IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Road Accident Detection Using Data Science Technology

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Abstract:

The system is designed to work with live video feeds from cameras installed in strategic locations.It employs object detection algorithms to identify and track vehicles in real-time, allowing for accurate traffic analysis. The system incorporates speed violation detection by defining speed limit lines and calculating the speed of vehicles passing through those lines. Violation instances are flagged, and images or videos of the violations are captured for further analysis or evidence purposes. The project also includes a user-friendly interface that provides real-time trafficstatistics, including the total number of vehicles, traffic congestion levels, and detected violations. Additionally, the system offers configurable settings for road-specific parameters, such as speedlimits and the number of allowed vehicles. The proposed system aims to enhance traffic management and improve road safety by providing timely and accurate information to authorities.It can aid in monitoring traffic patterns, identifying congested areas, and enforcing speed limits. The system has the potential to reduce accidents, enhance traffic flow, and contribute to efficienttransportation management.Overall, the project showcases the effective utilization of computer vision and deep learning algorithms to develop a comprehensive traffic monitoring and violation detection system that cansignificantly impact road safety and traffic management.

Keywords: Traffic Management,Traffic Flow,Deep Learning Algorithms,Traffic Monitoring,Computer Vision.

1. INTRODUCTION

The project focuses on developing a real-time traffic monitoring and violation detection system usingcomputer vision and deep learning techniques. With the ever-increasing volume of vehicles on the roads, it has become crucial to implement advanced technologies for efficient traffic management and enhanced road safety. This project aims to address these challenges by leveraging state-of-the- art algorithms and technologies. The main objective of the project is to design and implement a system that can monitor traffic flow, count the number of vehicles, and detect potential speed violations in real-time. By utilizing computer vision techniques and deep learning algorithms, the system can analyze video feeds from cameras installed at strategic locations to provide valuable insights and

assist authorities in managing traffic effectively. The system incorporates the YOLO (You Only Look Once) algorithm, a popular object detection and tracking technique, to identify andtrack vehicles with high accuracy and speed. It takes advantage of the speed and efficiency of YOLOto process video frames in real-time, ensuring timely detection of traffic violations. The system incorporates the YOLO (You Only Look Once) algorithm, a popular object detection and tracking technique, to identify and track vehicles with high accuracy and speed. It takes advantage of the speedand efficiency of YOLO to process video frames in real-time, ensuring timely detection of traffic violations. The project also focuses on speed violation detection, which is a critical aspect of road safety. By defining speed limit lines and calculating the speed of vehicles passing through those lines,the system can identify vehicles that exceed the speed limit and flag them as potential violations. Capturing images or videos of these violations provides evidence for further analysis or lawenforcement purposes. To provide a user-friendly interface, the project includes a dashboard that displays real-time traffic statistics, including the total number of vehicles, traffic congestion levels, and detected violations. The system allows for customization of road-specific parameters, such as speed limits and the number of allowed vehicles, to adapt to different road conditions and requirements.

2. LITERATURE SURVEY

In this study, it is suggested to make use of a GPS receiver's ability to track a vehicle's speed, identify accidents based on the speed monitoring, and report the location and time of the accident using GPSdata processed by a micro-Controller via the GSM network to the Alert Service Centre. When brakinghard, it takes longer to come to a complete stop. Braking distance and square of speed are inversely proportional. As a result, there is less chance of averting a collision. The maximum speed is forecast in a tabular column once the deceleration considerations are taken into consideration. Because of this,it would be assumed that an accident has occurred if the speed is below these permissible speeds andanother deceleration force has operated on the vehicle to slow it down. Vehicle speed reductions canalso be found using the speedometer, but to get the speed from the speedometer, you need an analogueto digital converter. Therefore, a GPS is always utilized to track the speed of the vehicle. GPS constantly calculates the vehicle's speed. If the new speed values drop, an ALARM for accident detection is raised. The emergency will then be terminated after 5 seconds. If not, the emergency is routed to the Alert Service Center, which uses the GSM number it receives to map the accident's location. after it, saving the person.

3. EXISTING SYSTEM

We hear from family members, read about incidents in the news, and occasionally even experience them directly. Delays in receiving medical attention are the main cause of mortality.They notify friends and relatives about the emergency services as part of the current system. Theyalso use a few IOT devices that are connected to the cars. To attach an IOT device to every car isexpensive and complex. Today, it is possible to anticipate which situations or locations may be more likely to result in accidents and take appropriate preventive action. The preceding study suggests using a GPS receiver's ability to track a vehicle's speed, detect accidents based on thatspeed, and relay the position and time of the accident using GPS data that has been processed by a micro-controller. Vehicle speed reductions can also be detected using the speedometer.

Problems in the Existing System:

1. **Cost:** It is expensive. Implementing a comprehensive project that involves connecting an IOT devices and other components can be expensive. The cost of equipment,software, development, and maintenance may pose a challenge, particularly for budget-constrained projects.
2. **Technical Complexity:** Connecting an IOT device to every vehicle is not very easy. Integrating different technologies and ensuring their seamless operation can be technically challenging. Dealing with

multiple hardware and software components, compatibility issues, and complex configurations may require advanced technical expertise.

3. **User Acceptance and Adaptation:** In previous projects, introducing new technology and processes may face resistance or challenges in user acceptance and adaptation. Users, such as drivers or operators, may require training to effectively use the system and understand its benefits. Resistance to change or a lack of user adoption can hinder the project's success.

