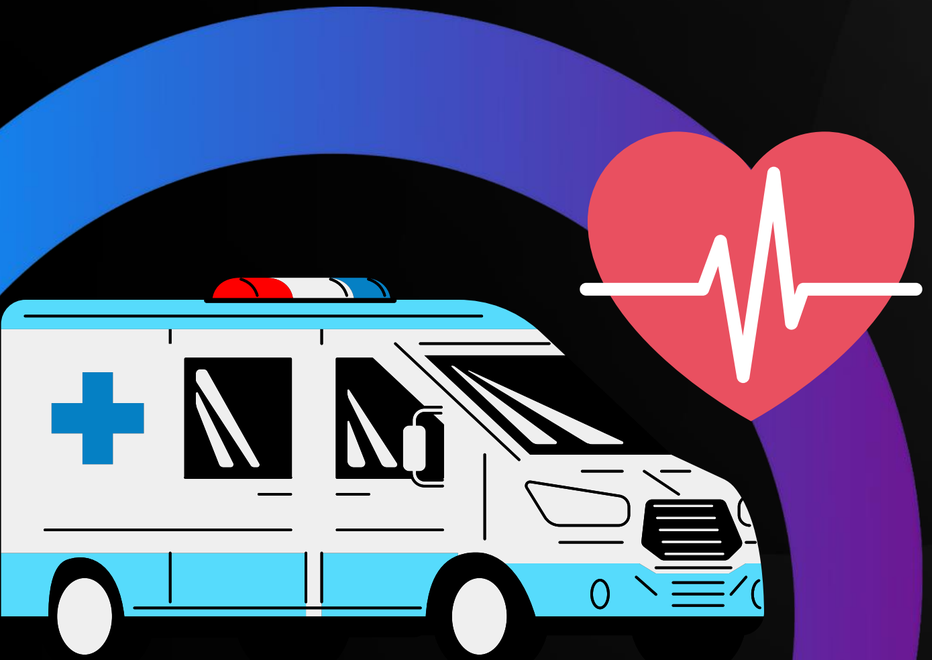
Automobile collisions have become worse in the present day. Traffic congestion is the consequence of a growing numbers of individuals deciding to drive their own automobiles on top to availing trains and buses in urban areas.

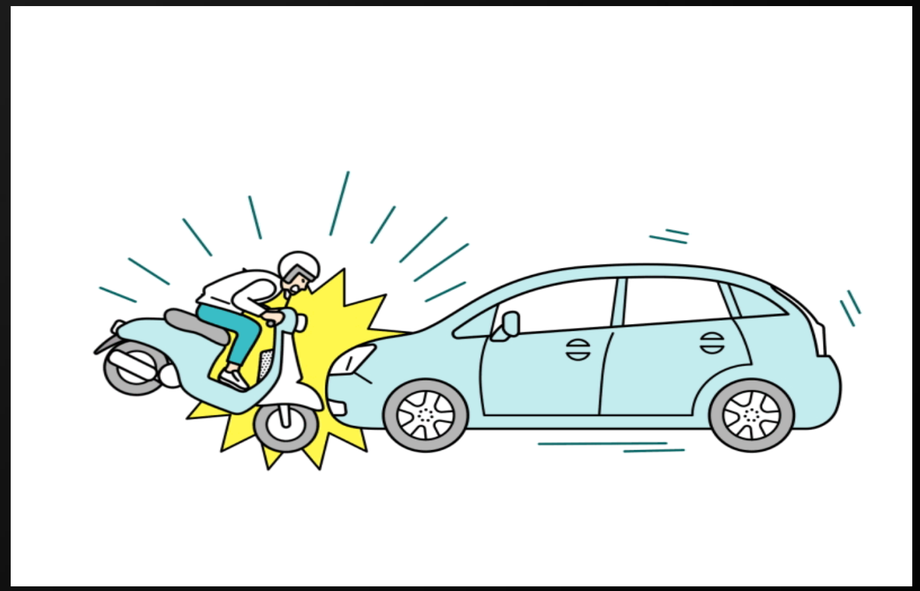
The population's neglect and contempt for regulations regarding driving are the primary root causes of mishaps occurring on roads and highways. As a consequence of this, a substantial amount of people lose their lives.

