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Traffic Data Vertical of Geospatial Data Center

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Abstract : *The main purpose of this project is to develop a measuring device using sensors like Ultrasonic sensor and IR sensor that can be used to determine the number of vehicles and persons passing a point over some specified time. The proposed system consists of ultrasonic sensors, IR sensors and a microcontroller equipped with a knowledge logging shield. the main focus is on counting the large number of individuals and vehicles entering one place. the info received from the measuring instrument is employed to form the studies about the general human number and vehicle. ThingSpeak.com is employed to save lots of the massive recorded data for an extended time for instance , many days and provides results and records about the amount . The proposed system gives accurate results on counting vehicles and persons at bus stops and railway stations. Actual experiments that are conducted indicate that this technique can provides a correct number of vehicles and persons during a given interval of your time.*

Keywords - *Data logging shield, IR Sensor, Measuring Device, Microcontroller, Ultrasonic Sensor*

I. INTRODUCTION

In this paper, we've to gather the traffic data very precisely at different location. Simple data measuring instrument are going to be made so as to gather location specific data of various verticals. The vertical daily data like traffic density on highway also the gang density at stations. This data on day-to-day basis are going to be stored and published on website made by us. This website are going to be open access and act as a knowledge center. we'll be monitor and analysis the info and hence within the future data prediction are often made easy. Electronic devices are capable of replacing human in non-stop duties some typical reasons of why device is more preferable over human is that it can work faster and more reliable because it can't feel tired. Device that's wont to do endless measurement is usually called monitoring system. Such quite device can measure physical information about an object with help of sensors. Vehicle monitoring system is extremely important because it can automatically count the amount of vehicles entering or leaving a neighborhood for counting the density of traffic which can later processed and store and published on website

This paper presents the implementation of an IoT device that has the power to tell what percentage persons and density of traffic at particular location at specific time. This traffic data is stored and published on cloud in order that we will analyze this data with reference to time, festivals, seasons, etc.

II. METHODOLOGY

Traffic data vertical of geospatial data center system proposed during this work is implemented with basic open source microcontroller, ultrasonic sensor, and digital communication channel that transmit the state of traffic to a computing system (server). An Arduino UNO, an HR-SR04 Ultrasonic Sensor, and a laptop were primarily used for the acquisition and processing of the signals captured for this experiment. during this project, the ultrasonic sensor is the signal acquisition device, and therefore the Arduino UNO is the device for processing the signals received from the ultrasonic sensor.

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2.1 Vehicle Tracking System

The ultrasonic sensor is employed to live the space between it and any object that's placed in its line of sound or sight. the thing must be capable of reflecting audio signals for the estimation of the space . Soft surfaces that absorbs sound and rough surfaces which disperses sound signals normally leads to a mistake within the readings of the measurement of the distances. The HC-SR04 used for this experiment is capable of measuring distance between 2 cm to 400 cm. Below fig. shows the diagram of vehicle tracking system.
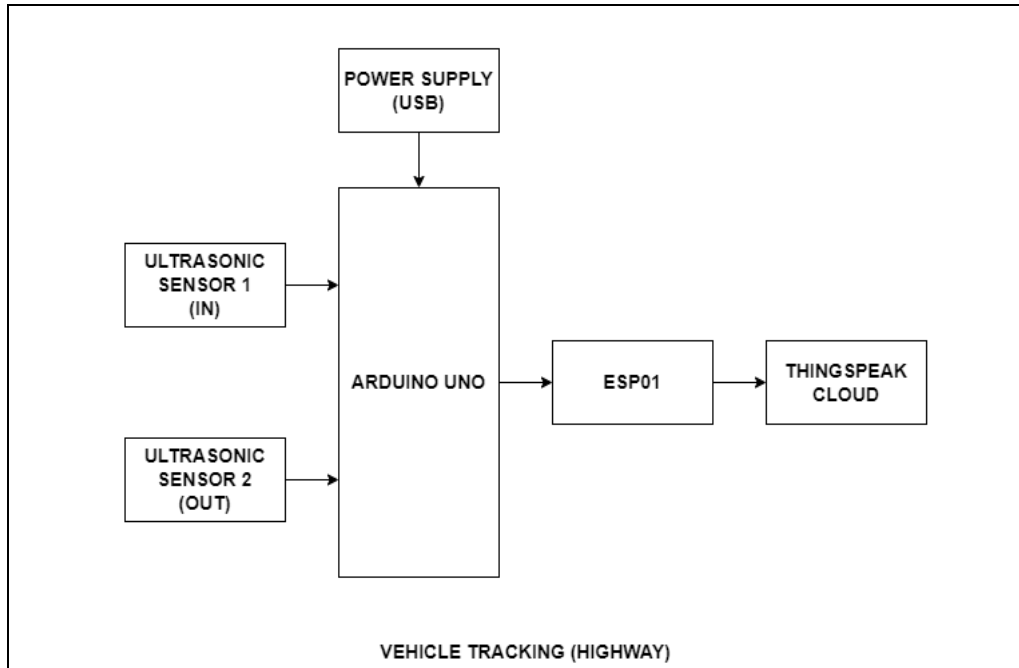

