

Automation Umbrella and Smart Garbage Using IOT

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Abstract:

The smart umbrella not only blocks a rain but also provides a variety of services to customers. Existing smart umbrellas have various features such as giving security from unwanted raining and in summer high temperature. In this paper, we propose new smart umbrella that guides the way to the destination on rainy days, collaborating using user based on the IOT

Keywords— Automation umbrella can be used for protecting sun rays as well as rainfall to save farmers crops from unseasonal rain.

I.INTRODUCTION:

Today, much governance has been aim to implementsmart city usingIOT.According to my point of view, smart city isn't needed because first our nation is needed to develop in rural areas i.e. Villages. At the beginning providesome facility to rural people than after we require smart cities.We survey about village we notice that, there is no system for waste, avoid farmer problems like crops from unwanted rains and traffic's condition is very bad so we decide our paper based on smart village and their needs.

II.GARBAGE MONITORING SYSTEM:

Garbage can consists of the unwanted material leftover industries and household activities. "SwacchBharat Abhiyan" our Prime Minister Narendra Modi,goal-oriented task to make India tidy nation, plans to instruct natives to lessen and even clean their own waste. Ind. This project is related to the "Smart garbage" and based on "Internet of Things" (IOT). So for smart lifestyle, cleanliness is needed, and cleanliness is begins with Garbage Bin. This undertaking we help to limit the refuse transfer or waste issue.The system is remotely checked and controlled by corporation. Furthermore, some Staff is expected to deal with this framework. No individual person isrequired in the Actual place and transport of waste from the accumulation point to the waste station.One of the main environmental benefits is

reduced CO2 emissions. Also traffic is reduced for the importing/exporting daily routine

III. UMBRELLA:

Like lotus flowers, umbrellas are programmed to fold and unfold in manually as well as automatic. Their near-silent operation is automatically aligned with changes in dailytemperature as well as rainy seasons.

In summer, the open umbrellas give daytime shading and mirror the sun radiation energy. Activity is consequently lined up with changes in every day temperature.

IV. PROJECT OVERVIEW:

Our main objective is that, the farmers who have to face adversity during the unseasonal rain, so they have lots of loss. So we are making such a umbrella for multipurpose that the farmer can help our umbrella is such that, whenever the temperature will increased then the umbrella will open automatically and whenever the rain is coming its sense the rain and it will open itself. But the need of water and sunlight is in the field so the farmer can also open and close umbrella sitting at home. As far as the application of umbrella, we can put it in any center of square so that traffic police can escape from the sun and water.

And for garbage system it send the information whether dustbin is full or not.

V. CONSTRUCTION OF PROJECT:

At mega controller consisting 4 ports, one port is used for 16*2 LCD, second port is used for motor to drive umbrella. Third port is used for signal light and next and last for temperature sensor, For the purpose of circuit simulation proteus software is used and for PCB layout express PCB use.

VI. WORKING OF PROJECT:

It consist of mainly node mcu, ultrasonic sensor and at mega controller IC.

For umbrella purpose the 6 volt dc motor 100 rpm is connected to metal rod of umbrella and this motor is connected to at mega controller IC, The operation of umbrella is done by using node mcu. Node mcu is used to open and close umbrella through internet also at mega IC by using temperature sensor its sense the high temperature limit and give the information to motor.

And through motor umbrella is open close. And we also open close by using IoT manually.

For smart garbage using ultrasonic sensor we measure the distance of bin .that is garbage full or not and this information gives to corporation staff through node mcu. Then corporation sending person to clear garbage from dust bin. Now talking about the smart garbage, so it has to do a smart job. So it distribute dry garbage and clay garbage to different dustbin by using sensor and motor.

VII. SOME IMPORTANT COMPONENT LIST:

LIST:

- 1) Node MCU
- 2) At mega 16 micro controller
- 3) Ultrasonic sensor
- 4) 16*2 LCD display
- 5) 6 volt battery
- 6) 6 volt solar panel 300 ma
- 7) 6 volt motor 100 rpm
- 8) LED's
- 9) Metal rod
- 10) Switches
- 11) IC 7805
- 12) Capacitor
- 13) Variable resistor

