|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **THE PATENT ACT 1970 &**  The Patents Rules, 2003  **COMPLETE SPECIFICATION**  (See section 10 and rule 13)  1. **TITLE OF THE INVENTION:**  **A Driving Alert System.**  **2. APPLICANTS:**   |  |  |  | | --- | --- | --- | | **Name** | **Nationality** | **Address** | | Chennai Institute of Technology | An Indian National | Chennai Institute of Technology  Kundrathur,  Chennai- 600 069  Email: principal@citchennai.net | | DR.G.MOHAN BABU | An Indian National | Assistant Professor  Department of Electronics and Communication Engineering  Chennai Institute of Technology  Kundrathur  Chennai- 600 069  Email: mohanbabug@citchennai.net | | Mrs. M.VINOTH | An Indian National | Assistant Professor  Department of Electronics and Communication Engineering  Chennai Institute of Technology  Kundrathur  Chennai- 600 069  Email: vinothm@citchennai.net | | Mr. SARAVANAN A | An Indian National | Department of Electronics and Communication Engineering  Chennai Institute of Technology  Kundrathur  Chennai- 600 069  Email: asaravanan.ece2021@citchennai.net | | Mr. SARANRAJ S | An Indian National | Department of Electronics and Communication Engineering  Chennai Institute of Technology  Kundrathur  Chennai- 600 069  Email:saranrajs.ece2021@citchennai.net |   **3. PREAMBLE TO THE DESCRIPTION**   |  |  | | --- | --- | | **PROVISIONAL**  The following specification describes the invention | **COMPLETE**  The following specification Invention. Particularly describes the invention and the manner in which it is to be performed. |   **4. DESCRIPTION OF THE INVENTION**    Number of vehicles on the road continues to increase, there is a growing need for advanced driving alert systems to enhance road safety. Such systems are crucial for preventing accidents, reducing driver distractions, and ensuring overall road safety. The problem statement is to design and develop an advanced driving alert system that can provide real-time warnings and assistance to drivers in various driving scenario as well as alert the public using LED light.  **BACKGROUND OF INVENTION/ PRIOR ART:**  Alerting the driver with a beep sound using an ultrasonic sensor mounted on the steering is a concept aimed at enhancing driver awareness and safety. In this setup, an ultrasonic sensor is strategically placed on or near the steering wheel to continuously measure the proximity of the driver's hands or any objects in front of the steering wheel. The sensor emits high-frequency sound waves and measures the time it takes for these waves to bounce back after hitting an object. If the system detects that the driver's hands are not on the steering wheel or that an obstacle is too close, it triggers a beep sound as an alert. This beep serves as a reminder to the driver to maintain proper hand placement on the steering wheel and keep a safe distance from the wheel to ensure quick and effective control in case of sudden maneuvers or emergencies. This system can be particularly useful in preventing distracted or careless driving habits and can contribute to overall road safety. Care should be taken to fine-tune the sensitivity of the ultrasonic sensor to minimize false alarms and to provide drivers with a clear and non-distracting alert signal, ensuring that the primary focus remains on safe driving practices.  Creating a system where a voice recognition module captures specific keywords spoken by the driver and activates an LED to alert the public involves integrating various components for seamless communication. This system begins with a voice recognition module, equipped with a microphone and advanced processing capabilities, which listens for predefined keywords or phrases uttered by the driver. These keywords, such as "Emergency," "Caution," or "Stop," serve as triggers. When the module recognizes one of these keywords, it communicates with a microcontroller responsible for controlling the LED display. The microcontroller, often an Arduino or Raspberry Pi, interprets the recognized keyword and generates corresponding LED patterns or messages on the exterior LED display. These patterns are designed to be highly visible and attention-grabbing to alert pedestrians and other drivers about the situation or message conveyed. To provide a user-friendly experience, the system can offer voice confirmation to the driver, letting them know that their command has initiated the LED alert. Additionally, including a manual override option allows the driver to manually activate or deactivate the LED alerts when needed. For safety and regulatory compliance, the system should be designed not to distract the driver or other road users. Rigorous real-world testing is essential to ensure the system's reliability, accuracy in recognizing keywords, and effectiveness in conveying critical messages to the public, ultimately contributing to enhanced road safety.  **Prior Art Statement**  **OBJECTIVES OF INVENTION**  The proliferation of vehicles on the road and the escalating risks associated with modern traffic environments necessitate the development of an Advanced Driving Alert System. This system is designed to harness cutting-edge technology to enhance road safety, mitigate accidents, minimize driver distractions, and ultimately safeguard lives. The primary objective of this project is to create an intelligent and adaptable system that provides real-time warnings and assistance to drivers in diverse driving scenarios.  **Brief description of drawing**  Figure 1 proposed framework for Driver Alert System  Figure 2 proposed framework for Public Alert System.  **DIAGRAM OF INVENTION**  **Figure 1 proposed framework for Driver Alert System**  Yes  Monitor Ultra Sonic Sensor Data  Initialise System  Is Steering Behaviour is careless?  Beep Sound  No  **Figure 2 Proposed Framework for Public Alert System .**  Turn on the LED light  Recognise the keyword  Listen for Voice Commands  Initialise System  **DETAILED DESCRIPTION AND** **SUMMARY OF INVENTIONS**  Creating a comprehensive driver alert system that combines two critical safety features—alerting the driver for careless steering and alerting the public via voice recognition and LED notifications—represents a sophisticated solution to enhance road safety.  **\*\*Careless Steering Alert: \*\***  Firstly, for the driver's safety, an ultrasonic sensor or a similar device is discreetly placed near the steering wheel to continually monitor the driver's steering behavior. This sensor detects instances of careless handling, such as sudden or erratic steering movements, or, more significantly, when the driver's hands are not on the steering wheel when they should be. When such behavior is detected, the system responds by generating a beep sound, effectively warning the driver. This auditory alert serves as a reminder for the driver to maintain a firm grip on the steering wheel, thereby mitigating the risks associated with distracted or reckless driving. Importantly, this system could include a mechanism to confirm that the driver regains control and attention before ceasing the alert, ensuring that the warning is no longer necessary.  **\*\*Public Alert via Voice Recognition and LEDs: \*\***  In parallel, the system integrates a voice recognition module equipped with a microphone and advanced processing capabilities. This voice recognition system is designed to listen for specific keywords or phrases uttered by the driver, such as "Emergency," "Caution," or "Warning." When one of these recognized keywords is spoken, the system springs into action, activating a bright LED display on the exterior of the vehicle. This LED display is strategically placed to be visible to other road users. It can communicate important messages, such as "Emergency Ahead," "Road Closed," or "Slow Down." This visual notification adds an extra layer of safety by promptly informing fellow drivers and pedestrians about potential hazards, urgent situations, or the need to exercise caution.  Combining these two features in a single system offers a holistic approach to road safety. It encourages responsible steering behavior by the driver and minimizes distractions, while also providing real-time, clear, and immediate visual alerts to the public when necessary. Achieving the perfect balance between sensitivity thresholds for steering behavior monitoring, voice recognition accuracy, and LED notification clarity is crucial. Moreover, ensuring compliance with safety regulations and prioritizing the safety of both the driver and the public remains paramount throughout the design and implementation of such a system.  **5. CLAIMS (We claim)**   * The system should not cause additional distractions for the driver. * The system should be cost-effective and affordable for a wide range of vehicles. * The system should be adaptable to different types of vehicles (e.g., cars, trucks, motorcycles). * Consider the limitations of existing hardware and sensor technologies available for integration. * Ensure that the system operates reliably in various weather and lighting conditions. * Comply with all relevant legal and regulatory requirements, including privacy laws. * The combination of voice recognition and LED alerts ensures that information is communicated rapidly. This reduces response times for both the driver and nearby vehicles or pedestrians, potentially preventing accidents or minimizing their severity. * The voice recognition module allows drivers to communicate specific messages or alerts to the system without taking their hands off the wheel or their eyes off the road. This enhances situational awareness and enables drivers to quickly respond to changing road conditions or emergencies. * The LED display system on the vehicle's exterior quickly communicates important messages to other road users. This can be crucial in scenarios like emergency vehicles approaching, construction zones, or sudden road closures, enabling drivers to react appropriately and safely. * By alerting drivers and the public to changing road conditions or emergencies, the system can contribute to more efficient traffic management, helping to prevent gridlock and reduce the risk of secondary accidents. * As technology evolves, the system can be updated and integrated with emerging safety features, such as autonomous driving systems and vehicle-to-vehicle communication. * The led light system can be worked automatic in crucial or emergency situation and it can be activated using the manual switch .   **ABSTRACT OF THE INVENTION**  The integration of a comprehensive driver alert system that combines two crucial safety mechanisms—alerting the driver for careless steering and using voice recognition and LED notifications to alert the public—represents a significant advancement in road safety and communication. This multifaceted system addresses driver behavior and public awareness simultaneously, offering a multitude of advantages.  Starting with the driver-focused aspect, the system employs sensors, such as ultrasonic sensors, discreetly placed near the steering wheel to continuously monitor the driver's handling of the vehicle. When instances of careless steering are detected, such as moments when the driver's hands are off the wheel or sudden erratic movements occur, the system reacts by emitting a distinct beep sound. This audio cue serves as an immediate reminder for the driver to regain proper control of the vehicle, effectively mitigating potential risks linked to distracted or reckless driving. Importantly, the system may include mechanisms to ensure the alert is ceased only when the driver regains attentiveness, further enhancing road safety.  Concurrently, the system incorporates a voice recognition module equipped with a sensitive microphone and advanced processing capabilities. This module is primed to listen for specific keywords or phrases spoken by the driver—keywords that may include "Emergency," "Caution," or "Warning." Upon recognition of one of these defined keywords, the system activates a prominent LED display on the exterior of the vehicle. Positioned strategically for visibility to other road users, this LED display effectively communicates critical messages like "Emergency Ahead," "Road Closed," or "Slow Down." This instantaneous visual notification provides an extra layer of safety by promptly informing fellow drivers, pedestrians, and cyclists about impending hazards, urgent situations, or the need for heightened vigilance.  The amalgamation of these two features results in a holistic approach to road safety. It encourages responsible driving behavior by alerting the driver to their steering habits, thereby reducing distractions and enhancing attentiveness. Simultaneously, it provides real-time, clear, and immediate visual alerts to the public when needed, fostering overall awareness and road safety. Striking the right balance between sensitivity thresholds for steering behavior monitoring, voice recognition accuracy, and LED notification clarity is paramount. Additionally, ensuring compliance with safety regulations and maintaining a focus on the safety and privacy of both the driver and the public throughout the system's design and implementation are crucial. Ultimately, this multifaceted system has the potential to revolutionize road safety, preventing accidents, reducing traffic congestion, and minimizing the impact of emergencies on the road. |
|  |