IOT BASED PATIENT HEALTH MONITORING SYSTEM USING MEDI-ROBOT

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ABSTRACT:

In this project, we propose a robot named Medi-Robot with some functionality of providing medicine as well as to measure the vital parameters (Heart rate and Temperature) of the patient. During the current scenario, reducing the human to human contact in hospitals is required. In a bid to prevent doctors and medical staff from getting affected by Corona virus the role of medicine delivering robots are evolving. We can attain the locomotion procedure of the robot using the principle of Radio-frequency identification (RFID) that automatically identifies and tracks tags attached to the objects. The movement and finding the path to patient location is done through with Bluetooth module to navigate the robot and with RFID tag. To navigate the robot by the help of Bluetooth module and give the commands from the mobile like forward, backward, left, right, stop commands. The robot will move towards the patient's room by following user commands and use RFID cards to identify the patient's room number. Using the vending machine the medicine delivery is made possible to the patients. All the measured parameters will be stored to the cloud using the application of the Internet of Things (IoT). All the data will successfully be sent to the cloud through the Node MCU.

Keywords: Bluetooth module, Heart rate sensor, Microcontroller, Internet of Things (IoT), Radio-frequency identification (RFID).

INTRODUCTION

An embedded device is a machine which is going to do a predefined exact undertaking is the embedded system and is even defined as combination of each software program and hardware. A trendy-reason definition of embedded structures is that they're devices used to manipulate, reveal or assist the operation of device, machinery or plant. "Embedded" reflects the truth that they're an quintessential a part of the system. At the opposite severe a preferred-purpose laptop can be used to govern the operation of a massive complex processing plant, and its presence will be obvious.

All embedded systems are which include computer systems or microprocessors. Some of those laptop systems are but pretty easy structures in evaluation with a personal pc. The very most effective embedded systems are capable of performing fine a unmarried characteristic or set of talents to satisfy a unmarried predetermined motive. In extra complex structures an software program utility that permits the embedded machine to be used for a selected motive in a specific software determines the functioning of the embedded system.

## MODERN USES OF THE HARVARD ARCHITECTURE:

The principal advantage of the pure Harvard architecture - simultaneous access to more than one memory system - has been reduced by modified Harvard processors using modern CPU cache systems. Relatively pure Harvard architecture machines are used mostly in applications where tradeoffs, such as the cost and power savings from omitting caches, outweigh the programming penalties from having distinct code and data address spaces.

VON-NEUMANN ARCHITECTURE

A computer has a unmarried, common memory area in which each application instructions and facts are stored. There is a unmarried internal facts bus that fetches both instructions and records. They can't be finished at the identical time
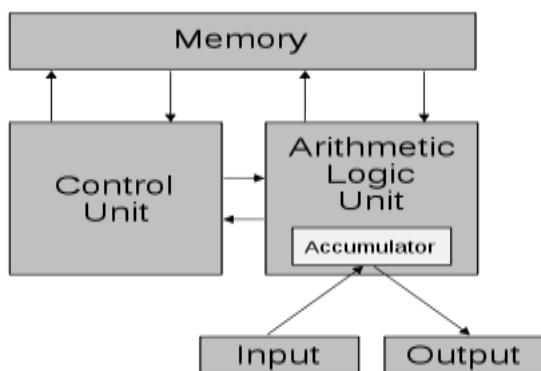
Figure 1 Schematic of the Von-Neumann Architecture.
Proposed Scheme
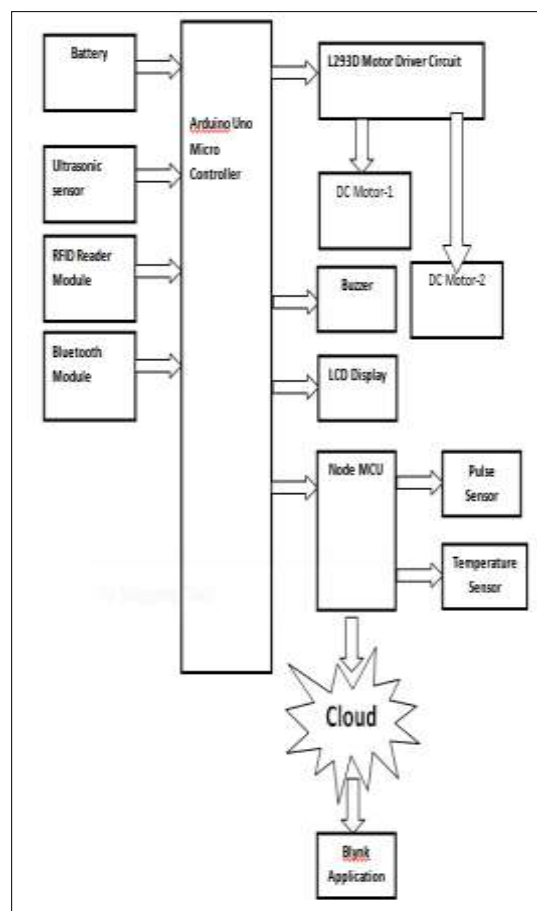
OVERVIEW: ARDUINO UNO

Arduino Uno is a microcontroller board based on 8-bit ATmega328P microcontroller. Along with ATmega328P, it consists other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller. Arduino Uno has 14 digital input/output pins (out of which 6 can be used as PWM outputs), 6 analog input pins, a USB connection, A Power barrel jack, an ICSP header and a reset button.