VIII. PCB LAYOUT:

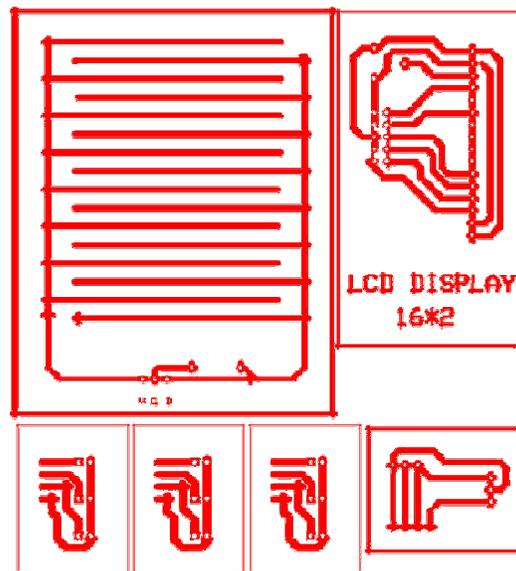
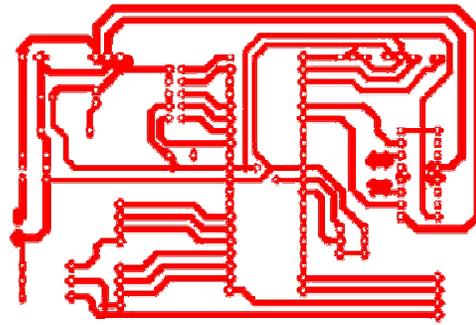


Fig.1 PCB layout

IX. CIRCUIT DIAGRAM

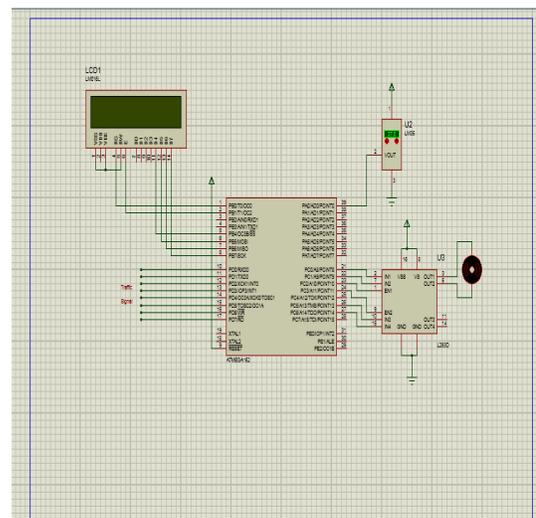


Fig 2.circuit diagram

X. AT MEGA 16 IC CONTROLLER



Fig 3. Atmega ic

It has 40 pin IC and it has 4 ports and each port having 8 bits. That is, it has used to 32 bits input outputsome significant features of at mega controller are following.

XI. Pin Description:

Pin No.	Pin name	Description	Alternate Function
I.	(XCK/T0) PB0	I/O PORTB, Pin 0	T0: Timer0 XCK : USART External Clock I/O
II.	(T1) PB1	I/O PORTB, Pin 1	T1:Timer1
III.	(INT2/AIN0) PB2	I/O PORTB, Pin 2	AIN0: Analog Comparator I/P INT2: External Interrupt
IV.	(OC0/AIN1) PB3	I/O PORTB, Pin 3	AIN1: Analog Comparator Negative I/P OC0 : Timer0 Compare Match Output
V.	(SS) PB4	I/O PORTB, Pin 4	In System Programmer Serial Peripheral Interface
VI.	(MOSI) PB5	I/O PORTB, Pin 5	
VII.	(MISO) PB6	I/O PORTB, Pin 6	
VIII.	(SCK) PB7	I/O PORTB, Pin 7	
IX.	RESET	Reset Pin, Active Low Reset	
X.	VCC	VCC = +5V	supply
XI.	GND	GROUND	

XII.	XTAL2	Output to crystal Oscillator Amplifier	
XIII.	XTAL1	Input to Inverting Oscillator Amplifier	
XIV.	(RXD) PD0	I/O PORTD, Pin 0	Serial Communication Interface
XV.	(TXD) PD1	I/O PORTD, Pin 1	
XVI.	(INT0) PD2	I/O PORTD, Pin 2	External Interrupt INT0
XVII.	(INT1) PD3	I/O PORTD, Pin 3	External Interrupt INT1
XVIII.	(OC1B) PD4	I/O PORTD, Pin 4	PWM Outputs
XIX.	(OC1A) PD5	I/O PORTD, Pin 5	
XX.	(ICP) PD6	I/O PORTD, Pin 6	Timer/Counter1 Input Pin
XXI.	PD7 (OC2)	I/O PORTD, Pin 7	Timer/Counter2 Match Output
XXII.	PC0 (SCL)	I/O PORTC, Pin 0	TWI Interface
XXIII.	PC1 (SDA)	I/O PORTC, Pin 1	
XXIV.	PC2 (TCK)	I/O PORTC, Pin 2	JTAG Interface
XXV.	PC3 (TMS)	I/O PORTC, Pin 3	
XXVI.	PC4 (TDO)	I/O PORTC, Pin 4	
XXVII.	PC5 (TDI)	I/O PORTC, Pin 5	
XXVIII.	PC6 (TOSC1)	I/O PORTC, Pin 6	Timer Oscillator Pin 1
XXIX.	PC7 (TOSC2)	I/O PORTC, Pin 7	Timer Oscillator Pin 2
XXX.	VCC	Voltage Supply = VCC for ADC	
XXXI.	GND	GROUND	
XXXII.	AREF	Analog Pin for ADC	
XXXIII.	PA7 (ADC7)	I/O PORTA	ADC Channel 7
XXXIV.	PA6 (ADC6)	I/O PORTA	ADC Channel 6

