

IOT Technology Enabled Multi-Purpose Chair to Control the Home/Office Appliance

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ABSTRACT

In everyday life the chair is essential for every individual. In the places like house, office and hospitals, the chair is using for long duration. The proposed system is a IoT technology enabled multi-purpose chair, that can be used in home, office and hospitals by implanting/attaching the health sensors like AD8232-Ecg sensor, BP sensor, LM35 temperature sensor, venier blood pressure sensor, and weight sensor to the node MCU micro-controller together with the thing speak cloud platform and IFTTT technology. With this the office head can know the duration of the hours of his employee that who is sitting in chair. Similarly the doctors can know the immediate health conditions of the patients. Similarly the person who is sitting on the chair can control the home appliances from on chair itself. In this proposed system will get both the local and global alerts with the help of the buzzers and the SMS. This system will lead to monitor the employees, patients and appliances remotely.

Background: The invention relates to sending the message to the doctors, whenever there patient gets abnormal conditions of their health. The conditions may be Blood Pressure, Sugar level, Fever, Symptoms of Heart Attack; ECG etc. simultaneously by this proposed chair can control the home/office appliance also. This can be used in home, office and hospitals.

Objectives:

1. To Design and develop the chair that can automatically control the home appliances/office appliances locally and globally.
- 2.To design and develop the chair that can detect the abnormal condition of the person.
- 3.To design and develop the chair that can calculate the time of the person sitting on the chair.
- 4.To send the SMS alert globally to the registered doctors/any others, if the person sitting on the chair is in abnormal conditions.
5. Give the local alert system with the help of alarm within that house or office.

Methods: The proposed system will immediately detect the health condition of the users that who sit on the chair with the help of buzzer and SMS. Similarly the proposed system facilitates the user to control home appliances locally and remotely. It will help the users to get prescribed by the doctor remotely and can control the home appliances by sitting on the chair itself and remotely with the help of a mobile phone.

Conclusions: Accordingly a novel IoT enabled multi-purpose chair will facilitate the users to control the home appliances locally and globally similarly, it detects the abnormal state of the health condition, of the users local and globally and finds the duration of the time that the person sitting on the chair for monitoring purpose.

Keywords: Smart Chair, Hospital Management, Home appliance, Sensors, Monitoring, Image verification, Log Maintenance, Smart device, Internet of Things.

1. Introduction

The invention relates to sending the message to the doctors, whenever there patient gets abnormal conditions of their health. The conditions may be Blood Pressure, Sugar level, Fever, Symptoms of Heart Attack; ECG etc. simultaneously by this proposed chair can control the home/office appliance also. This can be used in home, office and hospitals.

More particularly this invention relates placements of a health monitoring sensors like BP, Sugar, Fever, Pulse rate, Temperature, ECG etc. for recognition of the body condition immediately and sends the SMS to the registered doctors. So that based on the message that received by the doctors can assist patients remotely. This will help for the elderly persons and who are in the remote places. This also has a feature where the appliances can control automatically. By this can find the duration of person in hours sitting on the chair in working hours.

2. Prior Art

The existing multifunctional inflatable chair will detect the posture and position of the body while sitting on it. It can operate manually or automatically [1-5]. It has air bags which feel to sit comfortably. In the multifunctional intelligent chair has a fan at the back portion of the chair to cool the temperature with the automatic feature. In the smart seat cover has a facility to alert the person when the sitting posture is not good if it is out of threshold value. The smart chair will work with the app that connected to the chair to collect the details of the candidate manually through phone [6-10].

DISADVANTAGES OF EXISTING SYSTEM [11-15]:

Existing System has few disadvantages like:

- No continuous monitoring of the person, no SMS alerts will be sent to the Doctors/any others.
- No data will be stored in the cloud.
- Chairs are not embedded with Health sensors
- No control of home appliances from the chair
- No remote message alerts to the doctors/any others.
- No immediate detection of the abnormal condition of the persons.
- No internet connectivity for remote assistance by the doctors
- No time calculations of employees that who is sitting on the chair.

3. Proposed Method

The proposed system will immediately detect the health condition of the users that who sit on the chair with the help of buzzer and SMS. Similarly the proposed system facilitates the user to control home appliances locally and remotely. It will help the users to get prescribed by the doctor remotely and can control the home appliances by sitting on the chair itself and remotely with the help of a mobile phone.

