

AI Controlled Smart Room

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Abstract—AI controlled smart room is a concept which means all the electronic devices will be controlled by the help of AI. The AI will control the room using an algorithm which will be given by the programmer and will be implemented to the main control device. The world is improving technologically. An AI controlled smart room can be a step ahead to advanced future.

Index Terms—AI, Smart Room, Arduino, flowchart, Sensors.

I. INTRODUCTION

Artificial Intelligence(AI) is also known as machine intelligence. It means a machine made by human that is intelligent, can think, can learn and process on its own [1]. AI is being used in every sector of science. So, using AI to make room smart is can be a good thing. In a smart room there are some electric devices like light, fan, AC etc. People have to on/off them manually using switch or remote. Sometime is really annoying to do change the temperature or lower the fan speed by hand. Also switching between AC to fan according to temperature is really frustrating. If these works can be done by an intelligent system it will be very helpful. The main goal of this report is to make a system which is connected to all the device and the system will be controlled by Artificial intelligence.

II. COMPONENT LIST AND PRICING

Here is a brief details about the components and how much the cost in total:

Component Name	No of item	Price/piece(tk)
Arduino UNO	1	400
O-Led Display	1	422
Luminance Sensor	1	65
DHT11	1	150
Buzzer	1	16
Sound Sensor	1	120
Led Blue	1	5
Led Red	1	5
DC motor	1	520
Total:	9	1703

Fig. 1. Component Name with price

III. THEORY AND METHODOLOGY

In order to complete this project first we have to learn the basics, How it works. We are going to form a flow chat which will show how and when which all the components works. what logic they follow to serve their purpose. Also there will be brief discussion about the components that have been used.

A. Component Details

The In this project we have used the components which works to control the AC, Light and fan. The Main component is Arduino Uno where we connected all the components and inserted our logic code.

1) *Arduino Uno*: It is a microcontroller board based on a removable dual-inline-package (DIP) ATmega328 AVR microcontroller. They are cheap and easy to program. It can read input like from sensors and according to how it was programmed it give a definite output [2]. In our project Arduino Uno will take input from the sensors we are using and work according to the logic program.

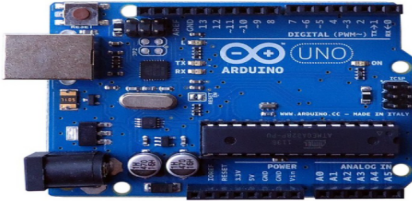


Fig. 2. Arduino uno.

2) *DHT11*: In our project we need a sensor which can detect the presence or concentration of gases in the atmosphere. As it was not easy to find we used DHT11 sensor a complementary. It actually works as temperature and humidity sensor [3]. The main purpose of using this type of component is to measure the temperature and pollution level in the air. The level of pollution will determine whether the AC will remain off/on

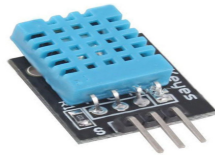


Fig. 3. DHT11

3) *Sound Sensor*: The work of sound sensor is to detect sound. It detects the sound intensity of the surroundings. A diaphragm in the microphone of sensor receive Sound waves and responses by vibrating. It results in capacity change and is digitalized and amplified for processing of sound intensity [4]. In our project we use it to detect noise.

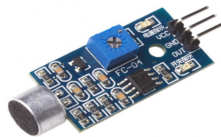


Fig. 4. Sound Sensor

4) *DC motor*: We use arduino dc motor shield which lets us use two DC motor. In our project DC motor is needed to control the speed of fan. According to the need the fan will be at full or medium or off state. Motor Shield allows us to easily control the motor direction also. In our design DC motor is very important component.

5) *Luminance Sensor*: It detects the intensity of the ambient light. Luminance sensor has the responsivity closer to human eyes. We use luminance sensor to detect whether it is day or night or afternoon.

6) *Buzzer*: A buzzer is an audio signal device. It is typically used for alarming purpose. In our project we used buzzer to signal us when sound sensor detects sound level more than 500 decibel.

7) *LEDs*: Two LED have been used. one is red and another is blue. The blue one works to indicate whether it is day or night and red LED works to signal if the air pollution is too much in within the room. when DHT sensor detects air high air pollution the the red light works as an indicator.

B. Flowchart

before implementing the components we have formed a flowchart showing logic behind how they will work. This is the flowchart showing the total work flow of our project. The As this is a big flowchart we had to separate it into two parts. Also we indicated which is connected which so there will be no confusion.

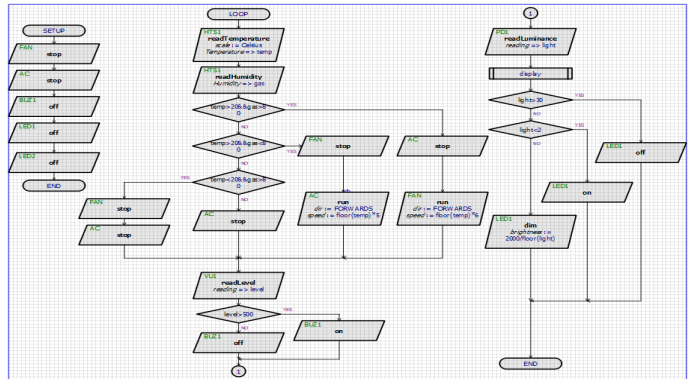


Fig. 5. Flowchart 1

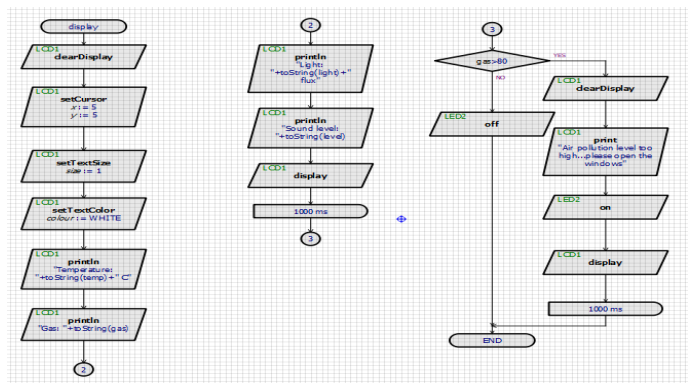


Fig. 6. flow chart 2

IV. IMPLEMENTATION PROCEDURE

We have designed and implemented our whole project in proteus. Here is the procedure how we have implemented everything