XXXV	PA5 (ADC5)	I/O PORTA	ADC Channel 5
XXXVI	PA4 (ADC4)	I/O PORTA	ADC Channel 4
XXXVII	PA3 (ADC3)	I/O PORTA	ADC Channel 3
XXXVIII	PA2 (ADC2)	I/O PORTA	ADC Channel 2
XXXIX	PA1 (ADC1)	I/O PORTA	ADC Channel 1
XL	PA0 (ADC0)	I/O PORTA, Pin 0	ADC Channel 0

W3school.com is referred.

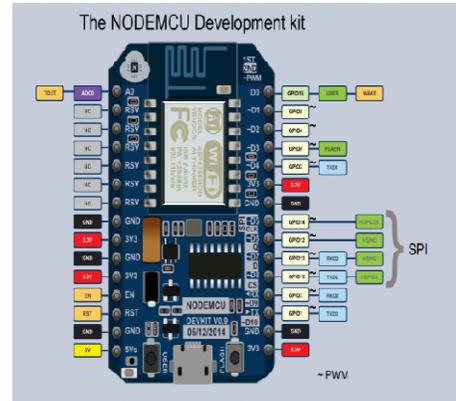


Fig 4 node MCU kit

NodeMCU provides access to the General Purpose Input/output and for developing purposes below pin mapping table should be referenced.

IO index	ESP8266 pin	IO index	ESP8266 pin
0	GPIO16	7	GPIO13
1	GPIO5	8	GPIO15
2	GPIO4	9	GPIO3
3	GPIO0	10	GPIO1
4	GPIO2	11	GPIO9
5	GPIO14	12	GPIO10
6	GPIO12		



Fig 3.1 basic structure of umbrella

XIII. ULTRASONIC SENSOR:

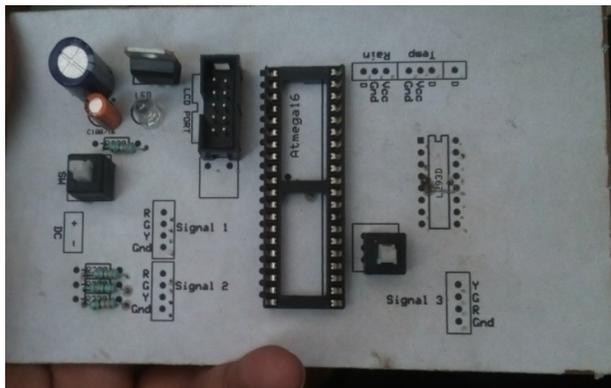


Fig 3.2 main power circuit

XII. NODE MCU:

Node MCU has used to create WI -fi connection and it is used for remote correspondence between two devices. It has 12 pin IC. For withoutwire communication creating HTML coding is used. For learning of HTML coding



Fig 5 ultrasonic sensor

Ultrasonic sensor has used to detect the object and having 4 pins they are following:
1 VCC

- 2 Trigger
- 3 Echo
- 4 Grounds

VCC and GROUND pins are used to supply and another pins that is Echo and trigger

So trigger referred as a transmitter and echo used as a receiver it is a device that can be used to measure distance by utilizing sound waves. It measures distance by transmitting sound wave at a specific frequency and listening for that sound wave to bounce back.

XIV.6 VOLT DC MOTOR:



Fig.. 6 dc motor

A DC outfitted engine is fundamentally a basic DC engine with a rigging box joined to it. The speed of the engine is tallied as far as Rotations every moment or RPM. The fundamental favorable position of utilizing the rigging get together is that it decreases the engine speed besides it helps in expanding the engines torque.

DC engine is utilized as a part of classification of Robotic Applications and is approachable in different RPM. These DC outfitted engines have a 3 mm penetrate gap .the pole consequently making it easy to interface it to the wheel or some other mechanical gathering.