A. PROJECT OBJECTIVES

- To Design and develop the chair that can automatically control the home appliances/office appliances locally and globally.
- To design and develop the chair that can detect the abnormal condition of the person.
- To design and develop the chair that can calculate the time of the person sitting on the chair.
- To send the SMS alert globally to the registered doctors/any others, if the person sitting on the chair is in abnormal conditions.
- Give the local alert system with the help of alarm within that house or office.

Based on the key points of the invention that discuss above will draw the following that which will clearly illustrate the proposed system.

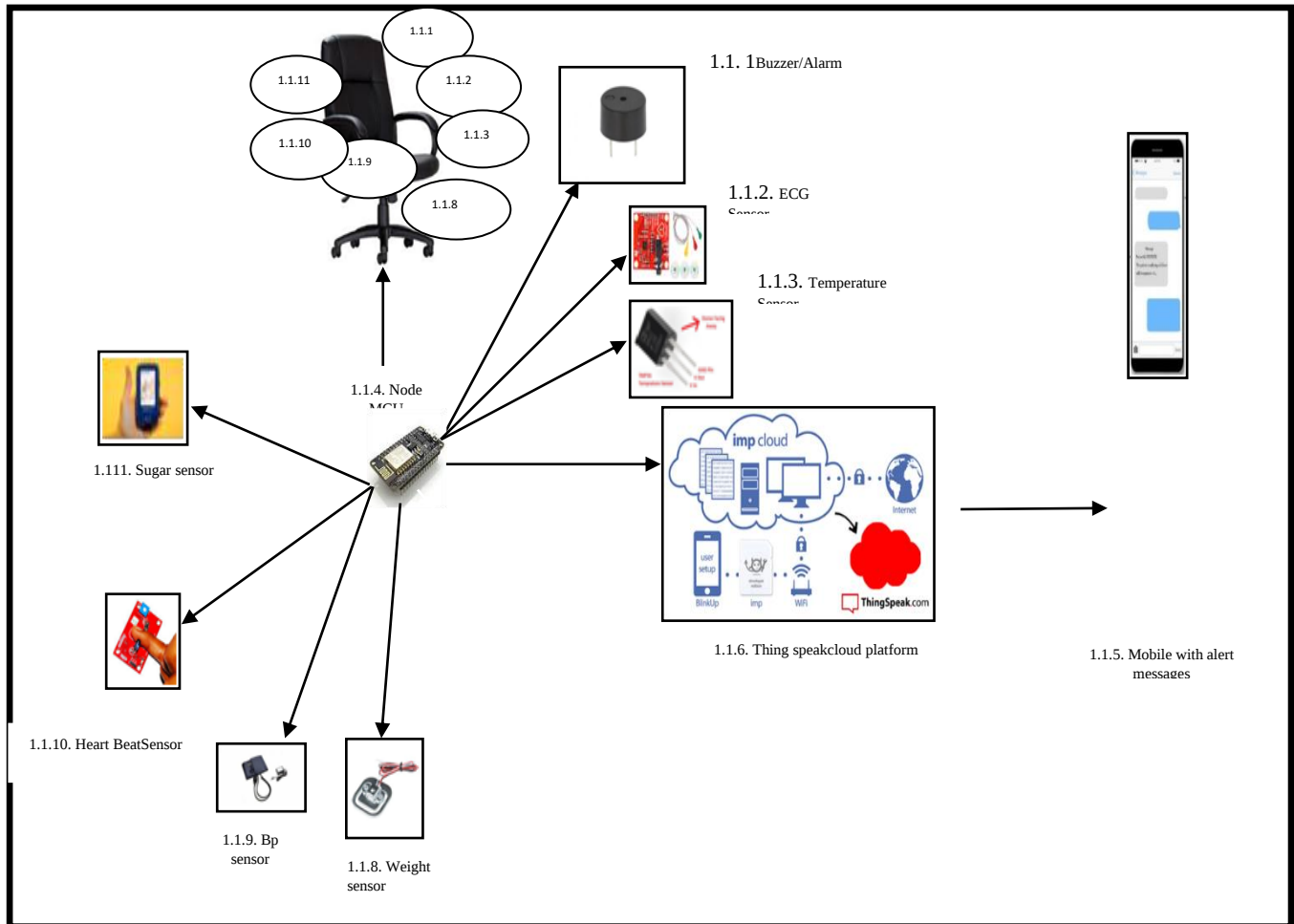


Figure 1 Chair embedded with the Health sensors

With the help of a temperature sensor, health sensors (AD8232-Ecg sensor, BP sensor, LM35 temperature sensor, venier blood pressure sensor, and weight sensor) detects the immediate health condition of the users and detected values will be pushed to the cloud if any abnormal values, the system will produces the local alert and global alert in the form of alarm or SMS message. By placing the weight sensors under the chair, can control the home appliances locally and globally and with this weight sensor can calculate the total number of hours sitting on a chair.