Moreover, a great deal of victims of accidents remain in fatal wounds, which can be catastrophic if they fail to seek immediate medical treatment.

ABSTRACT

- *The project aims to design and develop a system to promptly and accurately identify road accidents and alert the ambulance services as quickly as possible.*
- *Optimizing deep learning models such as the YOLO V7 algorithm for accident detection and alert systems enhances the system's effectiveness, precision, and real-time performance of the system.*
- *This can help minimize the time it takes for emergency services to respond by notifying them immediately upon the detection of an accident.*





OBJECTIVES

Our project's primary goal is to drastically decrease the total number of mortality and disruptive cases arising from traffic accidents.

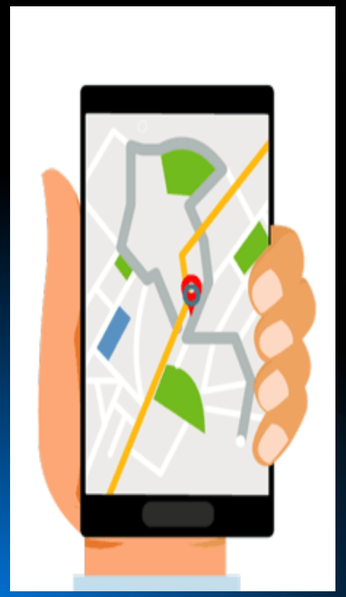
Deep learning technology is employed to monitor and detect abrupt acceleration of vehicles during crashes.

CCTV cameras are incorporated by the YOLOv7,in order to track the encounters between any two automobiles.

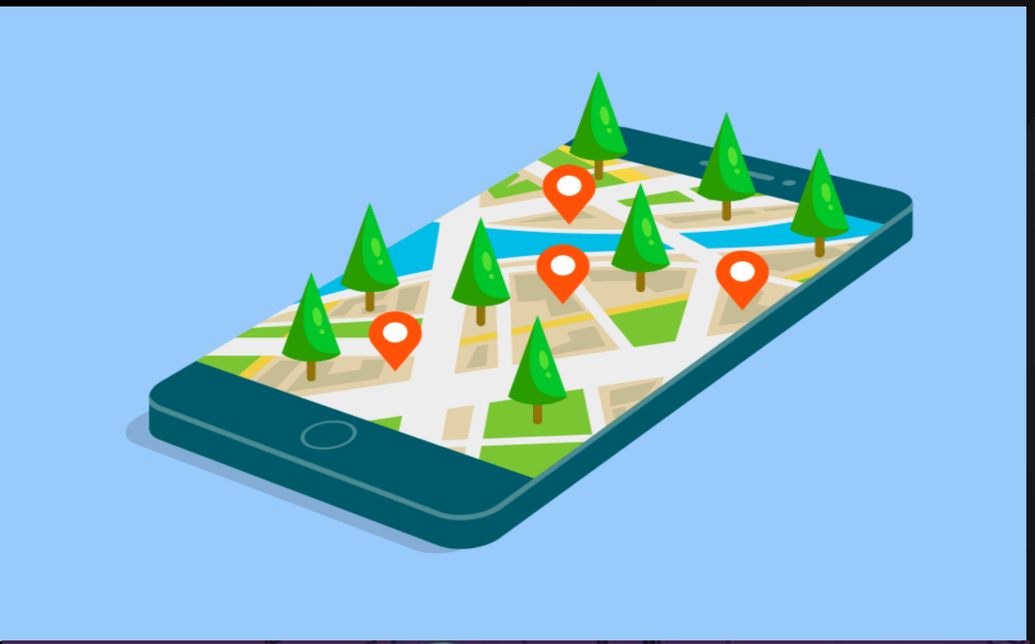
Once detected, the injured victims are given proper medical attention at the earliest by alerting the nearby ambulance service