Fig. 1: vehicle tracking system

2.2 Person Tracking System

Similarly, for person tracking or detection the counter system has the ability to detect visitors, entering or leaving at the same time. The system is developed using IR sensors and NodeMCU. IR sensors detect the persons with the help of NodeMCU and data which is detected is send it on cloud where it can be analyzed. Below fig. shows the block diagram of person tracking system.
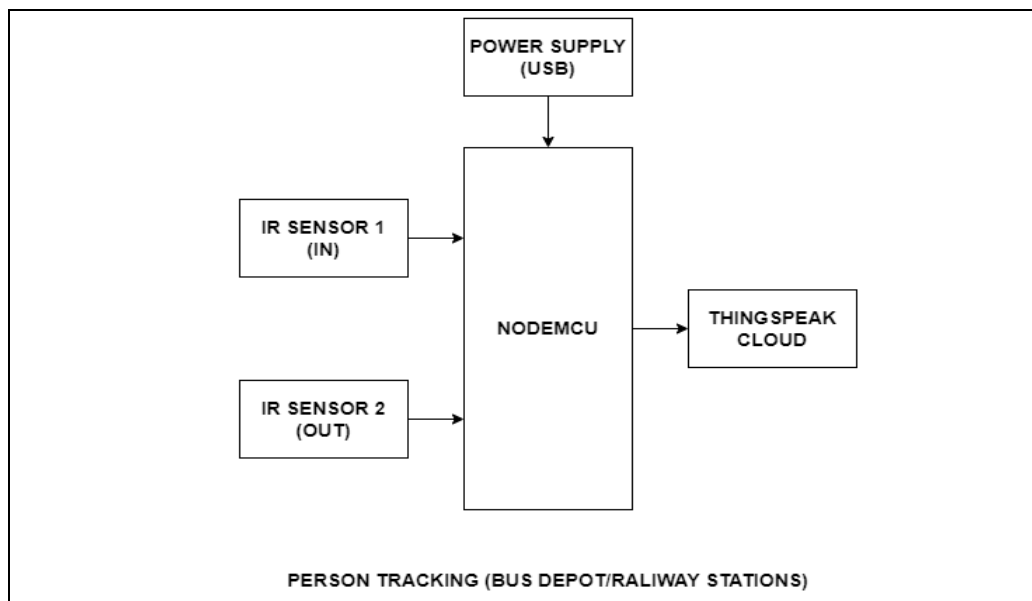

Fig. 2: person tracking system

III.   TABLES

Table. 1: description of components used

Components	Value
1.Arduino Uno R3	
Microcontroller	Atmega328p
Clock speed	32 KB
Input voltage(recommended)	7-12 V
Input voltage(limit)	6-20 V
Digital I/O pins	14
Flash memory	32 KB
2.Ultrasonic Sensor HC-SR04	
Operating voltage	5 V-DC
Operating current	15mA
Operating frequency	40 KHz
Farthest range	4 m
Nearest range	2 cm
Measuring angle	15 Degree
3.IR Sensor LM393	
Detection angle	35 Degree
Distance measuring range	2-30 cm
Dimension	48*14*8 mm
Weight	5 gm
4.NodeMCU	
Memory	128 kBytes
Storage	4 MBytes
Power	USB
Type	Single-board microcontroller

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IV. CONCLUSION

Vehicle and person counting system based on two ultrasonic sensors & IR sensors has been successfully built. The distance between ultrasonic sensors are often varied to regulate the measurement accuracy or to satisfy the user's need. A computer program developed in this research was able to calculate the number of each type of cars & persons passing the detection area in certain interval of time, the number of peaks shown within the graph and therefore the calculation result shown within the vehicle detail window give an equivalent values. By using Ultrasonic and IR Sensors we can measuring devices and by using this devices we can measure the traffic data such as vehicle on highway and crowd at stations gate. After analyzing this data we can create a graph or chart for a particular time so that we can analyses the traffic data at particular season.

This system consists of two main part which are sensing devices and processing unit. Data that has been recorded by system is then analyzed with a computer program.

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