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PERSON COUNTER AND TEMPERATURE MONITORING

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Abstract— A room can allocate only a certain amount of person if it exceeds that amount, the people inside will suffocate. To overcome this effect, it automatically changes the temperature of AC or increase the Fan speed [either increase or decrease]. To monitor the room, we are using Temperature Sensor, Flame Sensor, PIR Sensor, IR Sensor. We use GSM to transmit the Data to desired mobile devices. We also use LED and buzzer to indicate fault on station.

Keywords— Base Station Subsystem [BSS], Network Switching Subsystem [NSS], Operational Support Subsystem [OSS], Mobile Station [MS], Base Transceiver Station [BTS], Base Station Controller [BSC], Mobile Switching Centre [MSC], Home Location Register [HLR], Visitor Location Register [VLR], Authentication centre [AUC], Operation Maintenance Centre [OMC], Equipment Identify Register [EIR].

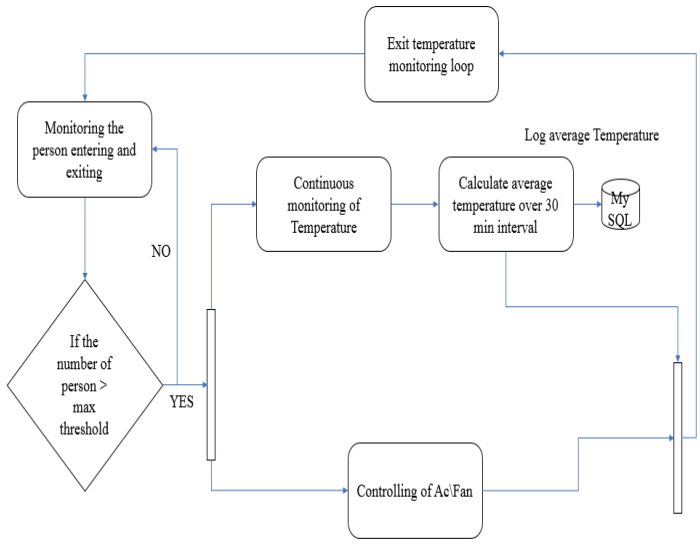
I. INTRODUCTION

If say a room as reached the maximum limit in that case the temperature will start increasing and also the humidity in that room will increase to overcome this negetivity we have come up with this project. We have used Infra Red Sensors [IR] to count the number of person entering and exitng the room and also with the help of Passive Infra Red Sensors [PIR] we can also dectect the presence of the being. When the count reaches it maximum limit with the help of temperature sensor it will measure the surrounding if its abnormal it will automatically adjust the temperature of the AC or FAN [Increase the FAN speed]. If there is very less number people inside the room the temperture sensor will measure the value and accordingly it will decrese the temperature of the AC or FAN [Reduce the FAN speed]. We have included Flame Sensor in the case of Fire it will sense the surrounding and with the help of buzzer and led it will make uncomfortable noises. We have included Global System for Mobile Communincation [GSM] to tranfer the data obatined to wireless device. If deemed necessery they canshutdown the whole systemor they can intimate the person who is inside the room of the fault and they can act on it. All these are possible only because of the Aurdino Microcontoller. We can also include Flame Extinguisher and WebCam for the future purposes.

II. PROPOSED SYSTEM

In previous system person counter and temperature monitoring where using different devices to measure but in this system, we are using both the sensors in a same device so it would be compact.We are using real time temperature sensor like DHT 11sensor. These data can be send to any wireless device with the help of GSM. We have included many more features.

III. FLOW CHART



When the system is turned on. The IR sensor will startcounting the number of person entering and exiting the room. If the number of person inside the room exceeds the

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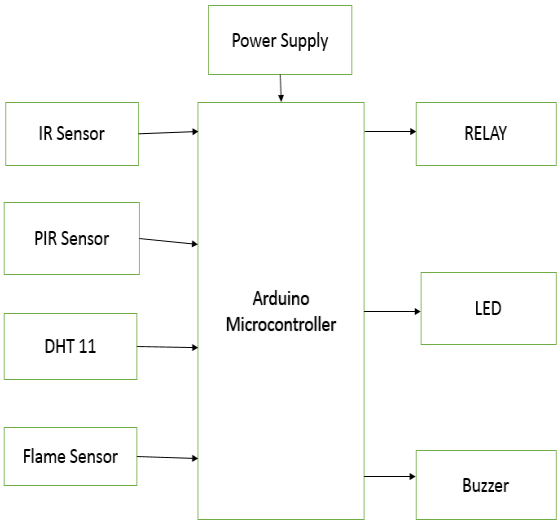
max threshold then it will start to monitor the temperature when the temperature exceeds the maximum level then it starts to control the Ac\Fan. The temperature is calculated at a time interval of 30 minutes. When error has been detected by using GSM the data has been transmitted to mobile device which is registered with the GSM by using our mobile device we either shutdown the system or we can intimate to the manager who is present there to monitor what has gone wrong.We can add new sensors when required therefore it makes this project more helpful for the users.

