

# INTEGRATED BIKE SAFETY SYSTEM

**Mahesh Rathod<sup>1</sup>, Ranjit Pavane<sup>2</sup>, Pankaj Padwal<sup>3</sup>, Akash More<sup>4</sup>, Prof. Madan Jagtap<sup>5</sup>**

<sup>1</sup>Student, saraswati college of engineering, India, [maheshsahebrao8@gmail.com](mailto:maheshsahebrao8@gmail.com)

<sup>2</sup>Student, saraswati college of engineering, India, [ranjit.pavane@gmail.com](mailto:ranjit.pavane@gmail.com)

<sup>3</sup>Student, saraswati college of engineering, India, [pankajpadwal536@gmail.com](mailto:pankajpadwal536@gmail.com)

<sup>4</sup>Student, saraswati college of engineering, India, [more.akash1996@gmail.com](mailto:more.akash1996@gmail.com)

<sup>5</sup>Professor, saraswati college of engineering, India, [jagtap.aero@gmail.com](mailto:jagtap.aero@gmail.com)

**ABSTRACT**—Two wheelers are the most economical way of transport. Owing to this, there has been an increase in the number of two wheelers especially on Indian roads which has led to increasing number of accidents and fatality. Also lately there has been an increase in the pollution levels which has led to global warming. Keeping in mind the above problems, an integrated system was designed which will ensure the safety of riders as well as the environment. The integrated design consists of an automatic stand side retrieval, a smart helmet and a pollution sensing device. The components are integrated in such a way that the engine of the two-wheeler will start only when the helmet is worn. As soon as the helmet is worn and the engine is started, the side stand will be retrieved automatically. The pollution sensing device will start sensing the gases leaving the exhaust and as soon as the levels go above the limiting value of polluting gases, a warning beep will ring intimating that the two-wheeler is going above the pollution norms.

**Keywords:** Smart helmet; automatic stand retrieval system; PUC sensor.

**I. INTRODUCTION--** In the modern world, automobile takes a great part in the development since it plays one of a major key in daily life. Two-wheelers play a very important role because it saves the time of the traveler by reaching the target place faster. Two-wheelers, the mode of transport most Indians use, continues to be the most vulnerable to accidents. The latest data released by the home ministry has revealed

that 21% of the road death victims in 2015 in the country were riding two-wheelers. Estimates suggest that over 60% of the

country's motor vehicles are two-wheelers. Many surveys across the country have shown that the motorcycles are more prone to accidents than other vehicles. Of the major traffic rule that people fail to follow is wearing a proper helmet. The alarming increase in mortality and morbidity owing to road traffic accidents has been a matter of great concern globally. The majority (77%) of the victims in India were in the age group 18-44 years. Accident rate among males (83%) was higher than that among females (17%). Five percent of the victims succumbed to injuries, of which 45 died on the spot. Geared vehicles (81%) were more commonly involved than those without gears. The highest number of accidents was seen during 6-10 pm. There are considerable morbidity and mortality due to two wheelers road traffic accidents. Among the fatalities, majority died on the spot. One of the most important safety rules to be followed while riding a motorcycle is wearing a helmet. And it is necessary for both the riders to wear helmets as in the case of an accident the

driver, as well as the pillion is at equal risks of injury. Thus, there is no reason to think that only the driver needs protection. Another important concern for two wheelers not only in India but all around the world is the Pollution caused by the bikes. Motorcycles emit substantial quantities of hydrocarbons (HCs), carbon monoxide (CO), and particulate matter (PM). These pollutants have significant adverse health effects and deteriorate environmental quality. The contribution to urban air pollution where these vehicles are in use has become an increasingly common phenomenon. This is especially noticed in densely populated areas that rely on motorcycles as an essential means of Transportation.