- **Serial Pins 0 (Rx) and 1 (Tx):** Rx and Tx pins are used to receive and transmit TTL serial data. They are connected

with the corresponding ATmega328P USB to TTL serial chip.

- **External Interrupt Pins 2 and 3:** These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value.
- **PWM Pins 3, 5, 6, 9 and 11:** These pins provide an 8-bit PWM output by using analogWrite() function.
- **SPI Pins 10 (SS), 11 (MOSI), 12 (MISO) and 13 (SCK):** These pins are used for SPI communication.
- **In-built LED Pin 13:** This pin is connected with an built-in LED, when pin 13 is HIGH – LED is on and when pin 13 is LOW, its off.

- **AREF:** Used to provide reference voltage for analog inputs with analogReference() function.
- **Reset Pin:** Making this pin LO
- W, resets the microcontroller.

2.1 Arduino Uno to ATmega328 Pin Mapping

When ATmega328 chip is used in place of Arduino Uno, or vice versa, the image below shows the pin mapping between the two.
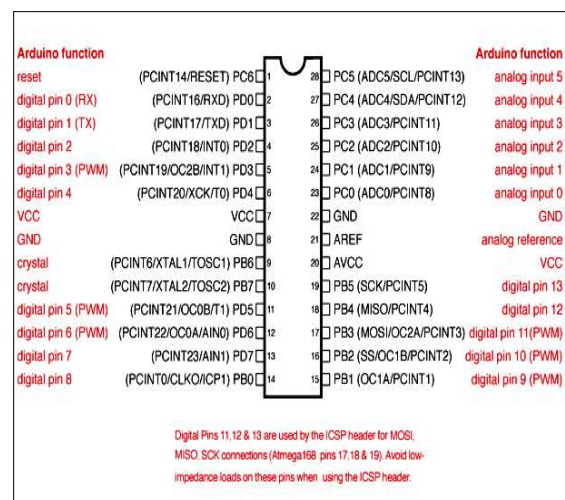
SOFTWARE

Arduino IDE (Integrated Development Environment) is required to program the Arduino Uno board. Download it here.

2.2 Programming Arduino

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);                       // wait for a second
  digitalWrite(LED_BUILTIN, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);                       // wait for a second
```