- First We have designed a flow chart showing how our system will work
- Then from the library we selected all the items that we need
- Connect all the item to the arduino pin and checked that each of the item connected to different pin of the arduino.
- Then simulated the project and found our expected outcome.
- We made sure the display is showing the results properly and each of the item are working properly by varying their values.

V. DATA COLLECTION METHOD

The table below is showing how all the data were collected.

Purpose	Componet	Condition	Action
LED off/on	Luminance sensor	LED>30	LED off
		LED<2	LED on
		2<LED<30	Brightness = 2000/floor(light)
FAN and Air Condition	DHT11	Temperature>20 && gas>80	AC off, Red Led On, FAN: speed=floor(Temperature)*6
		Temperature>20 && gas<80	FAN off AC : speed=floor(Temperature)*5
		Temperature<20 && gas>80	FAN off AC off, Red Led On
		Temperature<20 && gas<80	FAN off AC off
Sound	Sound sensor	Level >500db	Buzzer on
		Level <500	Buzzer off

Fig. 7. Data Collection

VI. TESTING AND RESULT

for our simulation we used proteus software. In this software we simulated our project and measured the the expected outcome. we varied the input values and tried to find out whether we are getting correct output. Here are some simulation image is given below: So the first condition we checked **When temperature > 20 gas > 80 and when it is night** in this condition the result will be AC will be off and fan is and FAN will be running and red LED will be on.The blue light is on. And the result we go is correct.

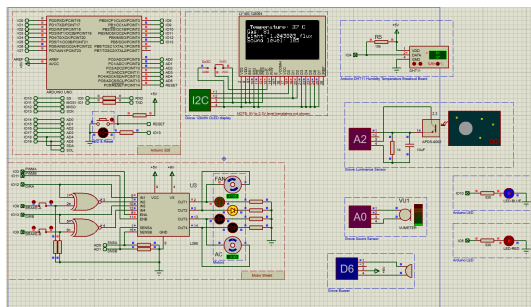


Fig. 8. Simulation 1

The second condition we tested **When temperature > 20 gas < 80 and It is daytime and sound level< 500**. The expected result will be AC is On. No buzzer.And the blue light is off.

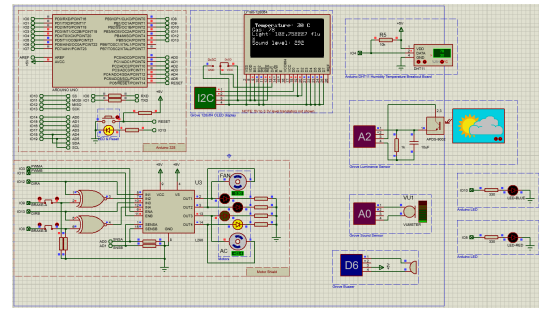


Fig. 9. Simulation 2

The third condition we tested **When temperature < 20 gas < 80 and It is daytime and sound level< 500**. The expected result will be AC will be off and also the fan will also be off. No buzzer.And the blue light is off.

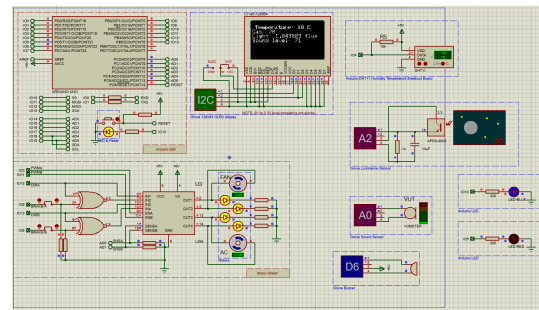


Fig. 10. Simulation 3

VII. IMPACT OF AI CONTROLLED SMART ROOM IN SOCIETY AND ENVIRONMENT

Noise pollution is one the major problem in our social life. The way of producing electricity is not good for human and nature.AI control smart room mainly focus about make awareness' when some area has over noise and also this system make the proper used of Electrical equipment according to used various kind of sensors data. AI controlled smart room is give alarm by buzzer when some area has over noise from this process our society will safe from over noise and as well as the people are safe from over noise. Some times our Ac , fan, lights are used for unnecessary purpose. That is one of the major cause of waste our electricity. We know the process of producing is harmful for our society as well as the environment so if we waste our electricity so we have to produce more and more electricity. Our resource will be wasted for producing the extra electricity. So we can control our ac , fan and light by using this system. So by using this system we can reduce the use of electricity in our daily life as well as we can reduce the waste amount that will beneficial as a economical purpose as well as our environment and society will be beneficial by this system.

VIII. CONCLUSION

The world is getting advanced with the help of technology. People's life is getting more easier and comfortable. The

concept AI controlled smart is also pointing towards the advanced future that our home/offices/mill will be controlled by AI and advanced technology. It has become a people need now a days. As AI is every where we can also use it to Make our room smarter.

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- [4] <https://www.seeedstudio.com/blog/2020/01/03/what-is-a-sound-sensor-uses-arduino-guide-projects/>