

# AUTOMOBILE ACCIDENT PREVENTION USING SENSORS

Siddharth Sanjai<sup>1</sup>, Syed Sameer<sup>2</sup>, Ashlesha AnandKale<sup>3</sup>  
Somali Tiwari<sup>4</sup>, Sourabh Kewlani<sup>5</sup>

<sup>1,2,3,4,5</sup>Electronics and Instrumentation, Lakshmi Narain college of Technology (India)

## ABSTRACT

The main goal of the project is to reduce car accidents due to rash driving and bad weather conditions. The project focuses on building a user friendly device which helps the driver to have a better visibility during bad weather such as fog and also to detect intrusion. Automobile accidents can be reduced to a great extent by using this technology which not only anticipates but even warns the driver of approaching human during low visibility; using infrared and other sensors. The ultimate aim is to build an easy-to-use and driver friendly device to reduce fatal accidents.

## 1.INTRODUCTION

One of the greatest threats which every one of us facetoday is accidents on the roads. Every four minutes one person dies in India.Indian roads, which account for the highest fatalities in the world, became yet more dangerous in 2015 with the number of deaths rising nearly 5% to 14.5lakh. This translates to 400 deaths a day or one life snuffed out every 3.6 minutes, in what an expert described as a "daily massacre on our roads".It has been observed that each year number of accidents that occur in India is close to 1.3 million. Out of which around half million people suffer from non-fatal injuries with many sustaining a disability as a result of their injuries. India's daily death toll due to road accidents is more than four times the annual death toll from terrorist attacks. As many as 139,671 people lost their lives on Indian roads during 2014(Report:Ministry of Road Transport and Highways, 2014). In fact, motor vehicle accidents are most common cause of death in India than cancers and heart attacks.

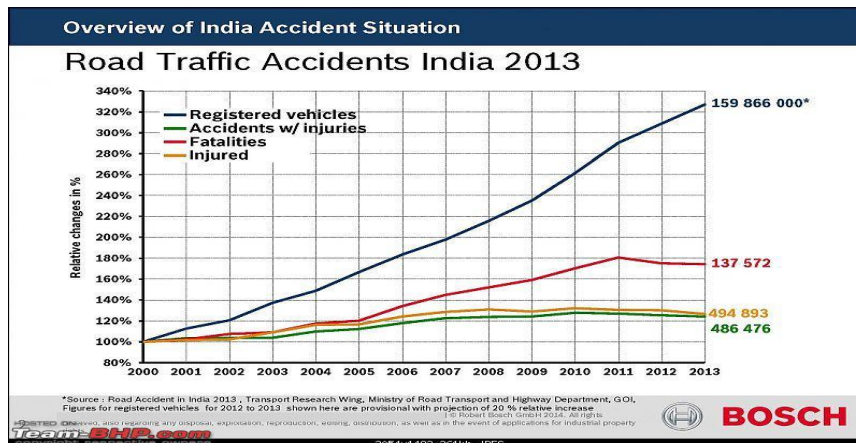


Figure-1: Showing overview of India accident Situation

(Source: Road accident in India, Transport Wing, Ministry of Road Transport and High Department, GOI, 2012-2013)

## II. SYSTEM IN MODERN DAYS ADVANCE VEHICLES

### 2.1 Anti-Locking Braking System (ABS)

ABS works with regular braking system by automatically pumping them. Vehicles which are not equipped with ABS, the driver has to manually pump or press the brakes to prevent wheel lockup whereas vehicles equipped with ABS, foot should remain firmly planted on the brake pedal, while ABS pumps the brakes for you so you can concentrate on steering to safety.

### 2.2 Electronic brake-force distribution (EBD)

Electronic brake-force limitation (EBL) is an automobile brake technology that automatically varies the amount of force applied to each of a vehicle's brakes, based on road conditions, speed, loading, etc. This is always coupled with anti-lock braking systems.

### 2.3 Supplemental Restraint System Air Bags

An airbag is a vehicle safety device. It is an occupant restraint consisting of a flexible envelope designed to inflate rapidly during an automobile collision, to prevent occupants from striking interior objects such as the steering wheel or a window, the sensors may deploy one or more airbags in an impact zone at variable rates based on the type and severity of impact; the airbag is designed to only inflate in moderate to severe frontal crashes.

### 2.4 Cruise Control

Cruise control (sometimes known as speed control or auto cruise) is a system that automatically controls the speed of a motor over the throttle of the car to maintain a steady speed as set by the driver.

## III. EXISTING SYSTEM DRAWBACKS

After doing the observation number of accidents we cleared that frequency of crashes is because of bad weather is high. The existing system only works after the accident takes place. It does not avoid accidents.

## IV. INTELLIGENT VEHICLE RESEARCH WORLDWIDE

Although the early researches on developing intelligent vehicles were seen in Japan in the 70's, but significant research activities were carried out in Europe in the late 80s and early 90s

MITI, Nissan and Fujitsu pioneered the research in this area by joining forces in the project "Personal Vehicle System". In 1996, the *Advanced Cruise-Assist Highway System Research Association* (AHSRA) was established among automobile industries and a large number of research centers. In the US, great deals of initiatives have been launched to address this problem. In 1995, the US government established the *National Automated Highway System Consortium* (NAHSC), and launched the *Intelligent Vehicle Initiative* (IVI) in 1997. Several promising prototype vehicles/systems have been investigated and demonstrated within the last 15 years.

## V. PROPOSED SOLUTION

Through present work an attempt is being made to build a device which will be very effective during bad weather including fog. The idea is to determine the closeness of the cars and also to give enough time to drivers to avoid any such accident and save lives.