```
}
```


Applications

- Prototyping of Electronics Products and Systems
- Multiple DIY Projects.
- Easy to use for beginner level DIYers and makers.
- Projects requiring Multiple I/O interfaces and communications.

2.3 ARDUINO IDE

you decided to go and buy yourself an Arduino, but once it arrived, you realized you have no idea what to do with it. Do not panic, for help is at hand! In this how-to, we will look at how to get started with Arduino microcontroller boards. We'll cover software installation, as well as connecting and configuring the Arduino IDE.

You Will Need

- Arduino Uno
- USB B Cable
- Windows 10, Windows 8, Windows 7, Mac, or Linux OS

Be warned, the Arduino gained't constantly be diagnosed automatically. If your Arduino is not recognized. Then uninstall the motive force, dispose of the Arduino, reinsert the Arduino, discover the unrecognized tool, right click on "Update motive force", and then click "Search mechanically". This should fix 99 out of 100 problems.If the Arduino is not recognized, update the driver.
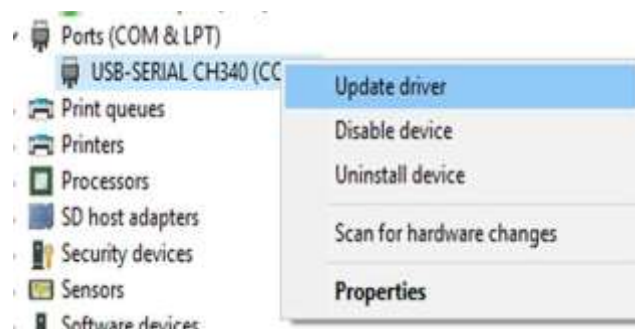
Step 1: Configure the IDE

Now that we have determined the COM port that the Arduino is on, it's time to load the Arduino IDE and configure it to use the same device and port. Start by loading the IDE. Once it's loaded, navigate to Tools > Board > Arduino Uno. However, if you are using a different board (i.e., not the Arduino Uno), you must select the proper board!

Tell the IDE which board you are using.
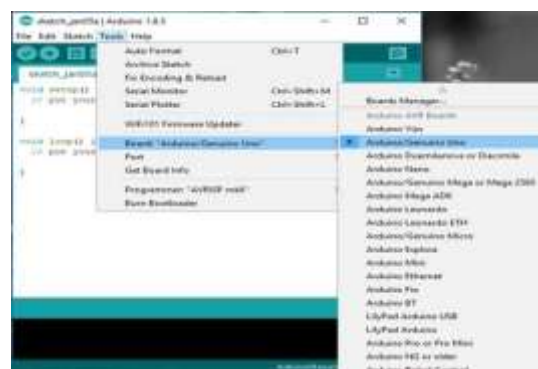
Next, you must tell the IDE which COM port the Arduino is on. To do this, navigate to Tools > Port > COM7. Obviously, if your Arduino is on a different port, select that port instead.

Step 2: Loading a Basic Example

For the sake of simplicity, we will load an example project that the Arduino IDE comes with. This example will make the onboard LED blink for a second continuously. To load this example, click File > Examples > 01.Basics > Blink.

Load the blink example.
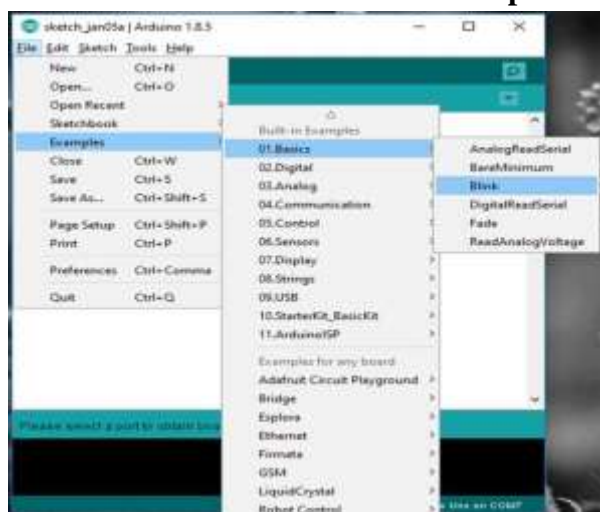
With the instance loaded, it's time to verify and upload the code. The verify level exams the code for mistakes, then compiles the geared up-for-uploading code to the Arduino. The upload degree absolutely takes the binary information, which changed into produced from the code, and uploads it to the Arduino thru the serial port.
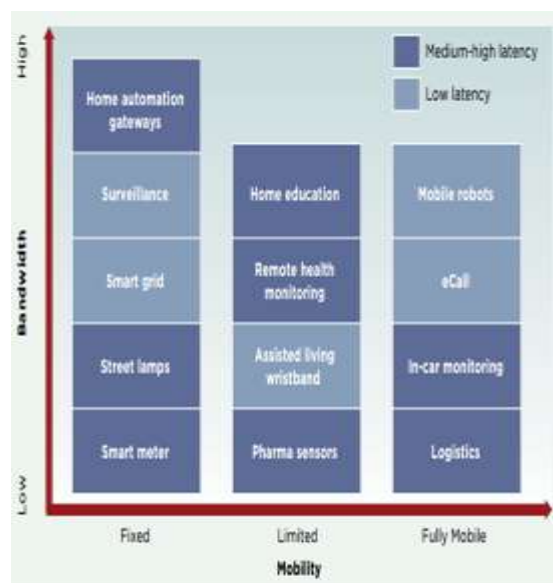
While the capability impact of the IoT is enormous, a concerted attempt is needed to move beyond this early degree. In order to optimise the development of the marketplace, a common information of the

In summary, the IoT will require mobile networks to provide a miles greater different set of talents, at the same time as supplying protection mechanisms for identifying and blockading any application misbehaviour and making certain all different offerings. Mobile operators are running to identify those requirements and develop suitable talents so as to help the good sized range of IoT packages.

APPLICATIONS

Internet of Things enterprise region categories

For customers, connectivity provided by the IoT could decorate their excellent of life in a couple of ways, together with, however no longer restrained to, energy efficiency and safety at home and inside the city. In the home, the mixing of linked clever devices and cloud-primarily based services will help cope with the pressing

issue of electricity efficiency and security. Connected clever devices will allow a reduction in software payments and outages, while additionally enhancing home safety through far off monitoring.

IOT CLEVER CITIES PROGRAMS

In towns, the improvement of smart grids, statistics analytics and independent automobiles will provide an sensible platform to deliver improvements in electricity control, traffic management and protection, sharing the advantages of this technology in the course of society.

IOT HEALTH PROGRAMS

