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Wheel Defect Detection System

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ABSTRACT: *Wheel defect detection* system is an system that monitors the air pressure, Tier Alignment, Tier Crack, Tier Pressure in real time and alerts the driver as well as server by display and IOT respectively .There are several parameters in vehicle such as drop in tire pressure, un-expected Tire bursting, unexpected tyre puncture, Tier Alignment, This system presents a vehicle monitoring system that reduces number of accidents, improve mileage, braking efficiency, tire inflation, helps in proper handling and maintenance of vehicle. This system is controlled by a Raspberry-pi. All parameters are displayed on the physical interface i.e. LCD Screen and remote interface using IOT.

KEYWORDS: IOT, – Raspberry Pi, Webcam Monitoring, GPS

I. INTRODUCTION

1.1. Aim

1. High speed Vehicle has achieved remarkable development in India and safety monitoring of high speed is becoming an important research.
2. The only scientific solution to natural calamities is development of systems to predict, detect and take preventive measures using recent advancement in technology.

1.2. Scope

1. Wheel defect detection system plays an important role. Parameters in vehicle if not detected or mmonitored can cause serious problems during running of vehicle.
2. The Proposed System Detect Speed of Vehicle, Tier Crack, Alignment, Pressure.
3. This System proposes an idea of using Internet of Things which will extend the operating System.

1.3. Motivation

1. Currently, the Tire Pressure Monitoring System (TPMS) only monitors the condition of a tire pressure. However, there are no particular reactions taking place after the value of its tire pressure is discovered.
2. In fact, the value of a tire pressure determines driving comfort and safety Therefore, this research proposed a method to integrate a TPMS and a Pressure Sensor Base (PSB) with a particular reaction required to check the tire pressure and defect in tires.

1.4. Objective

1. The Objective of project is to design an automated speed detection system which can detect the speed of vehicles and if over-speeding occurs.
2. To design an automated Wheel crack Detection system which can detect the crack of vehicles.



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II. LITERATURE SURVEY

[1] "IoT Based Railway Track Monitoring System Using Ultrasonic Sensor" Prof.S. B. Deokar¹ & TC Dept, JSPM's Bhivarabai Sawant Institute of Technology and Research (W) Pune

High speed railway has achieved remarkable development in China and safety monitoring of high speed railway is becoming an important.

[2] "IoT Based Vehicle Monitoring System.", Jaideep J. Joshi¹, Poonam N. Kakade² Dr. D.G. Bhalke^{E&TC}, JSPM's Rajarshi Shahu College of Engineering, Savitribai Phule Pune University, INDIA, This paper presents a vehicle monitoring system that reduces number of accidents, improve mileage, braking efficiency, tire inflation, helps in proper handling and maintenance of vehicle.

[3] "Design Of Tire Pressure Monitoring System Using A Pressure Sensor Base", Mudrik Alaydrus¹, Agus Dendi Rochendi¹, Muhtar Muhtar² ¹Department of Electrical Engineering, Universitas Mercu Buana Jl. Raya Meruya Selatan, Kembangan, Jakarta 11650 The proposed TPMS has an electronic device unit directly attached to a tire's valve. This unit includes pressure sensors, microcontrollers, Bluetooth transmitters and batteries.

[4] The intelligent TPMS based on vehicular networking technology was developed in the paper, which is a full tire life-cycle tracking service system and provides a new solution for the tire maintenance. The system transmits the monitoring data to the cloud server via the mobile Internet, and digs out the tire pressure and temperature varying pattern, then feedbacks to the users.

The microcontroller MSP430F149 is used as CPU and along with that GPS, Fuel level sensor and RS232 is used for tracking vehicle, fuel level and communication respectively.

[6] The proposed design has unit mounted on stem valve of tire and remains outside the tire it can measure wide range of the pressure. The system has used on board RF receiver along with LCD and keypad for user interface.

[7] Paper presents a real time traffic monitoring system to solve the problem of real time traffic controlling and monitoring. The proposed system provides a new way of traffic control by the better utilization of resources. The traffic administration department can use this real time traffic monitoring information to detect the dangerous situations on the road and thereby react by imposing immediate actions. On the whole IoT will play an important role in traffic monitoring by improving the efficiency of traffic safety and travelling costs.

[8] Article presents a kind of scheme of direct TPMS, introduces the principle of the system. The communication can greatly improve through carefully choosing the RF module. The transmission module has the low power property. The wireless signal transmission is solved by adopting FSK, Manchester coding and CRC checkout. The testing results indicate that the system meets the needs of the real application well. Researches show TPMS has a bright prospect.

[9], paper has developed and implemented a novel traffic system that is capable of monitoring and managing urban traffic. This system is tested with various conditions and is proved to be scalable. The additional vehicle spotting feature makes this system different from the other implementation. The incorporation of IoT into the system makes this as a blend of standard and advanced technologies.

Vehicle owners can track their vehicle from anywhere in the world. The system developed in this paper proves to be reliable and cost-effective.