A DC engine is any of a class of turning electrical machines that believes coordinate current electrical vitality into mechanical vitality. The most widely recognized writes depend on the powers created by attractive fields. About a wide range of DC engines have some interior system, either electromechanical or electronic, to occasionally alter the course of current stream in part of the engine.

DC engines were the main sort generally utilized, since they could be fueled from existing direct-current lighting power circulation frameworks. A DC engine's speed can be controlled over a wide range, utilizing either a variable supply voltage or by changing the quality of current in its field windings. Little DC engines are utilized as a part of instruments, toys, and apparatuses. The all-inclusive engine can work on coordinate current however is a lightweight engine utilized for versatile power apparatuses and machines.

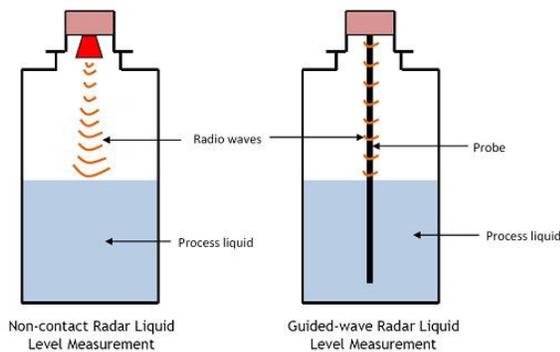


Fig. 7 Detection of distance level

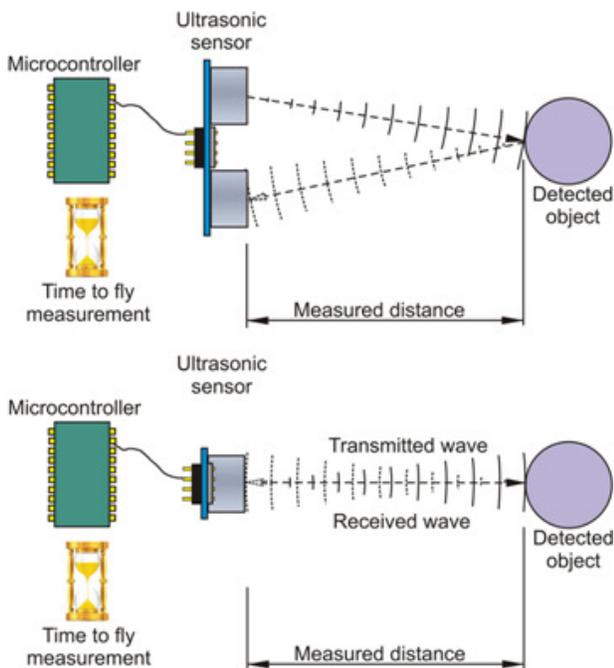


Fig.8.transmitting waves

XV. APPLICATIONS:

UMBRELLA:

- Using umbrella we can save the crops from unwanted and unseasonable rains.
- Protect Traffic police from sun rays

GARBAGE:

- Real time information on the fill level of dustbin.
- Improve environmental quality.

- Sharp usage of dustbin.
- Hospitals
- Roadsides
- Residential areas
- Public places

XVI. ADVANTAGES:

- Less pollution
- Clean city
- It can hold overflowing of dustbins along the roadsides and smart bins are managed at real time.
- The cleaning and filling time of smart bin will also be reduced

XVII. CONCLUSION:

In this paper we have introduced the concept of Umbrella and waste system. We have executed real time waste management system by using IOT we check the fill level of smart dustbins, whether it is full or not. In this way, the information of all dustbins, we can be accessed from anywhere and anytime by the person of corporation and they can take a decision accordingly. By executing this proposed framework the cost is less, asset enhancement, powerful utilization of dustbins should be possible. This framework by implication lessening movement in the city. In significant rural communities the rubbish gathering vehicle visit the territory's regular twice or thrice upon the number of dustbins in the specific zone and resulting there is dustbins may not be full. This paper has informed the status of each and every dustbin in real time and real life so that the municipal authority can send the garbage collection vehicle only when the dustbin is full.

XVIII. FUTURE SCOPE:

Using umbrella we can save the crops from unwanted and from unseasonable rains.

It has used to multipurpose outlets to charge mobile like power bank also umbrella link with gps through Coding. So we track location of umbrella for another purpose.

As we see now traffic signals indicating light are placed center at the square. Traffic police are standing in the sun in high temperature this causes to body from radiations from sun rays for using umbrella we prevent traffic control police from

Radiations from sun rays. As waste administration activities everywhere throughout the world, the Degree for the future work is this framework can be executed with time stamp in which continuous clock appeared to the worry individual at what time clean container is full and at what time the waste is gathered from the brilliant dustbins.

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