Figure 1 shows the Chair embedded with the Health sensors, Figure 2 shows the Chair embedded with the sensors to control the home/office appliance Figure 3 shows the way of sending the SMS as a global alert by using IFTTT technology.

Where,

1. Smart Chair: Under this we need to place a weight sensor, health sensors to control the home appliances and to detect the abnormal condition of the health.
2. Node MCU: It is a Wi-Fi enabled micro-controller that facilitates to connect the sensors, process the values that getting from sensors, pushing that values to the cloud and based on the abnormal values this should actuate the local alert and global SMS alert. It is a crucial device which will provide the interface between the weight sensor, health sensors, Alert (buzzer) sensors, internet, cloud and global SMS alert.

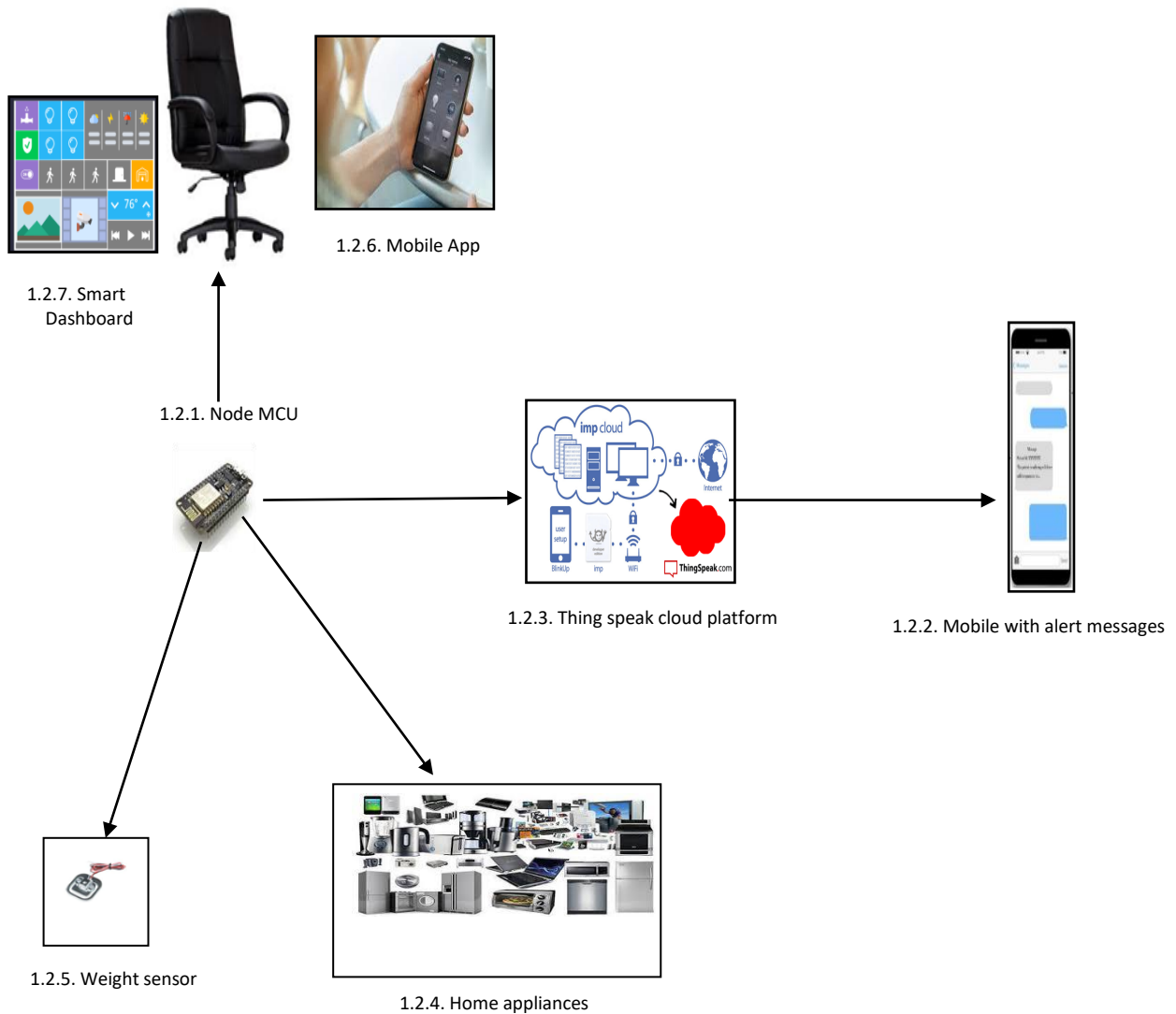


Figure 2 Chair embedded with the sensors to control the home/office appliance

3. Sensors: various health sensors (AD8232-Ecg sensor, BP sensor, LM35 temperature sensor, veneir blood pressure sensor, and weight sensor) are used to detects the immediate health condition of the users.

4. Cloud: It is a storage system, where the sensor data is stored and processed. Here the things speak cloud platform was used.

5. Home appliances: It may be an AC or Fan or laptop in an office. It may be a fridge, washing machine, light, Ac etc. in a home.

6. Mobile phone: This is used to receive the SMS alert from the proposed chair to the doctors to know the condition of the health of the users. By this doctors can prescribe the appropriate medicines by using the SMS values.

7. IFTTT: It is a technology where can send the message to the mobile number if any event happens. Here if any abnormal values of the health conditions of the users detected then it sends the SMS to the registered doctors