PROPOSED SOLUTION

- *Our project mainly focuses on the automated detection of road accidents by **CCTV** and immediate information is passed to the concerned people.The surveillance cameras deployed with our deep learning algorithm, YOLO's latest model, are installed in accident-prone remote areas of the cities.*
- *When an accident occurs, the system detect the collision using the **YOLO algorithm.***
- *By deploying **acoustic sensors** along with the deep learning algorithm, we can increase the accuracy of accident detection by minimizing the possibility of false outcomes by jointly evaluating the outputs/results generated by the acoustic sensor and the deep-learning object detection model.*
- *After the detection of an accident, it **notifies the ambulance drivers** through a message or phone call along with the location.The necessary remedy is given to the victims by alerting the nearby emergency service to report to the spot as soon as possible.*

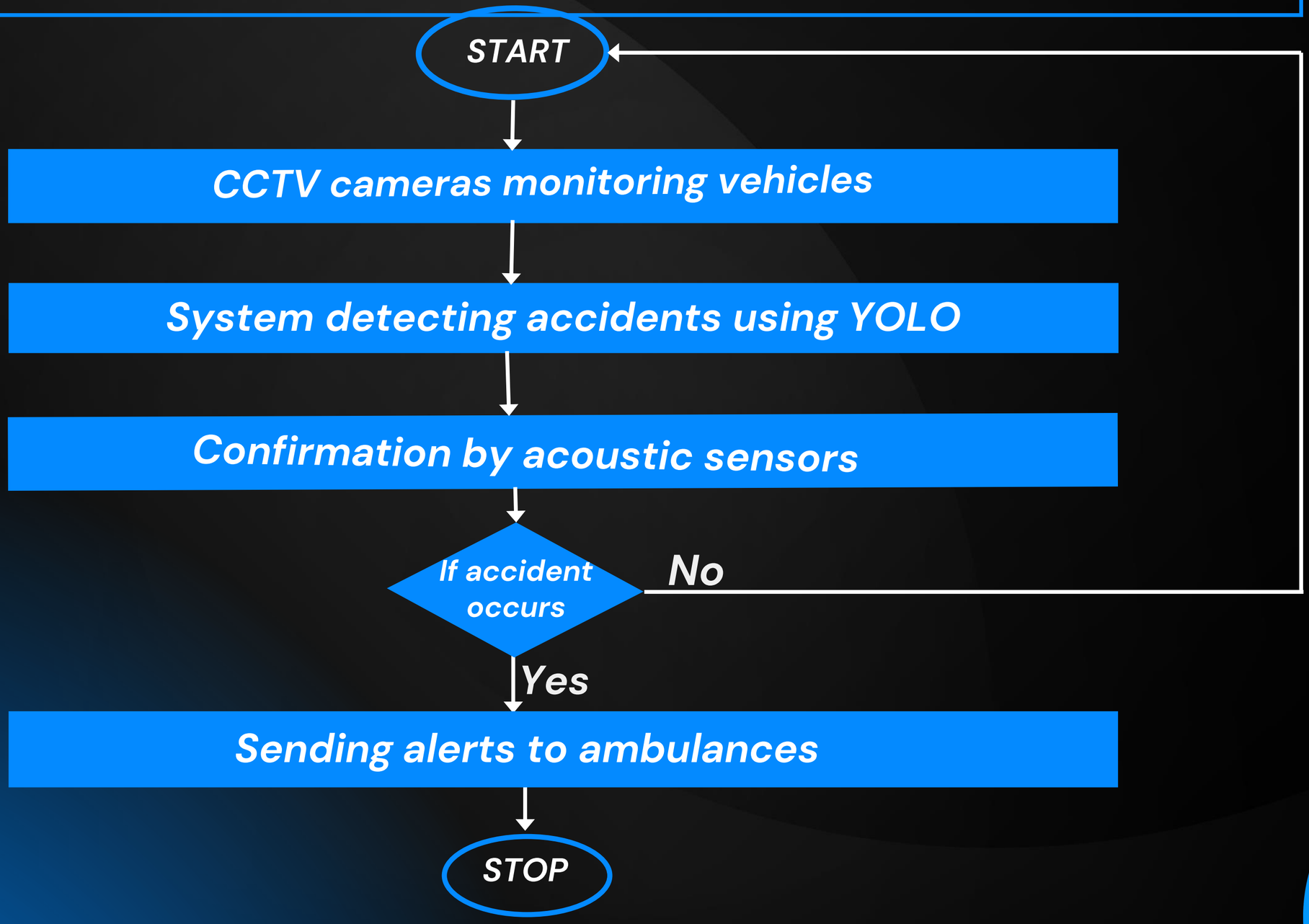


EXISTING SYSTEM



In existing method ***Data Mining techniques*** *are used to identify the locations where high frequency accidents are occurred and analyze them to identify the factors that have an effect on road accidents at that locations. As such a system is needed which is perfectly able to co-ordinate between the different actions that is to be taken for the quick response at the accident location. As per the research such detection system involves different technologies such as* ***Global Positioning System [GPS] & Global System for Mobile Communication [GSM], applications of mobile phones****, etc. All the vehicles are included under these detection systems and other technologies are also considered for the same.*

ARCHITECTURE DIAGRAM



WORKING OF THE PROJECT

CCTV

CCTV cameras are installed in remote areas where there is lower chances of reporting the accidents

Accident Detection

YOLOv7 is deployed to track the abrupt motion of vehicles and detect the road accidents