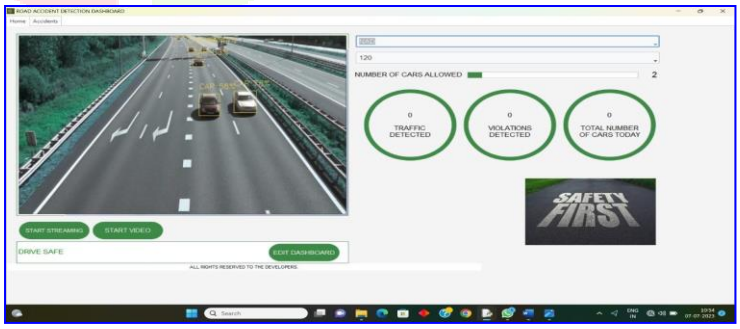
4. PROPOSED SYSTEM

A facility that provides immediate medical assistance to the accident location can reduce the rateof death to a great extent. Therefore, the idea of an alert system comes into existence which, aftersensing and accident, will send and SOS emergency notification to nearby medical facility and tothe nearest police station as well. The major objective is to incorporate such a system that is ableto detect an accident from the video footage provided to by using cameras. The system incorporates such a design, as a tool that helps out accident victims in time of need by detecting an accident on time and henceforth informing the authorities of the same through messages etc. The main focus is to detect an accident within seconds of it happening by using advanced Deep Learning Algorithm.The system is designed to work with live video feeds from cameras installed in strategic locations. It employs object detection algorithms to identify and track vehicles in real-time, allowing for accurate traffic analysis. The system incorporates speed violation detection by defining speed limit lines and calculating the speed of vehicles passing through those lines. Violation instances are flagged, and images or videos of the violations are captured for further analysis or evidence purposes. The project also includes a user-friendly interface that provides real-time traffic statistics, including the total number of vehicles, traffic congestion levels, and detected violations. Additionally, the system offers configurable settings for road-specificparameters, such as speed limits and the number of allowed vehicles.

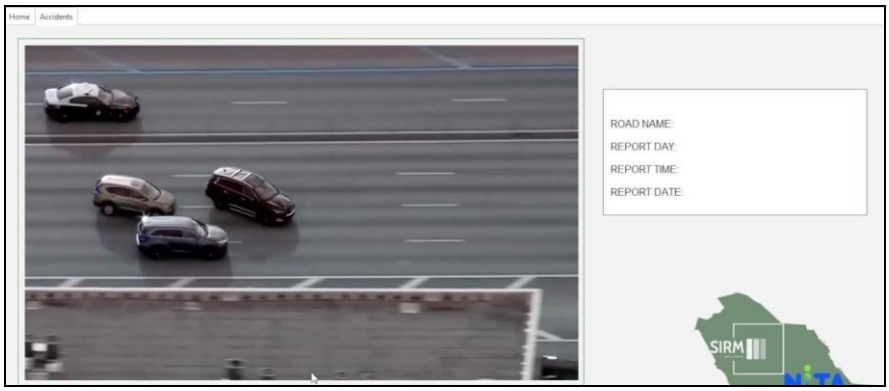
5. EXPERIMENTAL RESULTS

From the below figures it can be seen that proposed model is more accurate in order to prove our proposed system.

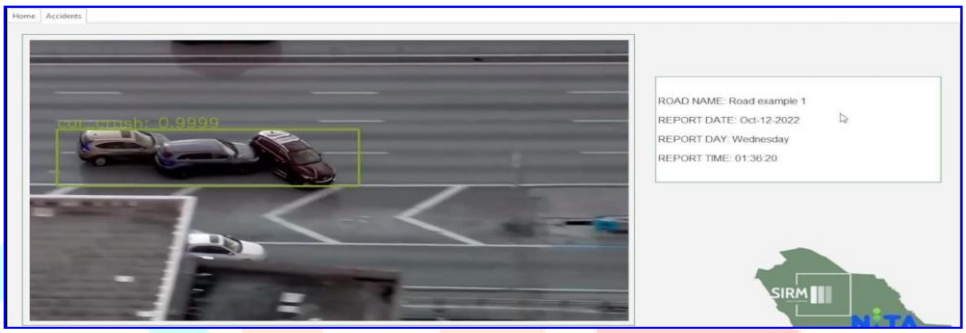
User Interface:



User Interface Before Accident Detection:



Interface after Detection of an Accident



6. CONCLUSION

In conclusion, the above project is a comprehensive system for traffic monitoring and management. It utilizes computer vision techniques, specifically the YOLO algorithm, to perform real-time object detection, speed violation detection, and vehicle counting. The project integrates multiple components such as camera input, image processing, object detection, and user interfaceto provide a holistic solution for traffic analysis.

Throughout the project, various software tools and technologies have been employed, including OpenCV for computer vision tasks, Python programming language for coding the system, and the YOLO algorithm for accurate and efficient object detection. The system incorporates a user- friendly interface for easy configuration and monitoring of traffic-related parameters. The project demonstrates several advantages, including real-time processing of video streams, accurate object detection, and speed violation identification. It provides valuable information for traffic management, allowing authorities to monitor traffic flow, detect violations, and make informed decisions to enhance road safety and efficiency.

References

[1]. T Kalyani, S Monika, B Naresh,Mahendra Vucha, Accident Detection and Alert System, IJITEE, March 2019(Base paper).

[2]. Md. Syedul Amin, Jubayer Jalil, M.B.I.Reaz, Accident Detection and ReportingSystem using GPS,GPRS and GSM Technology, IEEE,2012.

[3]. Sayanee Nanda, Harshada Joshi, Smitha Khairnar, An IOT Based Smart Systemfor Accident Prevention and Detection, IEEE,2018.

[4]. S.B. Pawar, Digvijay Mahamulkar, Laxmikant Somwanshi -Vehicle AccidentDetection System using GSM and GPS ,2019, IRJET.

[5]. R. Kanmani, R. Rakhul, R. Sakthivel - Vehicle Tracking and Accident DetectionSystem Using GPS AND GSM Module (@ IJRAR April 2022)