IV. BLOCK DIAGRAM

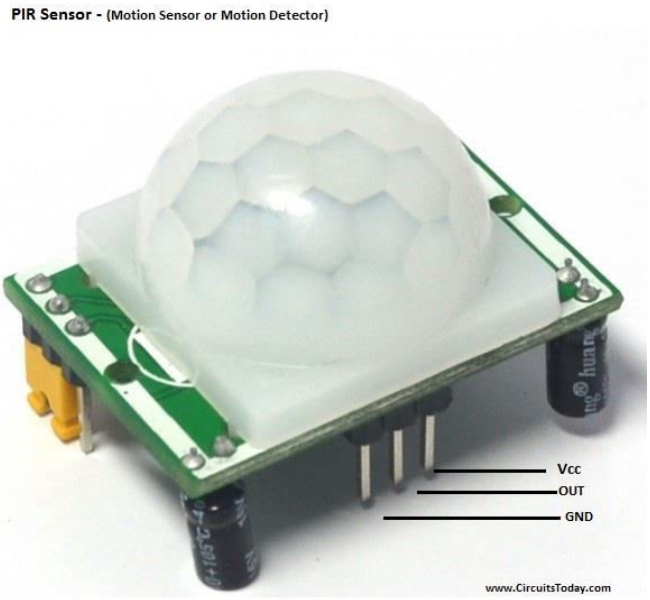


For this project we have used Arduino Microcontroller, GSM [global system for mobile communication], Power supply, InfraRed sensors [IR], Passive InfraRed sensors [PIR], Temperature sensor [DHT 11], Flame sensors, LED, Buzzer, and we can also include flame extinguisher and webcam which we will be adding on as future scope project. As the above diagram shows we have used lot of sensors to make it more useful. Power supply is common to all system. The Microcontroller we use is LPC812.DHT 11 is the temperature sensor used in this project. The data from the room is transmitted to mobile phones through GSM system which we have used. So, we can control the system through mobile.IR sensor is used to count the person entering and exiting the room. If we want we can setup a buzzer which can intimate that there is some kind of problem inside the room by making a huge noise. Relay is used to control the appliances.

INFRARED SENSORS

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. This is used to count the number of person entering and exiting the room. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received.

PASSIVE INFRARED SENSOR [PIR]



A PIR sensor which is also known as Pyroelectric sensor or Passive Infrared Sensor is basically an electronic sensor employed in motion detecting applications. A PIR sensor detects or measures IR (Infra-Red) radiations emitted by any object inside its field of view. A PIR sensor is generally known to the world as motion sensor or motion detector. We can actually build motion sensors or motion sensing lights we get on market with the help of Arduino and PIR sensors. In a practical aspect, all objects emit heat energy in the form of radiation. The theory behind this concept is that all objects with a temperature above absolute zero (absolute zero is -273.15-degree Celsius or zero kelvin) emit heat energy in the form of radiation at infra-red wavelengths. These emitted infra-red radiations can be detected with the help of electronics and this principle is employed in the design of a PIR sensor. A PIR sensor do not emit any kind of radiation for detection purposes but they just measuretheinfra-red radiation

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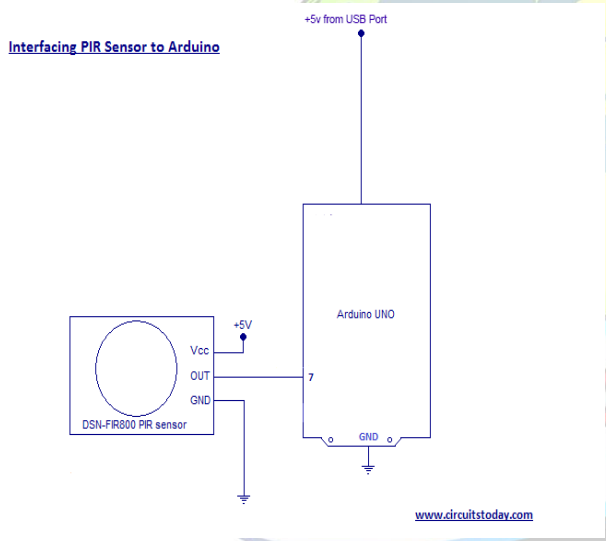
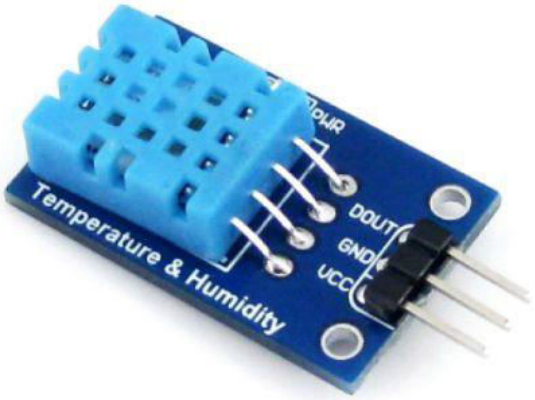
emitted by other objects inside its field or range of measurement.This is simply used to detect the presence of the living being through the radiation they emit. Assemble the circuit as shown in diagram given below. A PIR sensor module has only 3 pins– one is Vcc which is a +5 volts input, a ground pin and finally the digital output pin. Connect +5V from Arduino to Vcc of PIR sensor module, connect a GND from Arduino to ground of PIR sensor and finally connect the output pin (marked as 'out') to any digital pin of Arduino. In our circuit diagram, we have connected it to pin 7 of Arduino. Possible outputs from PIR sensor module. The PIR sensor module has got only one digital output mode. So, it has only 2 possible output values – either a HIGH or a LOW. By default,when there is no object inside the range of PIR sensor it gives output a LOW value or 0V at output. When an object is identified inside the range of PIR sensor it immediately gives output a HIGH value or +5V at output.



