IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Automatic Smart Speed Breaker Based On VehicleSpeed Using IR Sensor

Chaithrashree[1],Shashank R A[2],Shaik Mubarak[3], Thanush H L[4], Vidya R S[5]

Assistant Professors[1], Students[2,3,4,5]

Department Of Electrical and Electronics Engineering1[1,2,3,4,5]

Vidya Vikas Institute of Engineering and Technology[1], Mysore, Karnataka, India.

Abstract: The project's idea is that there will be an automated speed breaker on time demand and emergency vehicles as needed. Means when the speed breaker is not required on the highway, it disappears and the road gets smooth. When necessary, the breaker comes from the ground and starts to operate at slowing vehicle speed. We use a hemi-cylindrical sheet metal breaker that is connected to the traditional screw jack to apply the principle. Therefore, when necessary, it is rotated in the direction of the clock and rotates in the direction of the anti-clock and is flat and combines with flat road when required. In this device, we use a transmitter and receiver for radio frequency. The emergency vehicle identification device. Keypad is used to manually control the configuration of the speed breaker. The internet of things will be best at this project, which enables the control of the speed breaker online portal ASSBs use real-time vehicle speed data to modify the height and profile of speed breakers, enable the speed breaker with a servo motor, and update information to an Internet of Things (IoT) server. The goal of an ASSB is to control vehicular speed, reduce accidents, and provide an adaptive approach to traffic calming It is expected that if such a device is designed and incorporated into our cars as a road safety device, it will reduce the incidence of accidents on our roads and various premises, with subsction in loss of life and property. When itequentredu comes to the use of a motor vehicle, accidents that have occurred over the years tell us that something needs to be done about them from an engineering point of view.

***Index Terms*–IR Sensor, ESP32**

I. INTRODUCTION

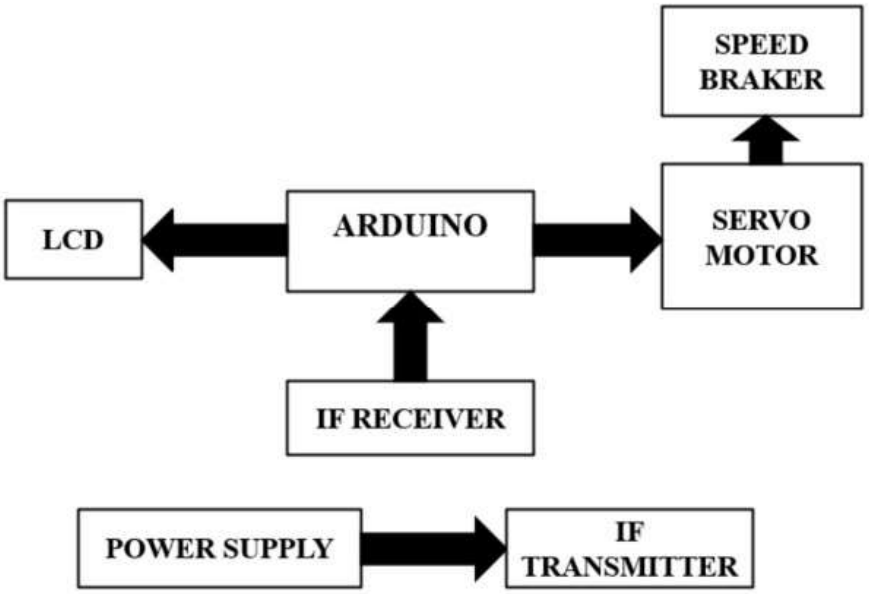
India has the world's second largest road network as a developing country. Almost 97,991 km was provided by national highways over a total length of 5 million km of road network. Because of its sheer magnitude, the Indian government already faces a great challenge to provide a world class path. A person on average spends from 30 to two hours a day driving anywhere. That's about 360 hours in one year. Imagine what type of stress the individual places on his body and unnecessary burden. Given all this, roads are India's biggest mode of transport. Nearly 90% of transport by passenger and industry is done through roads. The fast-growing population raises traffic, and good traffic management is very necessary for safety and also decreases travel time. The solution that is now available every day and that is widely used is a nice, but not the best solution. In short, all vehicles are collectively liable and the path dangerous or accessible. When heavy cars and small vehicles are slowed down, more time is needed to regain their previous speed by vehicles as traffic increases. Slow-speed cars also get shocks and noise that they are not deserving of. Internet of Things (IoT) is now a critical subject in the technology industry, software engineering,policy and has become important news in both print media and social media. This technology is implemented in a wide variety of networked devices, systems and sensors using advancements in

computing power, declining electronics, and networks to manage original competences that are not possible previously. Day by day new topics and analysis on IoT issues abundance of conferences, studies and articles and discussion of the IoT uprising's potential influence from new technology openings and business innovations main concerns about security, privacy.

II. OBJECTIVES

a) Accurate Speed Detection: To design an IR sensor-based system that accurately detects and measures the speed ofapproaching vehicles.
b) Real-time Speed Control: To develop an automatic smart speed breaker system that adjusts its height or firmness in real-timebased on the detected vehicle speed.
c) Enhanced Road Safety: To reduce the risk of accidents caused by speeding vehicles by enforcing speed limits through anintelligent speed breaker system.
d) Traffic Flow Optimization: To optimize traffic flow by adjusting the speed breaker's height or firmness to minimizecongestion and reduce travel times.
e) Driver Behavior Analysis: To analyze driver behavior and identify patterns of speeding, aggressive driving, or other unsafepractices.
f) Low Maintenance and Cost-Effective: To design a system that is easy to install, maintain, and repair, with minimaloperational costs.
g) Weather and Lighting Condition Adaptability: To ensure the system functions accurately in various weather and lightingconditions.
h) Vehicle Classification: To classify vehicles based on their speed, size, and type to provide differentiated speed limits or alerts.
i) Data Analytics: To collect and analyze data on vehicle speeds, traffic volume, and other relevant metrics to inform trafficmanagement decisions.
j) Scalability and Integration: To design a system that can be easily scaled up or integrated with existing traffic managementinfrastructure and systems.