## II. LITERATURE REVIEW-

### 2.1 Review on smart helmet :

Amit varshnet [1] Force sending resister inside helmet which determine helmet on , Safety of rider by smart helmet

Minakshi sandhaya [2] Smart helmet for accedental prevention , Smart helmet for accedental prevention

Oscar McLaughlin. [3] Helmet for accidention prevention , Succesfully tested the system for two wheeler

Mohd Khairul Afiq Mohd Rosily [4] Smart helmet with sensors for accedents prevention ,Helmet is wirelessly connected to bike

Rajiv singh [5] Smart bike helmet and accidental prevention Helmet is wirelessly connected to bike

Sudarshan k [6] Helmet for road hazard warning with wireless othentication , Smart helmet for accedental prevention

P. Dilip [7] Solar powered smart helmet , Use solar power for system instead of chemical cell for power supply

Vishal Srivastava [8] Smart safety helmet using IMU and EEG sensors, Control system using IMU and EEG sensor against the road hazards

Vijay j [9] Drunk and drive protection system, Design of control system for drunk and drive system

### 2.1 Review on automatic stand retrival system :

Vishal Srivastava [10] Automatic side stand , Safety and rapid action of stand retrieval system

Sanjeev N. K.[11] Sprocket-side stand retrieval system , Safety of rider by stand retrieval system

Chiris cherry [12] Bike and padestrian safety analysis , Padestrian safety

Mr.V.V.R.Murthy [13] Analysis of Sprocket Side Stand Retrieval Systems, System of sprocket chain and chain working properly

Pintoo Prjapati, Vipul kr. Srivastav, Rahul kr. Yadav, RamapukarGon [14] , sprocket side stand retrieves system, Stand stenghning is tested

Cejin Joy, KetanMahorey, AdarshSharma, ArunSahu.[15], Anti-Accident Ignition System  
Stand chain system coordination check.

### 2.3 Review on pollusion sensor :

Salunkhe Karan vishwas [16] , Mq series gas sensor are electronics sensor use to sense pollutants, Pollution can be detected using the sensor

David Gregory.[17] , Air pollution challenge , Air pollution controlled

M A Elliott [18] , Environment safety , Air pollution controlled

Philippe garrigus [19] , Environmental science and pollution research , Air pollution control

Salunke vishwas [20] , Modifications of exhaust system of two wheeler for emissions control , PUC feasibility in exhaust is check

Thakur Mukesh [21] , Reduction of pollutants emissions , Complete tested the exhaust using PUC

Xiao Liu [22] , Gas sensing technology, MQ7 sensor feasibility

N k saikhedkar [23] , Atomic activity of nanoparticles for vehicular pollution control , Nanoparticles theory is check in exhaust system

R k Sharma [24] , Electron relay effect in catalytic activity , Removal of catalytic nanoparticles which are hazardous for human life

Silva C. M. [25] , Evaluation of S.I. engine exhaust gas emissions , Control of rapid exhaust emissions

Twigg M. V [26] , Role of catalytic oxidation in control of exhaust emission , Through study of exhaust by catalytic converter

## CONCLUSION AND FUTURE SCOPE :

In this project, we have created a working model and successfully integrated the three parts of a two-wheeler which are responsible for the safety of the rider. We have presented automatic side stand retrieval system, smart helmet and a pollution indicating device. The side stand retrieval system is directly integrated with the smart helmet which ensures that the rider has to wear the helmet if he has to start the two-wheeler. This integration makes sure that the side stand, which is responsible for around 36% of the accidents, is lifted as soon as the helmet is worn and the ignition is turned on. Also, the pollution indicating device shows whether the two-wheeler is fit to be driven and is under the pollution norms. This ensures the safety of humans as a whole as it helps in reducing the amount of pollution and thereby leading to lesser global warming problems. It also saves the work of the rider for getting PUC certificate. At present, the automobile industry is using indication for side stand retraction and warning signs for the rider to wear helmets. There is a vast scope for research in this field as just the indication is not enough to ensure the safety of the rider since most of the time these warnings are ignored. The efficiency is reduced because of the sprocket used for the retrieval of the side stand. So more research needs to be done to keep the efficiency intact or even higher if possible.

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