Smart Talkwalker Robot

Prof. C. Senthilkumar[1], P. Saranraj[2], T. Sathishkumar[3], T. Soundharrajan[4], R. Yokesh[5]

[1]Assistant professor, Department of ECE, AVS Engineering College, Salem-3
[2, 3,4,5]UG Students, Department of ECE, AVS Engineering College, Salem-3
---***---

Abstract –*The future world-wide network relies on Internet of Things, based on this Smart Talkwalker Robot plays an important role in media industries through existing IoT. These bots are established for replacing on site visiting of reporters and media personnel at an incident. The main benefit of these bots to reduce manpower and to save lives of reporters in pandemic period, by operating these robots from remote places for collecting data about the incident and causes of incident without delay. At present world, where reporters strives hard for collecting data for their networks. This following project will provide solution for this above problem.*

Keywords: Raspberry pi, Arduino UNO, GPS, GSM, ESP8266, PIR sensor, Pi camera, Relay

1. INTRODUCTION

In present digital dynamic world, data is a powerful tool mainly in media industries. This is also one of mode of communication all over the world. In this advancing technological world day by day tragic incidents has in increased, it is hard to notice over this around a clock. The main objective of this Smart Talkwalker Robot project is to provide accurate information about the incident with low man power and to save lives of reporters from critical pandemic and disasters. This system consists of sensors embedded which collects atmospheric data at incident place and microphone and speaker for much more interactive information collection, where the movement of robot is controlled from remote places.

This system implemented with various sensors such as temperature sensor, moisture sensor and air quality sensor for accurate measure of different parameters at different places at a time. GPS and GSM deployed for being tracked by the user, this also consists of human detection system by using PIR sensor for detection of live human caught into accident/disasters. Hence, the physical and mental health of media personnel is saved.

2. INTERNET OF THINGS (IoT)

`The IoT describes the network of physical objects that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. IoT technology is most synonymous with products pertaining to the concept of the smart home or industrial automation including devices and appliances that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. Where those physical objects are operated over internet remotely.

3. METHODOLOGY

In present scenario, database are essential tool for media industries especially in field of news. 87% of information is covered by reporters. They travels to in place of incident of extract valuable information from it. They strives hard running throughout a clock, including travelling time reduces chance of accurate collection of information. Government buildings consisting environmental monitoring serves a little with static database. It is difficult to reach remote places and restricted regions on time for mining data. Currently, the whole world is wrestling against COVID19, hence arise social difficulties and causing threats to their lives.

Smart talkwalker robot consists of camera, microphone, and audio speaker, various sensors including PIR sensor, GPS and GSM modules etc., which are placed at particular area. When an incident/disaster takes place, receiving this message talkwalker bots of particular region is operated over internet by media personnel. Various sensor provided captures the environmental condition of current atmosphere, camera and mic embedded into it replaces both real ameraman and reporter. This effectively captures/collects information both in-restricted/unrestricted region quickly than that of humans. Talkwalker robot also includes PIR sensor uses in sensing presence of humans caught into tragedy/disaster such as earthquake, coal mining industries etc., Hence those valuable life of reporter is secured and also effective way of information collection is established.

For instance, if a vehicle accident occurs inbuilt GPS tracking system sends message to media department, then Smart Talkwalker Robot of particular incident region is operated over internet, hence time taken to reach and social difficulties are eliminated also obtaining accurate interactive database. If we need to collect information for predicting the results of cyclone for large area these bots are suitable in collecting information that are operated at different regions.

3. HARDWARE REQUIREMENTS

3.1 Raspberry pi

Raspberry PI is a card-sized ARM powered Linux computer development board. There are in total of 5

types of various board with different specification, for the proposed information collecting system Raspberry PI is used. The raspberry pi consists of four USB Ports and one 10/100 Base T Ethernet Socket. Forty pins GPIO Header are present in the raspberry pi board which is used for connecting to Analog to Digital converter chip (MCP3008) to which the sensors are connected. A 5V Micro USB power port is present to which the power supply is given for the device. A HDMI port is present through a which interfacing of the monitor and the Raspberry pi can be done and the USB ports for the keyboard and mouse interfacing. At the bottom a Micro SD Card Slot is provided where the Micro SD card is to be inserted based on the Linux platform.

3.2 Raspberry Pi Camera Module

This 5 megapixels sensor with OV5647 camera module is capable of 1080p video and still images that connect directly to your Raspberry Pi. This is the plug-and-play-compatible latest version of the Raspbian operating system. In terms of still images, the camera is capable of 2592 x 1944 pixel static images, and also supports 1080p30, 720p60 and 640x480p90 video. This camera module is used of information collection and also for navigation purposes.

3.3 Humiture Sensor

This sensor is measurement of temperature and humidity from the incident place or from surrounding environment for predicting climate changes or for evaluating the effects of disaster occurred. DHT11 module which comprises of both temperature and humidity measurement.

3.4 Air Quality Sensor

This is also known as gas detector, where they can be used in detecting combustible, flammable and toxic gases, and oxygen depletion. This type of device is used widely in industry. But in this system this MQT135 sensor is used in remotely controlled robot for information collection of the atmosphere at place of tragic occurred.