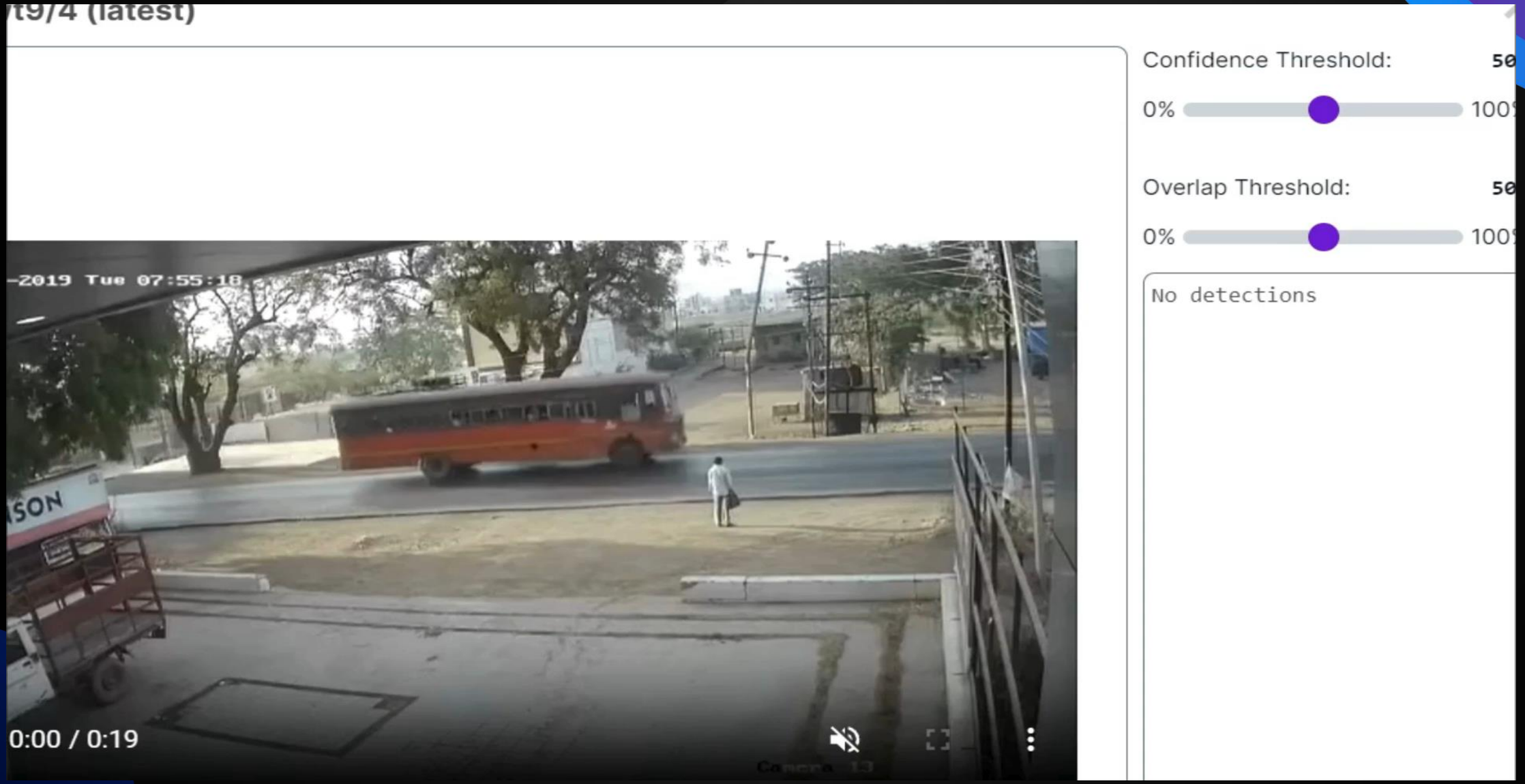
Acoustic Sensor

For further verification and to ignore inaccurate detections, acoustic sensor comes into play

Alert System

Alerts are sent to nearby ambulance drivers via SMS and they report to the spot immediately