The IoT can even assist widen get admission to and enhance nice of schooling and health. As demand for healthcare doubles8, linked smart devices will help deal with this assignment by way of supporting a range of e-health services that improve access and enable monitoring of chronic diseases and age-related conditions in the home. In doing so, they will improve the quality of care and quality of life for patients, while reducing the strain on the wider healthcare system.

IOT EDUCATION APPLICATIONS

training, cell-enabled solutions will tailor the learning manner to each scholar's needs, enhancing general talent degrees, while linking virtual and physical lecture rooms to make studying extra convenient and on hand. Mobile education solutions have already been shown to improve rookies' proficiency fees and reduce dropout quotes, and feature the ability to enable, by 2017, the schooling of up to one hundred eighty million additional students in developing countries who could be able to stay in faculty due to mEducation

HARDWARE COMPONENTS

This module includes a built-in USB port as well as a plethora of pin-outs.

. **Specification**:

- Voltage:3.3V.
- Wi-Fi Direct (P2P), soft-AP.
- Current consumption: 10uA~170mA.
- Flash memory attachable: 16M B max (512K normal).
- Integrated TCP/IP protocol stack.
- Processor: Tensilica L106 32-bit.
- Processor speed: 80~160MHz.
- RAM: 32K + 80K.
- GPIOs: 17 (multiplexed with other functions).
- Analog to Digital: 1 input with 1024 step resolution.
- +19.5dBm output power in 802.11b mode
- 802.11 support: b/g/n.
- Maximum concurrent TCP connections: 5.

## PIN DEFINITION:
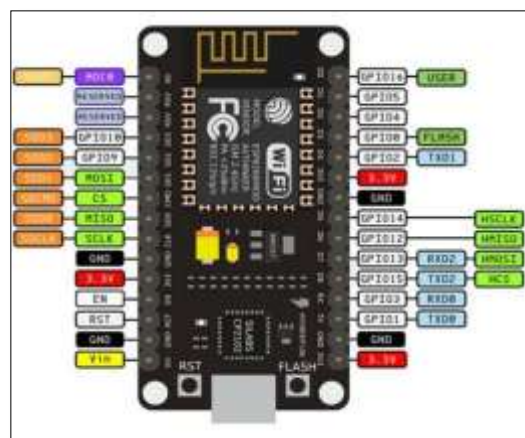
Install the ESP8266 Board Package

Enter **http://arduino.esp8266.com/stable/package_esp8266com_index.json** into Additional Board Manager URLs field in the Arduino v1.6.4+ preferences.

BUZZER

Nowadays, it's significantly more common to employ a ceramic-primarily based piezoelectric sounder, such as a Son warning, which emits a high-pitched tone. In game suggests it is also known as a "lockout device," because while one character signals ("buzzes in"), all others are locked out from signaling. Several game shows have large buzzer buttons that are diagnosed as "plungers".
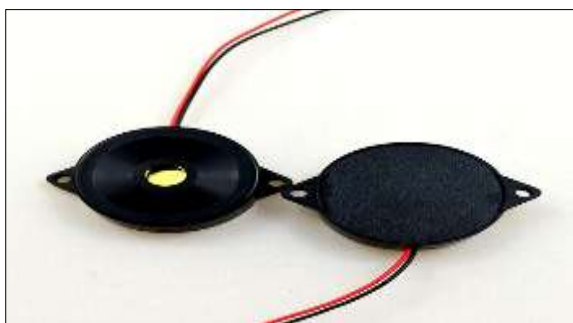
PULSE SENSOR:

Heart beat sensor is designed to give digital output of heat beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

Applications

- Digital Heart Rate monitor
- Patient Monitoring System
- Bio-Feedback control of robotics and applications

Operating Voltage +5V DC regulated

Operating Current 100 mA

Output Data Level 5V TTL level

Heart Beat detection Indicated by LED and Output High Pulse Light source 660nm Super Red LED
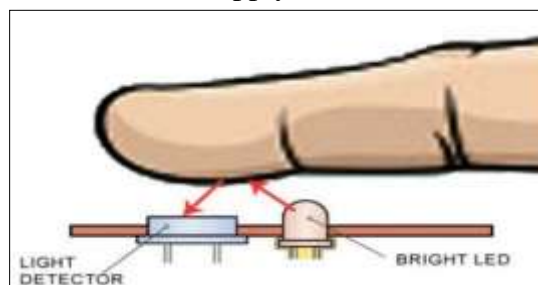
Pin Details

Board has 3-pin connector for using the sensor. Details are marked on PCB as below.

Pin Name Details

1 +5V Power supply Positive input

2 OUT Active High output

3 GND Power supply Ground 2

HUMIDITY SENSOR:

A sensor (additionally referred to as detectors) is a device that measures a measurable characteristic and converts it right into a signal which may be examine by an observer or by using an tool. For example, a mercury-in-glass thermometer converts the measured temperature into expansion and contraction of a liquid which may be study on a calibrated glass tube. A thermocouple converts temperature to an output voltage which may be study by means of a voltmeter.
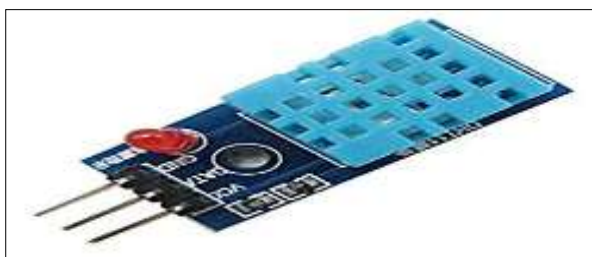
Figure 2 Humidity sensor

SENSOR:

A sensor (also widely recognized as a detector) is a device that measures a measurable attribute and converts it into a signal that an observer or instrument can read. A mercury-in-glass thermometer, for example, converts measured temperature into liquid expansion and contraction, that can then be read on a calibrated glass tube. A thermocouple converts temperature to an output voltage that a voltmeter can read.

TEMPERATURE SENSOR (LM35):

Temperature sensor that converts temperature values into electrical signals. As a temperature sensor, we used an IC called the LM 35. The LM35 series sensors are precision integrated-circuit temperature sensors whose output voltage is proportional to the Celsius temperature. Because it is internally calibrated, the LM35 does not require external calibration. The LM35 requires no external calibration or trimming to achieve typical accuracies of 14°C at room temperature and 34°C over the entire 55 to +150°C temperature range..