III. METHODOLOGY



IV. IMPLEMENTATION

i) ESP32:

Its a highly versatile microcontroller that can be used for a wide range of applications, from simple DIY projects to complex industrial automation systems. Its built-in Wi-Fi and Bluetooth capabilities make it easy to connect to the internet and communicate with other devices.One of the key advantages of the ESP32 is its low power consumption, which makesit perfect for battery-powered devices. It also has a range of power-saving features, such as sleep modes and dynamic voltage scaling, which can help to extend battery life. The ESP32 is also a very affordable microcontroller, with a typical price range of $5-15 per unit, depending on the specific model and features. This makes it an attractive option for hobbyists and makers, as well as for commercial applications where cost is a factor. In addition to its technical features, the ESP32 also has a large and active community of developers, which can be a big help when it comes to finding resources, documentation, and support. There are also many development boards and modules available for the ESP32, which can make it easy to get started with a project. Overall, the ESP32 is a powerful, versatile, and affordable microcontroller that is well-suited to a wide range of applications, from simple DIY projects to complex industrial automation systems.

ii) Sensors:

An IR sensor, or infrared sensor, is an electronic device that detects and measures infrared radiation emitted by objects in its surroundings. It works by converting the infrared radiation into an electrical signal, which can then be interpreted and used to detect motion, measure temperature, or determine the presence of objects. IR sensors typically consist of an infrared LED and a photodiode, which are arranged so that the LED emits infrared radiation and the photodiode detects any reflected or emitted radiation. When an object comes within range, it blocks or reflects the infrared radiation, causing a change in the electrical signal that can be detected and processed by a microcontroller or other electronic device. IR sensors are commonly used in applications such as motion detection, proximity sensing, and temperature measurement, and are often found in devices such as security systems, remote controls, and thermal imaging cameras. They offer a non-invasive and non-contact way to sense their environment, making them a popular choice for a wide range of industrial, commercial, and consumer applications.

iii) Servo motor:

A servo motor is a high-precision electrical motor that uses a feedback mechanism to control its rotation. It consists of a motor, gearbox, and control circuitry, which work together to provide precise control over the motor's rotation. The motor is typically a DC or AC motor with a high torque-to-weight ratio, while the gearbox reduces the motor's speed while increasing its torque. The control circuitry uses feedback from an encoder or potentiometer to precisely control the motor's rotation, allowing for accurate positioning and control. Servo motors are widely used in applications such as robotics, CNC machines, automation systems, RC vehicles, and aerospace engineering, where high precision and accuracy are required. They offer high torque, fast response times, and low power consumption, making them an ideal choice for applications requiring precise control.

a. SOFTWARE TOOLS

The node MCU comes pre-programmed with Lua interpreter, but you don’t have to use it! Instead, you can use the Arduino IDE which may be a great starting point for Arduino lovers to familiarize themselves with the technologies surrounding the IoT. Note that when you use the Node MCU board with the Arduino IDE, it will write directly to the firmware, erasing the Node MCU firmware. So, if you want to back to Lua SDK, use the “flasher” to re-install the firmware.

V. LITERATURE SURVEY

[1]. Asma Farheen,Dr.Raafiya,"Automated speed breaker to Control Speed of Vehicle based on IOT", International Journal of Technical Innovation in Modern Engineering and science", Vol 5 issue 06,2019 June.

[2]. M.SureshR.JonesRexiyaT,K.G.SanthoshR.Vignesh,"A Break Free Path for Ambulance using Speed Breaker", International Journal for scientific Research and Development, Vol 5,2017 June

VI. CONCLUSION

The implementation of automatic speed breaker systems based on vehicle speed using IoT technology represents a significant advancement in traffic management and road safety. This innovative approach leverages real-time data and smart technology to dynamically control vehicle speeds, ensuring compliance with speed limits while enhancing the overall safety and efficiency of urban and rural road networks. Incorporating automatic speed breakers based on vehicle speed using IoT technology is a forward- thinking approach that brings together safety, efficiency, and innovation. By fostering safer driving habits, improving traffic management, and contributing to sustainable urban development, this technology holds the promise of significantly enhancing the quality of life in our communities. As cities continue to evolve and embrace smart technologies, the adoption of such intelligent traffic management systems will play a crucial role in shaping the future of urban mobility.

VII. ACKNOWLEDGMENT

We express our thanks to all our staff members of Electrical and Electronics Engineering department and all those who have directly or indirectly helped us during the project work. We thank our parents for the immoral support and encouragement throughout this work.

REFERENCES

1. https://www.embedded.com

2.https://www.researchgate.net/publication/360074686_SMART_SPEED_BREAKER_TECHNOLOGY_USING_ARDUINO
_UNO_IR_SENSOR

3. https://islproducts.com/designnote/servomotorfundamentals/#:~:text=Positional%20Rotation%20servos%20rotate%20180,on
%2 0its%20range%20of%20motion.

4. https://www.ijraset.com/research-paper/automatic-speed-breaker