TEMPERATURE SENSOR
DHT 11



DHT11 is a Humidity and Temperature Sensor, which generates calibrated digital output. DHT11 can be interface with any microcontroller like Arduino, Raspberry Pi, etc. and get instantaneous results. DHT11 is a low-cost humidity and temperature sensor which provides high reliability and long-term stability. DHT11 is a part of DHTXX series of Humidity sensors.Both these sensors are Relative Humidity (RH) Sensor. As a result, they will measure both the humidity and temperature. Although DHT11 Humidity Sensors are cheap and slow but they are accurate. The DHT11 Humidity and Temperature Sensor consists of 3 main components. A resistive type humidity sensor, an NTC (negative temperature coefficient) thermistor (to measure the temperature) and an 8-bit microcontroller, which converts theanalog signals from both the sensors and sends out single digital signal. This digital signal can be read by any microcontroller or microprocessor for further analysis. DHT11 Humidity Sensor consists of 4 pins: VCC, Data Out, Not Connected (NC) and GND. The range of voltage for VCC pin is 3.5V to 5.5V. A 5V supply would do fine. The data from the Data Out pin is a serial digital data.DHT11 Sensor can measure a humidity value in the range of 20 – 90% of Relative Humidity (RH) and a temperature in the range of 0 – 50^0C. The sampling period of the sensor is 1 second. That is with the help of this sensor we find the temperature and humidity value of the room. If it exceeds the maximum value which is stored in it, then it adjusts the ac or fan accordingly to match the room temperature. The data from the sensor consists of integral and decimal parts for both Relative Humidity (RH) and temperature. The data from the DHT11 sensor consists of 40 – bits and the format are as follows:8 – Bit data for integral RH value, 8 – Bit data for decimal RH value, 8 – Bit data for

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integral Temperature value, 8 – Bit data for integral Temperature value and 8 – Bit data for checksum.

Example

Consider the data received from the DHT11 Sensor is

00100101 00000000 00011001 00000000 00111110.

This data canbeseparated basedon theabove-mentioned structureas follows

00100101	00000000	00011001	00000000	00111
High Humidity	Low Humidity	High Temperature	Low Temperature	Checksum (

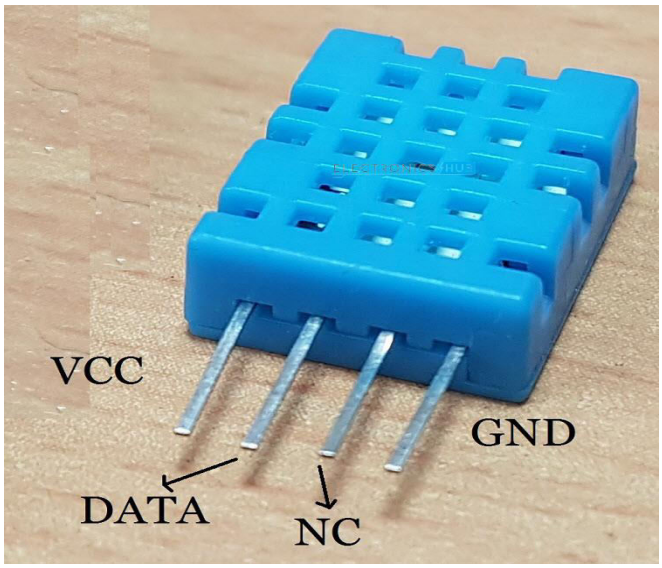
In order to check whether the received data is correct or not, we need to perform a small calculation. Add all the integral and decimals values of RH and Temperature and check whether the sum is equal to the checksum value i.e. the last 8 – bit data.

00100101 + 00000000 + 00011001 + 00000000 = 00111110

This value is same as checksum and hence the received data is valid. Now to get the RH and Temperature values, just convert the binary data to decimal data.

RH = Decimal of 00100101 = 37%

Temperature = Decimal of 00011001 = 25^0C



FLAME SENSORS

The use of flame sensor is used to detect the fire in the room. If say a fire has been detected during working hours then we can able to extinguish it manually. If it happens during night time then we need inplaced fire extinguisher to extinguish the fire automatically when it's been detected. This feature is being made available for future purpose since Arduino does not support these sensors.

V. CONCLUSION

This project when merged with certain established technologies can be effective in thick populated areas. As the growth in population is vertical, in such areas this project would be useful and cost effective. Future Scope: we can also use fire extinguisher to prevent fire accident and Webcam can be used to monitor live feeds from Centre.

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