MODULE DEMO
Accident Detection



MODULE DEMO
Accident Detection

0% 100%

Overlap Threshold: **50%**

0% 100%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{
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      "confidence": 0.602,
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      "class_id": 2,
      "detection_id": "330b2ee
    }
  ]
}
```

MODULE DEMO
Accident Detection

Samples from Test Set

View Test Set →

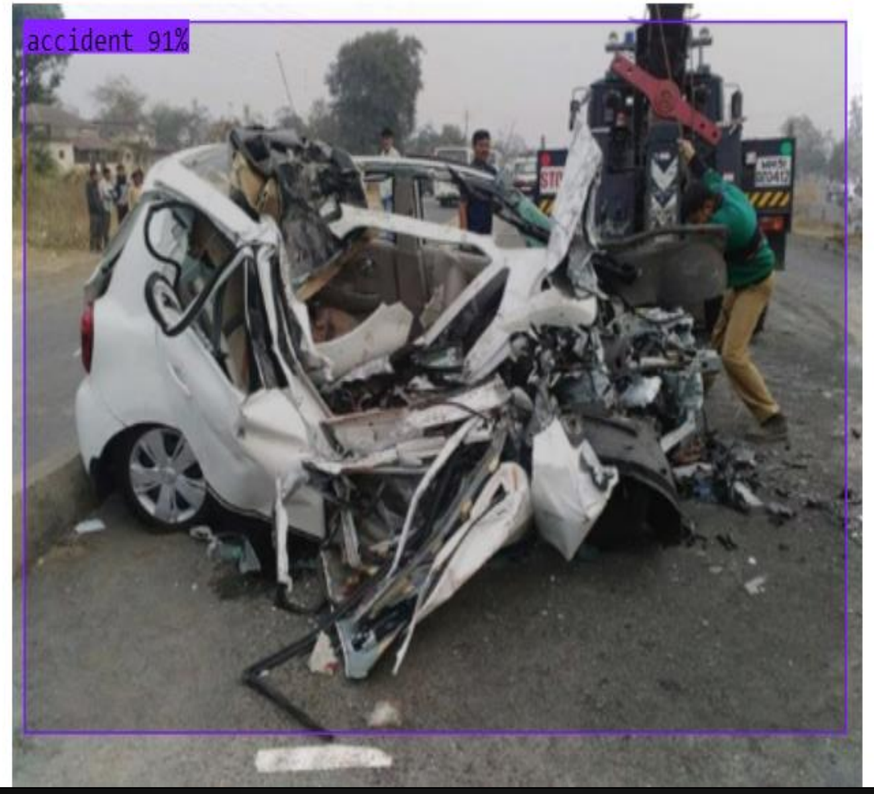
Upload Image or a Video File

Drop files here or

Select File

Paste YouTube or Image URL

Paste a link...



Confidence Threshold: 50%

0% 100%

Overlap Threshold: 50%

0% 100%

Label Display Mode:

Draw Confidence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      "height": 271,
