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ijircce@gmail.com



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# A Survey on IOT Based Accident Detection System for Smart Vehicles

Rohan Abnave<sup>1</sup>, Rakesh Abnave<sup>2</sup>, Ashish Janrao<sup>3</sup>, Tejas Chumbalkar<sup>4</sup>, Prof. M. K. Nivangune

B.E Student, Department of Computer Engineering, Sinhgad Academy of Engineering, Kondhwa(Bk), Pune,  
Maharashtra, India<sup>1,2</sup>

Professor, Department of Computer Engineering, Sinhgad Academy of Engineering, Kondhwa(Bk), Pune,  
Maharashtra, India<sup>3</sup>

**ABSTRACT:** With population growth, the demand for vehicles has increased tremendously, which has created an alarming situation in terms of traffic hazards and road accidents. The road accidents percentage is growing exponentially and so are the fatalities caused due to accidents. However, the primary cause of the increased rate of fatalities is due to the delay in emergency services. Many lives could be saved with efficient rescue services. The delay happens due to traffic congestion or unstable communication to the medical units. The implementation of automatic road accident detection systems to provide timely aid is crucial. Many solutions have been proposed in the literature for automatic accident detection. The techniques include crash prediction using smartphones, vehicular ad-hoc networks, GPS/GSM based systems, and various machine learning techniques. With such high rates of deaths associated with road accidents, road safety is the most critical sector that demands significant exploration. In this paper, we present a critical analysis of various existing methodologies used for predicting and preventing road accidents, highlighting their strengths, limitations, and challenges that need to be addressed to ensure road safety and save valuable lives.

**KEYWORDS:** Accident detection, smart modules, research, CNN, Evolutionary many-objective optimization, evolutionary multi-objective optimization (EMO).

## I. INTRODUCTION

### A. OVERVIEW

Due to rapid growth of world population, the demand for vehicles has increased tremendously, resultantly problems of traffic congestion and road accidents has also increased. The general population's life is under high risk, if any accident occurs there's a long reaction time which increments the number of deaths, therefore an automatic accident detection system must exist to overcome this situation. There can be multiple causes of road accidents, some of them are, driver negligence due to drowsiness, driving while intoxicated over speeding etc. Some studies show that weather conditions can also contribute towards the severity of an accident such as fog, rain, high winds. High winds can directly influence the vehicle which may deviate the vehicle from road, or indirectly due to obstruction dangers present on the roads such as trees, walls etc. Road crashes can be seen as a collision between any on road vehicles, obstacles or pedestrians. The survival rate of victim is highly reliant on how long an ambulance takes to reach the site of the accident and then carry the patient to the hospital. In most cases of road accidents, the injuries are not severe and the life of the victim can be rescued, however due to late arrival of the rescue teams, the injuries turn deadly.

#### I.A.1 Motivation

The consequences of road accidents are not just constrained to the loss of human lives yet, also incorporate the destruction of property, traffic blockages, and immense economic loss. Thus, automatic accident detection systems are the need of time, which can speed up the rescue operations and limit the casualties after the mishap and numerous lives can be saved. This paper features existing mechanisms to detect accidents, its working, and limitations. Furthermore, accident prevention methodologies, accident contributing factors are highlighted as well. This study critically reviews existing literature on accident detection and prevention techniques, with the objective that smart systems can be

developed with improved accuracy and better strategies to control accident-causing factors while watching out SAE Department of Computer Engineering 2021 3 for the existing challenges in the current systems.

#### I.A.2 Objective

- 1. Immediate information will be send to relatives of accident victim.
- 2. Immediate help will be send to the accident location through SMS.
- 3. Complete coordinates of accident location will be provided to nearby ambulance.

### II. METHODOLOGY

In this paper, we present a critical analysis of various existing methodologies used for predicting and preventing road accidents, highlighting their strengths, limitations, and challenges that need to be addressed to ensure road safety and save valuable lives

### III. PROBLEM STATEMENT

We have observed that in many severe accident cases immediate help is not send which leads to death of victims; in some cases, the family members of victims are informed after a long period of time; and in some rare cases the identity of victims remain unknown. This problem is usually faced with two-wheeler vehicle where safety measures are not included yet whereas in 4-wheeler vehicle there are certain safety measures like airbags, emergency breaks,etc, hence, there is requirement for immediate help for two-wheeler vehicle.

### IV. SOFTWARE INFORMATION

In our proposed system we use CNN algorithm for the accurate result. Python is an interpreted, high-level and general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects. Python is dynamically typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented, and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library. Python was created in the late 1980s as a successor to the ABC language. Python 2.0, released in 2000, introduced features like list comprehensions and a garbage collection system with reference counting. Python 3.0, released in 2008, was a major revision of the language that is not completely backward-compatible, and much Python 2 code does not run unmodified on Python 3. The Python 2 language was officially discontinued in 2020 (first planned for 2015), and "Python 2.7.18 is the last Python 2.7 release and therefore the last Python 2 release." [30] No more security patches or other improvements will be released for it. With Python 2's end-of-life, only Python 3.6.x and later are supported. Python interpreters are available for many operating systems. A global community of programmers develops and maintains CPython, a free and open-source reference implementation. A non-profit organization, the Python Software Foundation, manages and directs resources for Python and CPython development.

### V. DATA FLOW DIAGRAM

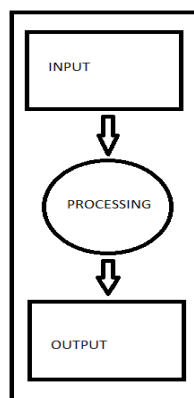


Fig : Data Flow (0) Diagram

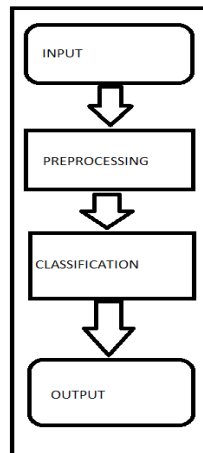


Fig : Data Flow (1) Diagram

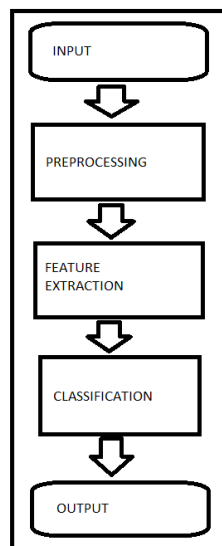


Fig : Data Flow (2) Diagram

## VI. CONCLUSION

A system to process real-time CCTV footage to detect any Anomaly activity will help to create better security and less human intervention. Great strides have been made in the field of human anomaly Activity, which enables us to better serve the myriad applications that are possible with it. Moreover, research in related fields such as Activity Tracking can greatly enhance its productive utilization in several fields.

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