

System to Avoid Road Accidents (Due to Dazzling, Foggy and Hazy Weather Conditions)

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Abstract:- The automated headlight management solution described above offers a novel approach to counter the challenges posed by glare from oncoming vehicle headlights during nighttime driving. This glare can potentially result in temporary visual impairment and heighten the risk of accidents. The proposed system's core function involves adjusting the brightness of the vehicle's headlights based on the intensity of light originating from the oncoming vehicle. By doing so, the system aims to effectively mitigate this issue and bolster road safety. Solar panel is used to detect the high beam from the opposite vehicle. Pothole causes a dangerous situation during driving. Due to weather conditions, bad construction and too much weight of vehicles the roads are getting broken. During the construction of bridges or dividers or other such construction, it has been observed usually that the workers dig many large holes for the pillars that many a times specially during fog days (when visibility goes approximately nil) leads to are serious accidents we witness every now and then , specially in our underdeveloped cities and outer areas .The goal of our project is to design a pothole detection system which will assist the drivers to avoid potholes on the roads, by giving them prior information through advanced Electronic system . The system that is to be implemented in electronic base vehicles is designed in such a manner that whenever a pothole will be there in front of the concerned vehicle, the system will detect the same and will automatically control the speed of vehicle that may lead to nil movement of the vehicle. The system consists of ultrasonic sensor , Arduino UNO, Driver IC , LED and buzzer etc.

Keywords:- Headlight, Vehicle, Temporary Blindness, Solar Panel, Pothole , Buzzer.

I. INTRODUCTION

Potholes are a significant concern due to various reasons. Primarily, they pose a substantial threat to both drivers and pedestrians, resulting in potential dangers. In numerous instances, individuals alter the path of their vehicles to evade potholes, which can lead to risky maneuvers. Potholes represent a significant hazard for multiple reasons. Their presence can lead to hazardous situations involving drivers and pedestrians. In many instances, drivers make sudden maneuvers to avoid potholes, which can result in swerving

toward oncoming vehicles or pedestrians on sidewalks. This behavior presents a potential recipe for catastrophe, increasing the likelihood of accidents. When potholes are particularly severe or a vehicle lacks the necessary resilience to withstand the impact, it can lead to loss of vehicle control. This unfortunate outcome has been responsible for car accidents that tragically lead to wrongful deaths. Potholes are essentially depressions in road surfaces, often found in asphalt pavements, formed as a consequence of traffic displacing fractured sections of pavement. They usually emerge due to water affecting the underlying soil structure, with passing traffic exacerbating the deterioration of the inadequately supported asphalt surface. Over time, this process results in the ejection of both asphalt and underlying soil material, forming a hole in the pavement. In India, roads hold a pivotal role in the transportation landscape, with potholes being particularly prevalent in urban areas, especially on city streets. However, these problematic depressions can emerge on various types of roadways, including highways and rural roads. Potholes are a familiar concept to most drivers, as they've likely encountered these disruptions while driving through cities, neighborhoods, highways, and more. Unfortunately, these encounters usually don't evoke positive memories for drivers. The implications of encountering potholes are significant. Vehicles can sustain serious damage, leading to costly repairs. Moreover, drivers must navigate dangerous situations as they attempt to avoid these depressions or cope with loss of control following impact. Addressing the issue of potholes is crucial for ensuring road safety and the well-being of both drivers and pedestrians.

The intense high beam emitted by vehicle headlights can create perilous situations during nighttime driving. This glare-induced temporary blindness for drivers poses a significant risk of collisions and accidents. Even pedestrians crossing the road can be at risk. It's noteworthy that approximately 30% of accidents can be attributed to headlight glare. Headlights are an essential aid for drivers navigating in the dark, yet these very lights can sometimes lead to discomfort or annoyance for oncoming traffic. When a vehicle's headlights are in high-beam mode, the associated bulb emits a powerful light that has the potential to momentarily blind those in its path. This becomes particularly hazardous when drivers are faced with blinding light from opposing vehicles. During nocturnal travel, the blinding effect of high-beam headlights can lead to critical accidents. The intrusion of this intense light into a driver's eyes can compromise peripheral and clear vision. Drivers who are

subjected to such glare can mitigate its impact by reducing their speed and maintaining a pace that allows them to react within the scope of their headlights. Slower speeds enable drivers to halt their vehicles promptly upon detecting obstacles outside their headlights' reach.

Furthermore, drivers can avert the direct glare by temporarily shifting their gaze downward towards the right side of the road until the passing vehicle's high beams no longer affect them. Nonetheless, in cases where accidents occur due to the blinding effect of high beams, the responsibility would largely fall on the driver using the high beam headlights from the opposing direction

Advancements in car technology have led to the rapid evolution of safety features. While conventional safety elements like airbags and seatbelts remain standard, newer features such as forward collision warning, automatic braking, and automatic switchable high beam lights are becoming more widespread. The integration of sensors and advanced features contributes to vehicle maintenance and enhances passenger comfort through amenities like heated seats and cushioning.

In conclusion, addressing the issue of blinding high beams is crucial to ensuring road safety for all stakeholders, and as technology continues to advance, incorporating innovative safety measures becomes increasingly important.

II. LITRATURE SURVEY

According to the research paper automatic headlight controlling of vehicle and dazzling in night they used LDR (Light Dependent Resistor), Phototransistor. The Demerit of these research paper is that the sensitivity of those project is very low that when the vehicle come very close to each other, the headlight gets trip. We use Solar Panel as a sensor which make the tripping more sensitive and responsive at low light too. Our sensor needs less light for tripping low that the tripping will happen from a long distance.