Features

- Calibrated directly in ° Celsius (Centigrade)
- Linear + 10.0 mV/°C scale factor
- 0.5°C accuracy guaranteed (at +25°C)
- Rated for full −55° to +150°C range
- Suitable for remote applications
- Low cost due to wafer-level trimming
- Operates from 4 to 30 volts
- Less than 60 µA current drain
- Low self-heating, 0.08°C in still air
- Nonlinearity only ±1⁄4°C typical
- Low impedance output, 0.1 W for 1 mA load

LM35:

➢ LM35 is precision integrated circuit temperature sensor. Its output voltage is linearly proportional to temperature(in celsius).

➢ The LM35 thus has anadvantage over linear temperature sensors calibrated in° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 does not require any external calibration or trimming to provide typical accuracies of ±1⁄4°C at room temperature and ±3⁄4°C over a full −55 to +150°C temperature range
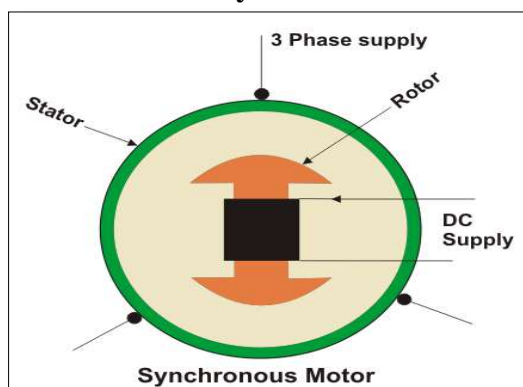
Construction of Synchronous Motor

Figure 3 Synchronous motor

Its construction is almost identica*l* to that of a three-phase induction motor, except that the rotor is powered by a direct current supply, for reasons that will be explained later. Let us first go over the fundamental design of this type of motor. It's indeed clear from the above image how these types of motors are designed. The stator receives three phase power, while the rotor receives direct current power.humming noise and can prevent motor stalling.

MOTOR DRIVER

The L293D embedded device is a dual H-bridge motor driver (IC). Because they take a low-current signal and provide a greater signal, servomotors function as current amplifiers. The motors have been driven through this higher current signal.

L293D includes two H-bridge driver circuits. Two DC motors can be driven simultaneously in both forward and backward direction in its common mode of operation. Input logic at pins 2 and 7 and 10 and 15 can control the motor operations of two motors. Input logic 00 or 11 will cause the corresponding motor to stop. Logic 01 and 10 will rotate it clockwise

and anticlockwise, respectively. To start the motors, enable pins 1 and 9 (corresponding to the two motors) must be high.
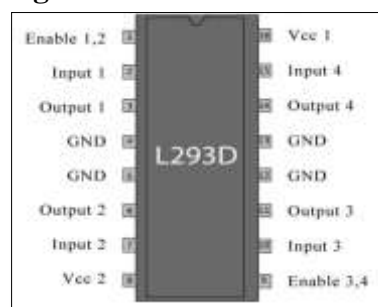

Figure 4 MOTOR

Pin Diagram:

Figure 5 PIN DIAGRAM

Pin Description:

Pin No	Function	Name
1	Enable pin for Motor 1; active high	Enable 1,2
2	Input 1 for Motor 1	Input 1
3	Output 1 for Motor 1	Output 1
4	Ground (0V)	Ground
5	Ground (0V)	Ground
6	Output 2 for Motor 1	Output 2
7	Input 2 for Motor 1	Input 2
8	Supply voltage for Motors; 9-12V (up to 36V)	Vcc 2
9	Enable pin for Motor 2; active high	Enable 3,4
10	Input 1 for Motor 1	Input 3
11	Output 1 for Motor 1	Output 3
12	Ground (0V)	Ground
13	Ground (0V)	Ground
14	Output 2 for Motor 1	Output 4
15	Input2 for Motor 1	Input 4
16	Supply voltage; 5V (up to 36V)	Vcc 1

ADVANTAGES

- Decreased field damaging conditions
- Improved safety and security
- High quality receiving data
- Less power consumption
- High speed data rate

ULTRASONIC DISTANCE MESURMENT

This Rhydolabz "Resonance" Ultrasonic Range Detector is a fantastic product that provides detection and ranging from very close (2CM) to very far (4M). The sensor provides highly accurate non-contact distance measurements ranging from 2cm to 4 metres. Its small size, extended range, and ease of use make it an excellent sensor for distance measurement and mapping. The board is easily interfaced to microcontrollers, with triggering and measurement performed on a single I/O pin. The sensor sends out an ultrasonic wave and generates an output pulse equal to the time it takes for the burst echo to return to the sensor. The distance to the target can be easily calculated by measuring the width of a echo pulse.


Figure 6 ECHO SENSORS

ECHO SENSOR FEATURES

- Professional EMI/RFI Complaint PCB Layout Design for Noise Reduction
- Range : 2 cm to 4 m
- Accurate and Stable range data
- Data loss in Error zone eliminated
- Modulation at 40 KHz