For ensuring complete security the device will also include a fog sensor, navigation radar which will indicate the driver of any vehicle approaching from side-ways and an infrared sensor which will prevent any collision with human being.

## VI. COMPONENTS USED FOR THE DEVICE

### 6.1 LIDAR

Light Detection And Rangingsystems using the range of locating,ranging, and profiling applications. Such a system consists of a laser capable of transmitting light (pulsed or continuous) over the required range of interest, and a high-speed, low-noise receiver for reflected signal analysis. Transmitted light interacts with and is changed by the target.

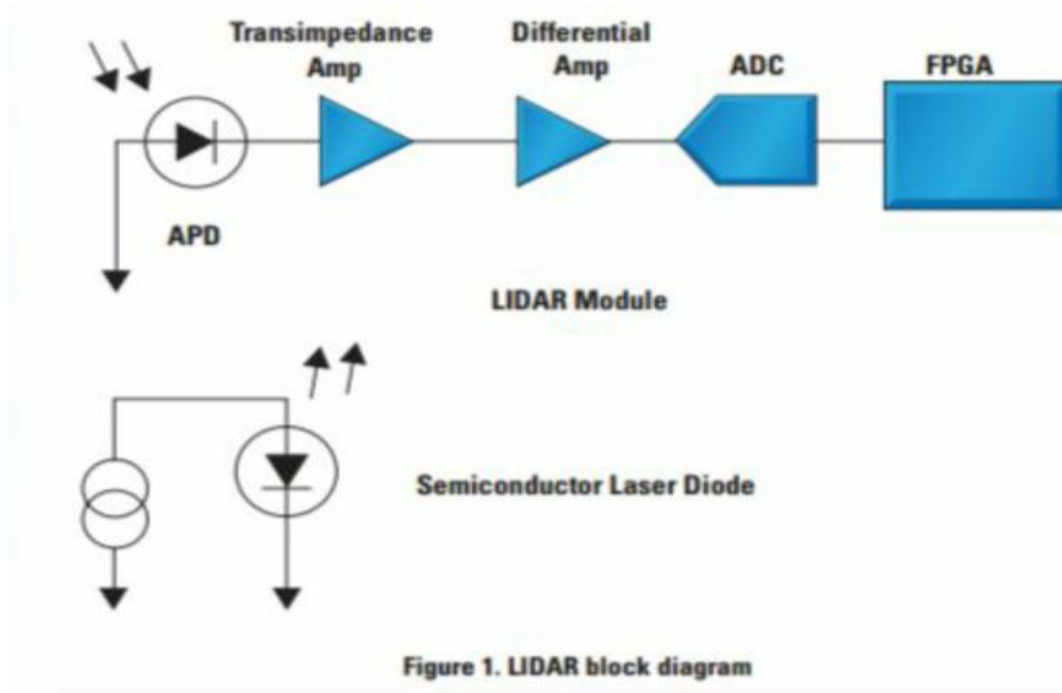


Figure-2 LIDAR Block Diagram

### 6.2 INDUCTIVE SENSORS

The LDC0851 is a close range inductive switch ideal for contactless and robust applications such as presence detection, event counting,and simple buttons.

Inductive sensing technology provides reliable and accurate sensing even in the presence of dirt, oil, or moisture making it ideal for use in harsh or non-conductive environment. The solid state switching eliminates the failures

due to reed, mechanical or contact switching. Unlike competitive products, the LDC0851 does not require magnets, nor is it affected by DC magnetic field.

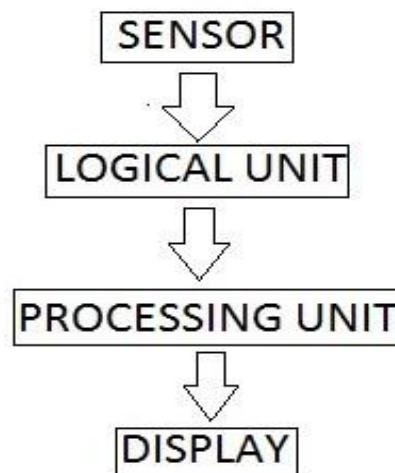
### **6.3 Ambient Light Sensor**

The OPT3001 is a single-chip lux meter, measuring the intensity of light as visible by the human eye. The precision spectral response and strong IR; rejection of the device, enables the OPT3001 to accurately measure the intensity of light as seen by the human eyes regardless of light source.

### **6.4 IR & Probe Temperature Sensors**

The TMP006 and TMP006B are fully integrated MEMs thermopile sensors that measure the temperature of an object without having to be in direct contact. The thermopile absorbs passive infrared energy from an object at wavelengths between 4 um to 16 um within the end-user defined field of view.

## **VII. BLOCK DIAGRAM**



**Figure 3: Block diagram of the system**

## **VIII. CONCLUSION**

Our system efficiently checks the accidents occurring due to extreme weather conditions. By the implantation of this system in vehicles, a safe journey is possible which would decrease the number of injuries and accident caused by harsh weather. This system will not only alert the driver during bad and foggy weather but also when vehicles are approaching from sideways. The system will also alert the driver of any human or animal presence using IR sensors. This system will detect any approaching vehicle calculating its speed, and approach time and will also inform the driver giving him or her enough time to apply the brakes and avoid an inevitable accident.

## IX. ACKNOWLEDGEMENT

It is an honor and pleasure to express our heartfelt gratitude to those who have helped us and also contributed towards this project. We are indebted to our guide Prof.ShubhiThatere, whose invaluable guidance, timely suggestion and encouragement inspired and motivated us to complete the project. We express gratitude to our parents for supporting and guiding us. We would also like to thank our college for supporting and helping us.

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