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      "class": "accident",
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    }
  ]
}
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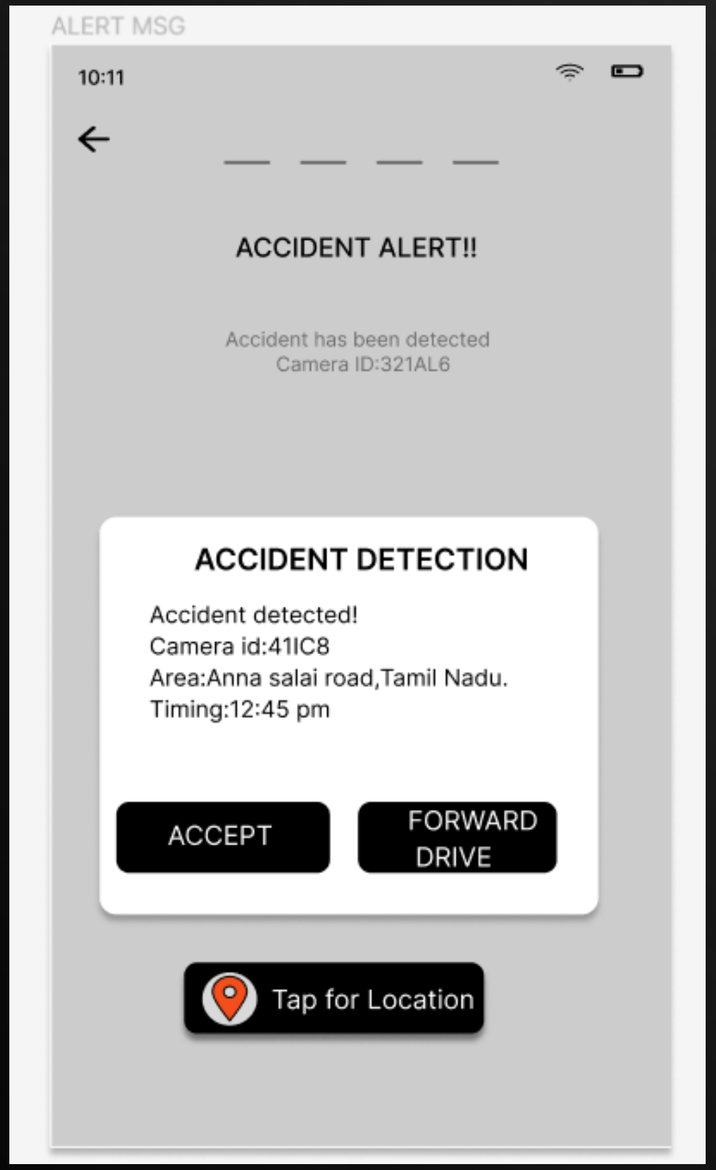
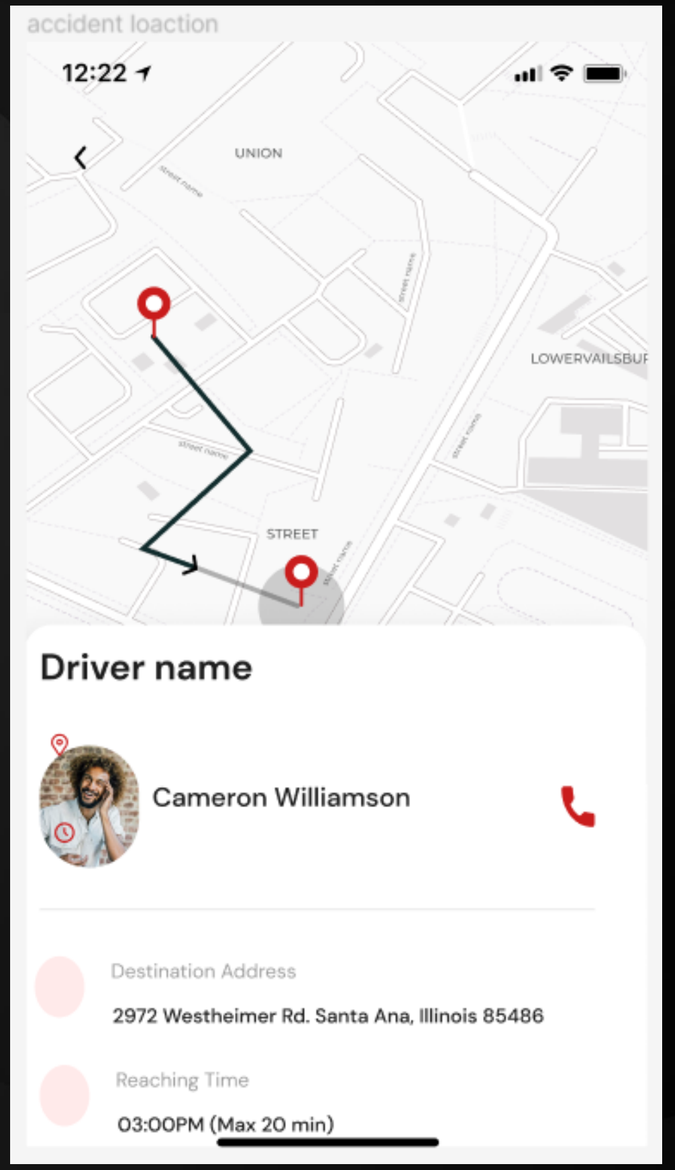
ALERT TO AMBULANCE DRIVERS





IMPACT ON SOCIETY

- *Sustainable Development Goal 3 (SDG 3) aims to "Ensure healthy lives and promote well-being for all at all ages". Enhancing access to healthcare services, including emergency medical care and implementing preventive measures can help reduce premature deaths and injuries, aligning with SDG 3's target to reduce the global mortality rate.*