- Mounting holes provided on the circuit board
- Triggered externally by supplying a pulse to the signal pin
- 5V DC Supply voltage
- Current - < 20mA
- Bidirectional TTL pulse interface on a single I/O pin can communicate with 5 V TTL or 3.3V CMOS microcontrollers
- Echo pulse: positive TTL pulse, 87 ^s minimum to 30 ms maximum(PWM)
- On Board Burst LED Indicator shows measurement in progress
- 3-pin header makes it easy to connect using a servo extension cable, no soldering required

FINDING THE DISTANCE

The ECHO sensor emits a short 40 kHz (ultrasonic) wave underneath the control of a host micro - controller (trigger pulse). This burst travels through the air, collides with an object, and then returns to the sensor. When an echo is discovered, the ECHO sensor will send an output pulse to the host (via its signal pin), and the width of this pulse can be used to quantify the

distance to the target
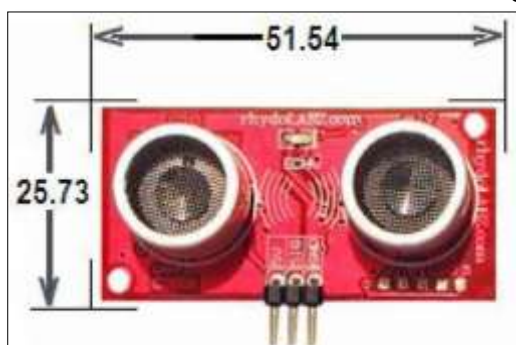
PRACTICAL CONSIDERATION FOR USE

- Object Positioning

The ECHO sensor cannot accurately measure the distance to an object that:

•	Is more than 4 meters away, Fig 1

•	That has its reflective surface at a shallow angle so that sound will not be reflected back towards the sensor (Angle 0 < 90°), Fig 2. or

•	Is too small to reflect enough sound back to the sensor.

In addition, if your ECHO sensor is mounted low on your device, you may detect sound reflecting off the floor.
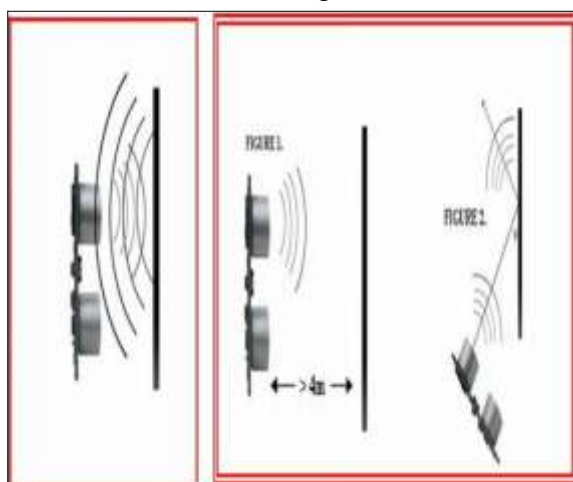
Ideal Case Of Positioning

Figure 7 Target Object Material

Furthermore, objects that absorb sound or have a soft or irregular surface, such as a stuffed animal, may not reflect enough sound to be accurately detected. The ECHO sensor detects the surface of water, but it is not designed for outdoor use or continuous use in wet conditions. Condensation on its transducers may have an impact on the device's achievement as well as lifespan..

BLUE TOOTH

BLUETOOTH

Bluetooth is an open wireless technology standard for exchanging data over short distances (via short wavelength radio transmissions) between fixed and mobile devices, resulting in highly secure personal area networks (PANs). It was established in 1994 by telecom seller Ericsson as a wireless alternative to RS-232 data cables. It can connect multiple devices, overcoming syncing issues.

Bluetooth Overview

Why Bluetooth?

Bluetooth is a short-range radio link that is designed to replace the cable(s) that connect

Bluetooth has a much lower data rate and transmitting variety than HomeRF and the IEEE 802.11 family (10 meter). While HomeRF supports a bit rate of 1.6 10 Mbps and IEEE 802.11a/b supports 54/11 Mbps, Bluetooth only supports 780 Kbps, which can be used for 721 kbps downstream aand upstream asymmetric

data transfer at 57.6 kbps or symmetric data transfer at 432.6 kbps. HomeRF and I both11 have a range of 100 metres, whereas Bluetooth has a range of 10 metres.

Bluetooth, on the other hand, has a much cheaper price per node due to the reduced data rate as well as produce different results (approximately 5% of HomeRF and IEEE 802.11). As a result, it is better suited for applications that require a low data rate (data and voice), a tiny minority of devices (8 at most), low power consumption, and a short range (up to 10 metres), such as PC-to-peripheral networking, home networking, hidden computing, data synchronisation (such as between PC and PDA), mobile phone devices, and future smart devices or entertainment equipment.

BLUETOOTH ARCHITECTURE

The Bluetooth architecture and its relationship to the OSI model

Bluetooth communication takes place between a master and a slave radio. Bluetooth radios are symmetric inside the context that a single device can function as both a master and a slave. Each radio has a fixed 48-bit device address (BD ADDR)..
A Bluetooth network connection can only be initiated by a master. Once a link is established, however, the slave may request a master/slave switch to become the master. Slaves are not permitted to communicate directly with one another. All communication takes place between the slave and the master. Within a piconet, slaves