According to the research paper road pothole detection using ultrasonic sensors they detect the potholes and give prior warning and display the warning and some of them needs fast interconnectivity to detect the potholes but our project does not need any internet connection. Our project detect the potholes with the help to Ultrasonic sensor and control the speed of the vehicle. When the pothole detect by our advance electronic system the car decrease the speed itself and stop at the certain distance from the pothole.

III. METHODOLOGY

The goal of our project is to save the lives of many people by decreasing the percentage of Road accidents (due to Dazzling, Foggy and Hazy weather conditions).

We design a automatic high beam light tripping system which will avoid the accidents due to dazzling during night, by switching off the high beam light automatically. The system that is to be implemented in electronic base vehicles is designed in such a manner that whenever any vehicle come in front of the other vehicle, the high beam light of the vehicle automatically off and when the vehicle passes each other then the high beam light automatically on.

This project helps to automatically control the headlight ON and OFF in motor vehicles. Solar panel is used. Transistor is used. Relay is used for ON and OFF the High Beam Light falling on the opposite vehicle. When driving on deserted city streets, country roads, or highways during the hours of darkness, many drivers use high beams. These high beams many a times can cause risk to drivers by dazzling them which may lead to an accident (for example, a head-on collision can happen). If a person forgets to dip their lights then the blinding beam (along with the lack of general light around you due to it being dark) will make it hard for you to see where you are driving. The goal of our project is to design an auto trip headlight system which will assist the drivers from being dazzled, by switching off the main headlight (high beam light) through advanced Electronic System. Through the designed system, during night, whenever the vehicles come in front of each other, the main headlight (high beam light) of vehicle will automatically turn off. The system consist of Relay, Transistor, Solar Panel, LED etc. When a high beam falls on the surface of Solar Panel, the information passes to the Transistor. Transistor send the information to the to the Relay. The High Beam Light became OFF and the Lower Beam Light remains ON and provides a great relief for the driver from the irritating situation that occurs during the night driving.

We design a pothole detection system which will assist the drivers to avoid potholes on the roads, by giving them prior information through advanced electronic system. The system that is to be implemented in electronic base vehicles is designed in such a manner that whenever a pothole will be there in front of the concerned vehicle, the system will detect the same and will automatically control the speed of vehicle that may lead to nil movement of the vehicle. Pothole causes a dangerous situation during driving in odd weather conditions (Foggy and Hazy). Due to odd weather, when visibility drops to 180m (in fog and haze conditions), it becomes hard for one to see any of the obstacles in path. The goal of our project is to design a pothole detection system which assist the drivers in avoiding potholes on the roads, by giving him prior warnings. Warning can be like a Buzzer or Led. This Project automatically control the speed of the vehicles and apply the breaks at the certain distance from the pothole. When the pothole come in front of

the vehicle then ultrasonic sensor sense the potholes and send the signal to Arduino UNO and then Arduino UNO activates the Led and Buzzer due to which driver will be alert as well as the speed of the vehicle is control automatically and also apply the break at the certain distance from the Pothole.

Potholes are a terrible thing to have for many reasons. Firstly, they are down right dangerous to drivers and pedestrians. Many times people will swerve their vehicles in an attempt to avoid potholes. This leads to them swerving towards cars and trucks in the opposing lane, or towards pedestrians the side walk. Either way it is a recipe for disaster. when a pothole is so severe, or your car is not equipped to handle the blow, it will cause you to lose control of your car. This leads to car accidents that, many times, have caused wrongful deaths. Fast forward to today and car technology is advancing so quickly it can be hard to keep up. Safety features such as airbags and seat belts are standard, but new features such as forward collision warning and auto braking are becoming mainstream. Likewise, numerous sensors, bells, and whistles help us keep our machines running smoothly and cushions or heated seats help us ride in comfort on any journey. We design a pothole detection system which will assist the driver to avoid potholes on the roads, by giving them prior information through advanced Electronic system. Where the Ultrasonic sensor is used to identify the pothole. A buzzer and led is used to alert Driver so that preventive action can be taken to keep away from any adversity. The Pothole detection system is so advance that it will automatically control the speed of the vehicle and afterward automatic breaking system is used. If the Driver is unable to take any action due to panic situation even then we don't need to worry because our advanced Electronic system is capable enough to decrease the speed of the vehicle and later on apply the emergency break.

IV. CONCLUSION

The project highlights the critical issues surrounding potholes and the blinding effects of high beam headlights, both of which pose significant dangers on roadways. Potholes are hazardous not only for drivers but also pedestrians, often leading to risky maneuvers and potential accidents. The presence of potholes increases the risk of accidents and loss of vehicle control, leading to tragic consequences. In India, where road networks play a central role in transportation, addressing potholes is essential for road safety. High beam headlights, while crucial for nighttime driving, can lead to temporary blindness for drivers, increasing the likelihood of collisions. This issue is exacerbated when drivers encounter opposing vehicles with blinding high beams. The discomfort and danger caused by high beam glare contribute to accidents, emphasizing the importance of finding solutions to mitigate such risks.

The project acknowledges the significance of these challenges and introduces potential solutions. By designing a pothole detection system, you aim to alert drivers in advance and even automatically control vehicle speed to prevent accidents caused by potholes. Similarly, your automatic high beam light tripping system aims to reduce the danger of dazzling headlights and promote safer driving conditions during nighttime. Advancements in vehicle technology, like automatic braking and switchable high beam lights, underscore the industry's commitment to enhancing road safety. Your project aligns with these advancements by proposing innovative solutions that address critical road safety issues.

In conclusion, the project tackles two major safety concerns on roadways: potholes and blinding high beams. By introducing technological solutions, you are contributing to the overall safety of drivers, pedestrians, and vehicles on the road. These efforts align with the industry's push toward safer and more advanced transportation systems.

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