[10] The main task of our study is trying through the study of driver's driving behaviour and in coordinating with the information provided from the pre-warning system to decelerate the vehicle speed prior to the happening of accident and if accident happens to reduce the damage to the least level.

III. EXISTING SYSTEM APPROACH

2.1. Description in Details

The Existing system gives solution by keeping vital considerations in view. The Tire pressure monitoring systems described in referred papers make use of RS232 and Bluetooth which have drawback of limited operating range. This paper proposes an idea of using Internet Of Things which will extend the operating range.

2.2. Existing system disadvantage

Reduction in size will not affect working of system. And to increase possible no. of systems, the packet size can also be increased. These modifications can be made if this technique is to be launched as a product.

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IV. PROPOSED SYSTEM APPROACH

3.1. Description in Details

Purpose of this these was to design an automatic Crack, Speed, etc Detection and system using sensors to monitor the tire conditions and to fill the air pressure if tire conditions were below the standard. The existence of a prototype wind pressure automation system designed with a Bluetooth system used in the TPMS Pressure Monitoring System) provided simpler design results

3.2. Proposed system Advantages

Increased safety standards in the automotive industry. We can achieve this situation in a number of ways such as adding more sensors to the TPMS (Tire Pressure Monitoring System)

3.3. Proposed system Architecture

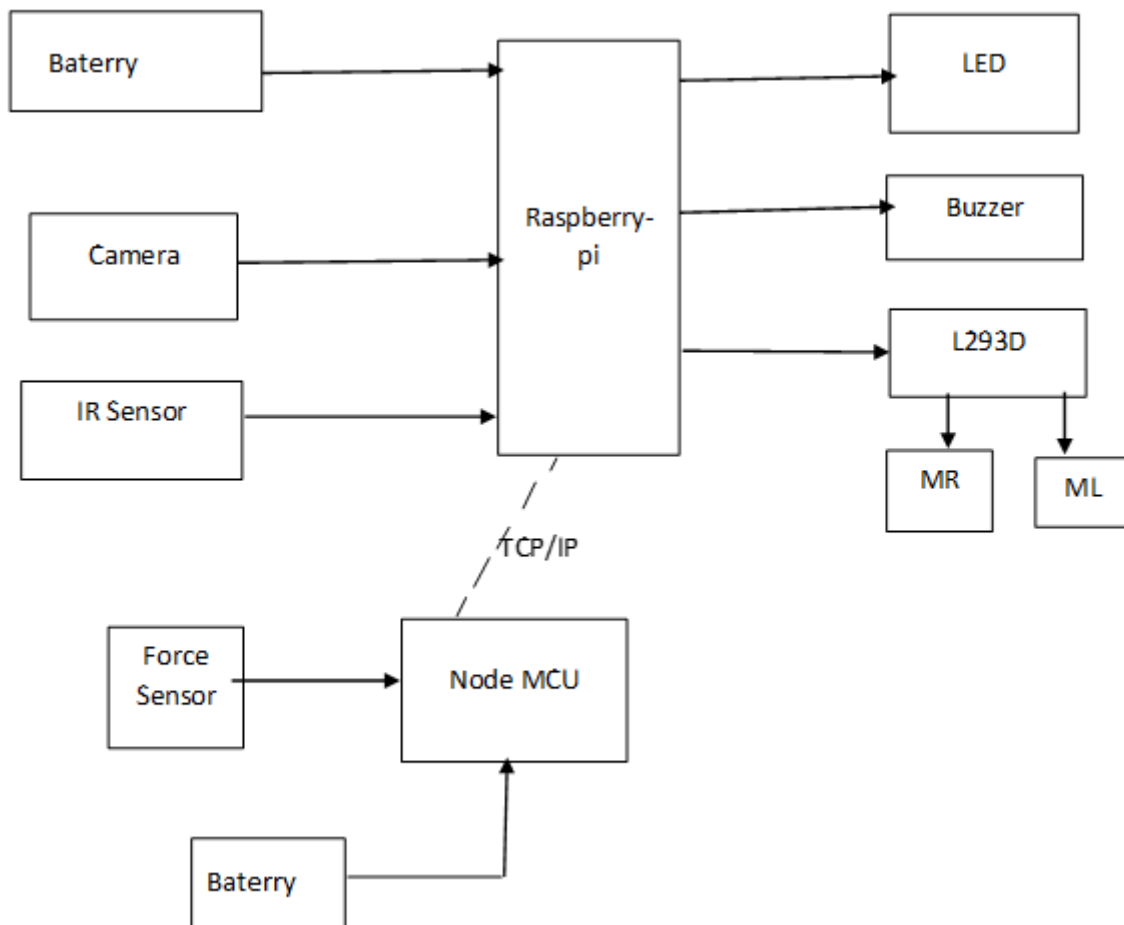


Fig 1: Proposed System Architecture



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V. CONCLUSION

Vehicle force of a wheel under operational speed and output if a wheel has a defect or not. Both methods are trained automatically on measurements gathered from defective and non-defective wheels.

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