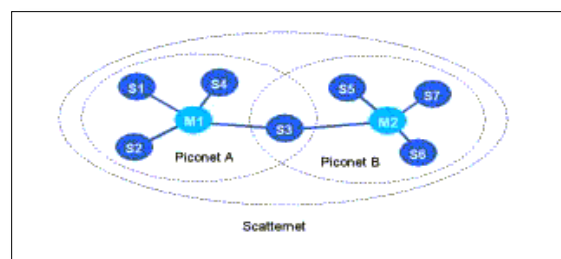

Figure 8 Bluetooth Scatternets and Piconets

A scatternet is made up of multiple piconets with overlapping coverage areas. Each piconet can have only one master, but slaves can participate in multiple piconets at the same time. A device can be a master in one piconet and a slave in another, or it can be a slave in multiple piconets.

Bluetooth Topology

There can be only 2 ~ 8 Bluetooth devices talking to each other. This is called a piconet. Among these devices, there can be only one master device, all the rest are slave devices. A device can belong to two piconets meantime, serving as slaves in both piconet or a master in one and slave in another. This is called a bridging device. Bridging devices connect piconets together to form a scatternet:
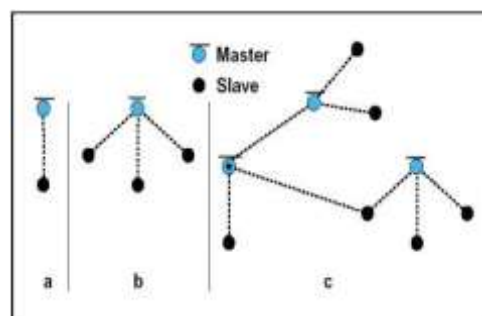
Figure 9 Single-slave piconet (a), multiple-slave piconet and scatternet (c)

RF AND BASEBAND

Bluetooth operates in the 2.5GHz Industrial-Scientific-Medical (ISM) band, which is unlicensed.There are already many types of devices using this band, such as baby monitors and garage door remote controls. TBluetooth devices send out very weak signals to avoid interfering with these devices (about 1 milliwatt). The transmission range is thus limited to 10 metres.

MODULATION

The modulation in Bluetooth is Gaussian Frequency Shift Keying (GFSK), with BT = 0.5 and modulation index between 0.25 and 0.35:
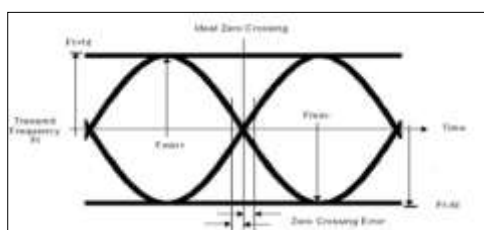

Figure 9 MODULATION

BLUETOOTH MODULATION (GFSK)

PHYSICAL LINKS

Bluetooth protocol uses a combination of synchronous and asynchronous links. A Synchronous Connection-Oriented (SCO) link is a point-to-point link between the master and specific slave. It has symmetric 64 kbps rate, typically used for voice transmission. It uses reserved time slots, thus can be regarded as a circuit switching link. A master can support up to 3 SCO

links to one or multiple slaves, while a slave can support up to three SCO links to one master or up to two SCO links to different masters. Master transmits at reserved master-to-slave time slot, and slave response in the following slave-to-master slot. SCO packets are never retransmitted. Bluetooth protocol employs both synchronous and asynchronous links. A point-to-point Synchronous Connection-Oriented (SCO) link connects the master and a specific slave. It has a symmetric 64 kbps rate, which is typical for voice transmission. It uses reserved time slots and thus functions as a circuit switching link. A slave can also have up to three SCO links to one or even more masters, while a master can have up to three SCO links to one master or up to two SCO connections to various masters. The maestro transmits during the reserved master-to-slave time slot, and the slave reacts during the following slave-to-master time slot. SCO packets are never resent

PACKET FORMAT

Data in piconet is encoded in packets. The general packet format is shown below:

Figure 10 General Packet Format of Bluetooth

Specifications:

Pin	Symbol	Level	Function
1	V$_{SS}$	-	Power, GND
2	V$_{DD}$	-	Power, 5V
3	Vo	-	Power, for LCD Drive
4	RS	H/L	Register Select Signal H: Data Input L: Instruction Input
5	R/W	H/L	H: Data Read (LCD->MPU) L: Data Write (MPU->LCD)
6	E	H,H->L	Enable
7-14	DB0-DB7	H/L	Data Bus; Software selectable 4- or 8-bit mode
15	NC	-	**NOT CONNECTED**
16	NC	-	**NOT CONNECTED**

Even when limited to character-based modules, a wide range of shapes and sizes are available. Standard line lengths are 8, 16, 20, 24, 32, and 40 characters in one, two, and four line versions.

PIN	SYMBOL	FUNCTION
1	Vss	Power Supply(GND)
2	Vdd	Power Supply(+5V)
3	Vo	Contrast Adjust
4	RS	Instruction/Data Register Select
5	R/W	Data Bus Line
6	E	Enable Signal
7-14	DB0-DB7	Data Bus Line
15	A	Power Supply for LED B/L(+)
16	K	Power Supply for LED B/L(-)

Figure 11 Pin specifications

Fixed readers are configured to create a tightly controlled interrogation zone. This allows for a well-defined reading area when tags enter and exit the interrogation zone. Mobile readers can be held in one's hand or mounted on carts or vehicles.