- *Accidents often result in injuries or fatalities, causing immense personal suffering for victims and their families. This can lead to emotional trauma, financial strain, and long-term disabilities.*

- *By understanding the profound effects of accidents on individuals and communities, we can empathize with those affected and work towards minimizing their occurrence and mitigating their impact.*

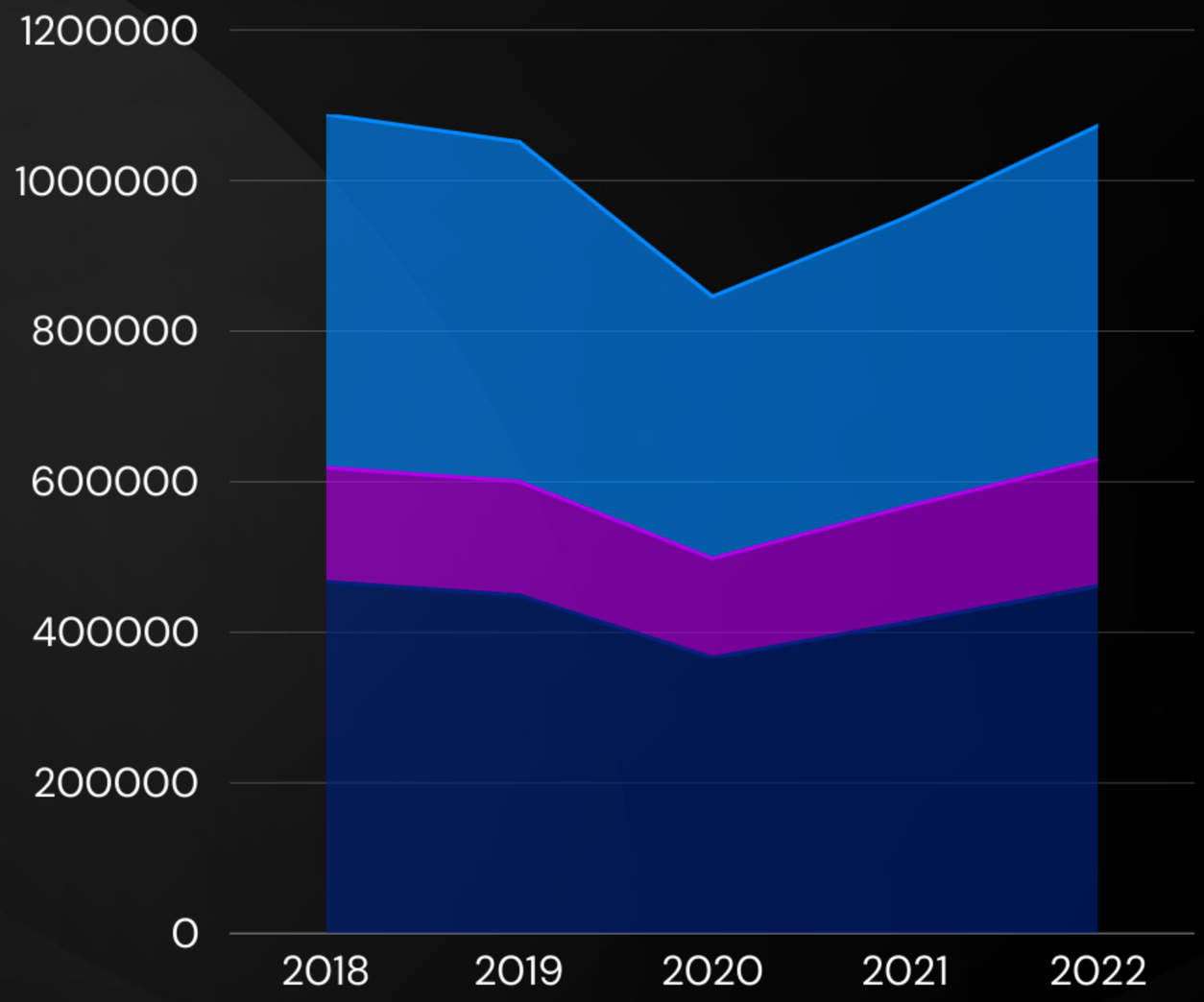
STATISTICS

This graph would display the trend in the total number of accidents, fatalities and recoveries recorded each year has been increasing, decreasing, or remaining relatively stable over time.

14.6%
Number of accidents

18.1%
Number of fatalities

11.8%
Number of recoveries



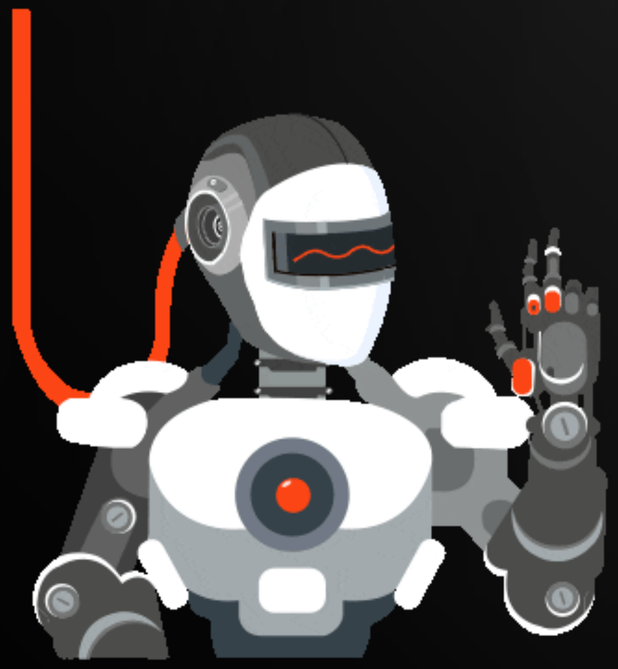
CONCLUSION

- *The project's goal is to design and develop a system that can recognise traffic incidents fast and accurately, notify the relevant authorities, and dispatch emergency services as soon as feasible.*

- *By alerting emergency services shortly as an accident is detected, this can help save the time it takes for them to arrive, as well as the chances of avoiding fatalities and lowering the severity of casualties sustained in the collision.*

- *Our project can pose a major impact on diminishing the loss of lives on roads by acting rapidly to rescue the injured victims and availing them with the proper medical treatment.*

The best way to find yourself is to lose yourself in the service of others

THANK YOU

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