3.5 Arduino UNO

The Uno is a microcontroller board based on the ATmega328P. It has 13 digital input/output pins (of which 6 can be used as PWM outputs), 6 Analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. Differences with other boards: The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.
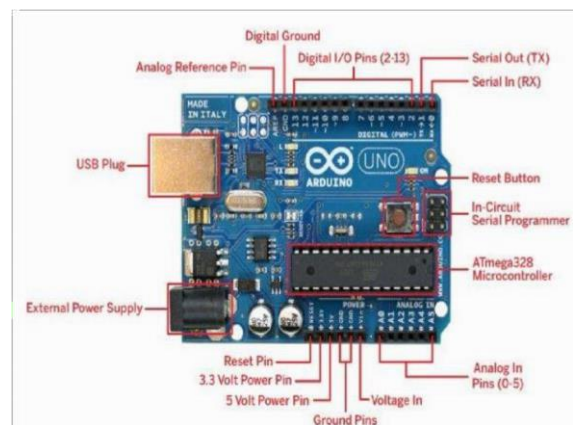
3.6 PIR Sensor

The Passive Infrared (PIR) sensor is used to detect the presence of human. This measures infrared light emitted from objects that generate heat, and therefore infrared radiation, in its field of view. Hence, it intimates the presence of live humans caught into disasters.

3.7 GPS Technology

GPS (Global Positioning System) is used for tracking the location of talkwalker robot. Since, GPS works in all-weather condition and through out the year. The GPS satellites orbit the earth two times a day and send unique signal to GPS receivers. Then these signals are decoded and exact location is evaluated in terms of latitude and longitude.

3.8 GSM Technology

This Global System for Mobile Communication (GSM) comprises of three systems,

- The Switching System (SS)

- The Base System (BS)

- Mobile Station (BS)

GSM is basically a modem which a SIM is installed and it operates over subscription, by send information for intended receiver.

3.9 ESP8266 Module

ESP8266 is a Wi-Fi module developed Espressif Systems, China. It helps in controlling navigation of the robot over internet from remote places. Hence, provides reliable connectivity over long distance.

4. SOFTWARE REQUIREMENTS

4.1 Raspbian

Raspbian is a Debian-based computer operating system for Raspberry Pi. Raspbian was created by Mike Thompson and Peter Green as an independent project. The initial build was completed in June 2012.The operating system is still under active development. Raspbian is highly optimized for the Raspberry Pi line's low-performance ARM CPUs.

Raspbian is a free operating system based on Debian optimized for the Raspberry Pi hardware. It comes with over 35,000 packages, precompiled software bundled in a nice format for easy installation on your Raspberry Pi.
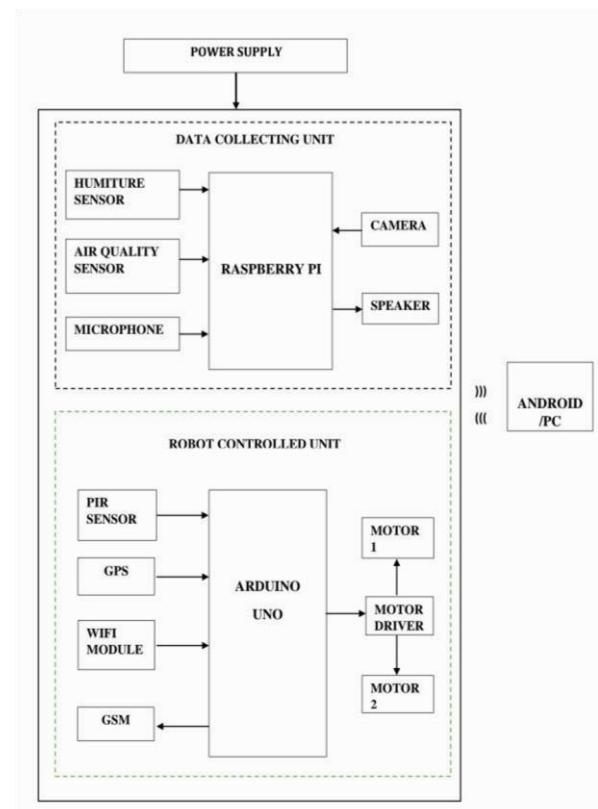
4.2 Arduino IDE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards.

The code is debugged and uploaded using Arduino IDE. Integrated Development

Environment (IDE) for processing

5. BLOCK DIAGRAM

6. CONCLUSIONS

The valuable data plays an important role in predicting accurate results in various situation such as weather monitoring, criminal cases, information of unrestricted areas and so on.

The above project extracts the information for various incident occurred places with low man power. This includes human detection methodology for screening live human at critical stages/places. It is techonological growth towards media for their requirements on data. Since, large amount of robots are involved that made to transfer accurate cause of information in brief time which made a door step solution for the reporters. This above robot is an efficient way to replace people's critical lives.

7. REFERENCES

[1] Shubham R. Vilayatkar, Vaibhav R. Wankhade, Pranjali G. Wangekar, Nikhil S. Mundane (2019).

   Intenational Research Journal of Engineering and Technology on IoT Based Weather Monitoring System Using Raspberry Pi, published on 2019.

[2] Raj Kumar Mistri (2018).

International Journal of Engineering Development and Research on Wi-Fi Controlled Robot Using Node MCU published on 2018.

[3] June Myint Mo Khin, Dr. Nyein Nyein Oo (2018). International Journal of Science and Engineering Applications on Real-time Vehicle Tracking System Using Arduino, GPS, GSM and Web-Based Technologies, published on 2018.

[4] Jessica Saini, Mayank Agarwal, Akriti Gupta, Dr. Manjula R (2017).

International Journal of Scientific and Technology Research on Android App Based VehicleTracking System Using GPS and GSM, published on 2017.

[5] Omar Alsher, Abdullatif Baba, Noori Shaker (2016). The University of Turkish Aeronautical Association Facult of Engineering, EEE Department on Human Detection Robot [ROSHAR], published on 2016.