**Figure 12 READER MODULE**

Bulk reading

Bulk reading is a strategy for interrogating multiple tags at once, but it lacks the precision required for inventory control. A group of RFID-tagged objects is read entirely from a single reader position at the same time. Rfid labels with HF (ISO 18000-3), UHF (ISO 18000-6), and SHF (ISO 18000-4) frequencies may be used for bulk reading. However, because tags respond sequentially, the time required for bulk reading increases linearly with the

number of labels to be read. This means that reading twice as many labels takes at least two times as long. The time required is increased due to collision effects...[citation needed]

Electronic key for RFID based lock system

SOFTWARE IMPLEMENTATION

Arduino Uno on the Arduino Desktop IDE If you want to programme your Arduino Uno while not connected to the internet, you must first instal the Arduino Desktop IDE. The Arduino Software (IDE), our Integrated Development Environment that is shared by all of our boards, is used to programme the Uno. Before proceeding, you must have installed the Arduino Software (IDE) on your PC, as described on the home page of our Getting Started section. Connect your Uno board to a computer using an A B USB cable, also known as a USB printer cable.
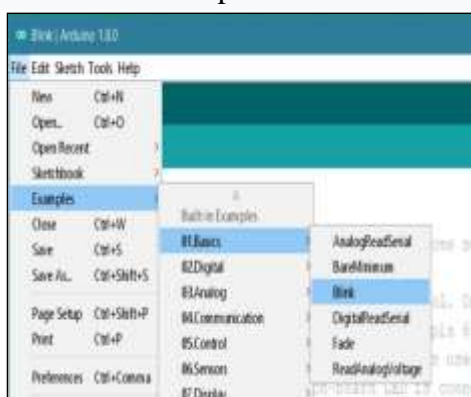
Figure 12 Select the board driver
CONCLUSION

Robotics play a significant part in the global economy and everyday life. Another challenge of robotics research is to be successful and to develop patents according to the complexity of their applications for global industries. The market for robotics technology is rising in a wide variety of applications and human activities, particularly for the

manufacturing, medical, utility, defense and consumer industries. This Bluetooth control and obstacle with edge detecting robot is the prototype of robots for industrial use. This smart and intelligent robot has more benefits because it doesn't consume much power. Our project aims at creating an autonomous robot that intelligently senses the obstacle and the edge in its path. So, what this system provides is an alternative to the existing system by replacing skilled labor with robotic machinery, which in turn can handle more patients in less time with better accuracy and a lower cost. Performance can be improved by using good materials and great sensing power also improves motor movement. The setup cost of the Bluetooth control robot depends primarily on the costly machinery, property, and building and staff around the clock to maintain and use the machinery.

REFERENCES

[1] "Line Follower Robot," Cao Quoc Huy, University UPG din Ploiesti.

[2] Md Mamunur Rashidc, Nakib Hayat, Deloara Khushib, and Chowdhurya. "Algorithm for line follower robots to follow critical paths with the fewest sensors." International Journal of Computer, Volume 24, Number 1 (2017), pp. 13-22.

[3] "Line follower robot: Fabrication and accuracy measurement by data acquisition," F. Kaiser, S. Islam, W. Imran, K. H. Khan, and K. M. A. Islam, 2014 International Conference on Electrical Engineering and Information &Communication Technology, Dhaka, pp. 1-6

[4] A comparative study of gas explosion occurrences and causes in China and the United States, Gao Y., Fu G., Nieto A. International Journal of Mine Reclamation and Environment 2015; 30:269-278. doi: 10.1080/17480930.2015.1043770.

[5] "Autonomous colour line follower robot with obstacle avoidance based on sensors," Mr. K. M. Hasan" K. M. Hasan, A. Al-Nahid, K. J. Reza, S. Khatun, and M. R. Basar, 2013 IEEE Business Engineering and Industrial Applications Colloquium (BEIAC), Langkawi, 2013, pp. 598-603.

[6] Kahe (2007), "AVR Microcontroller," Nas Publication

[7] L. Kasprzyczak, S. Trenczek, and M. Cader developed a mechatronic product for tracking hazardous surroundings. 6:57-64 in J. Autom. Mob. Robot. Intell. Syst.

[8] "Design and implementation of RFID line-follower robot system with colour detection capability using fuzzy logic," 2015 International Conference on Control, Electronics,Renewable Energy and Communications (ICCEREC), Bandung, pp. 75-78...