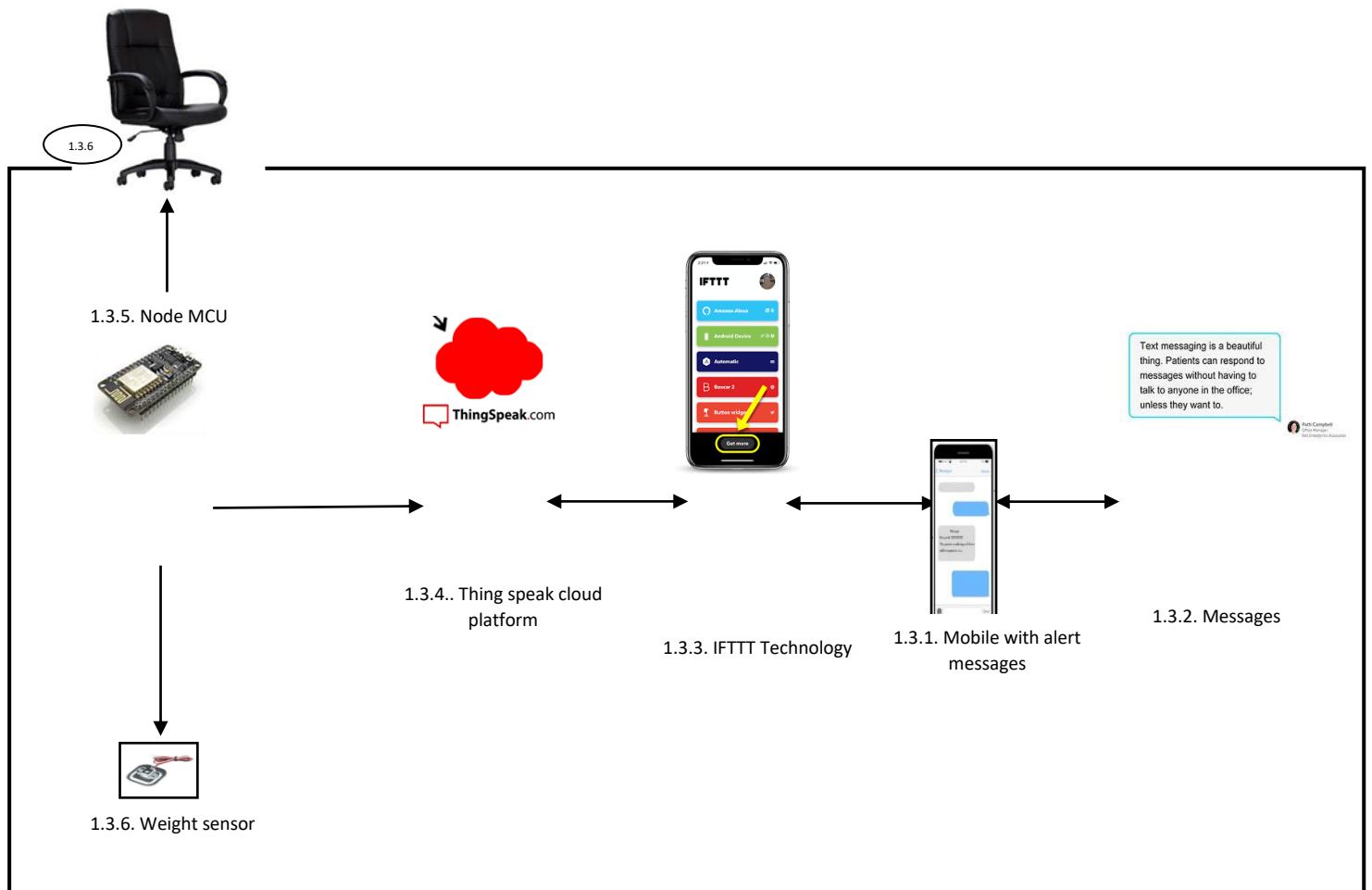


Figure 3 sending the SMS as a global alert by using IFTTT technology

4. Working Principle

The proposed system will immediately detect the health condition of the users that who sit on the chair with the help of buzzer and SMS. Similarly the proposed system facilitates the user to control home appliances locally and remotely. It will help the users to get prescribed by the doctor remotely and can control the home appliances by sitting on the chair itself and remotely with the help of a mobile phone.

This can be constructing in 3 modules.

Module 1:

Implanting/embedding the weight sensor under the chair, to control the home appliances and to calculate the time duration of a person sitting on that chair.

Module 2:

Implanting the health sensors (AD8232-Ecg sensor, BP sensor, LM35 temperature sensor, veneir blood pressure sensor and weight sensor) and buzzer to the chair with the connection of node MCU.

Module 3:

Sending the global SMS to the doctor/boss of office and getting the local alerts by using the buzzers and IFTTT Technology.

Module 1:

The weight sensors will be placed under the chair that which will help to detect the presence of a human being on a chair by calculating the weight of the person. This weight sensor will connect to the node micro-controller which is wifi enabled. This node MCU will act as a processor it, supplies the electricity to the connectivity to the chair. The home appliances like the fan and AC will connected to the node MCU and actuated by the weighted sensor value. The node MCU will send the read weight sensor value to the things speak cloud platform will store the sensor values and home appliances values continuously in every second based on the uploaded values we can measure the duration of the person sitting on a chair, duration of the hour that ran by the home appliances based upon this the users can take the decisions to change the mode of the energy. As the readings were stored in a cloud can control the home appliances remotely by using the things cloud platform i.e triggering can be done based on the uploaded readings by using the things cloud platform and IFTTT Technology with IFTTT technology the hours of duration of a person sitting on a chair or hours of a home appliances run time can be SMS to the registered users.

Module 2:

To the chair the temperature sensor was attached to detect the fever, the BP sensor was attached to detect the blood pressure, ECG Sensor was attached to detect the ECG , Heart sensor was attached to detect heartbeat, sugar sensor was attached to detect the sugar levels sitting on the chair. This all sensors will be connected to the node MCU, values will be pushed to the cloud, based on the uploaded values, the triggering can be done to get the local alert the buzzer was connected to the node MCU.

Module 3:

Based on the readings that uploaded in the cloud platform with the help of an IFTTT(If This Then That Technology) The global SMS alert was sent to the doctor or head of the office. If any abnormal values detected from the user that sitting on the chair similarly by detecting the abnormal values to get the local alert the buzzer will be high.

5. Results

The implementation part shows how the multi-purpose chair works:

1.Placement of a weight sensor under a chair to know the duration of the person sitting on the chair and to control the home appliances.

1.1 Weight sensor is a physical entity which will be connected to the analog pin of node MCU micro-controller as an input.

1.2 The input values will be stored in the thing speak cloud platform

2. Placement of the health sensors (AD8232-Ecg sensor, BP sensor, LM35 temperature sensor, veneir blood pressure sensor and weight sensor) for immediate detection of health condition of person sitting on chair.

2.1Sensors will be connected to digital pin/analog pin of micro-controller to take the input values of the user.

2.2Buzzer will be connected to the digital pin of micro-controller as an output to give to the local alert

3.Sending the SMS to the mobile based on the abnormal values getting from the health sensors and from the weight sensors by using the IFTTT technology.

3.1 With the help of the thing speak cloud platform and IFTTT technology the SMS will be sending to the registered users.

4. Controlling of home appliance through automatic, mobile app/smart chair dashboard by seating in the chair itself.

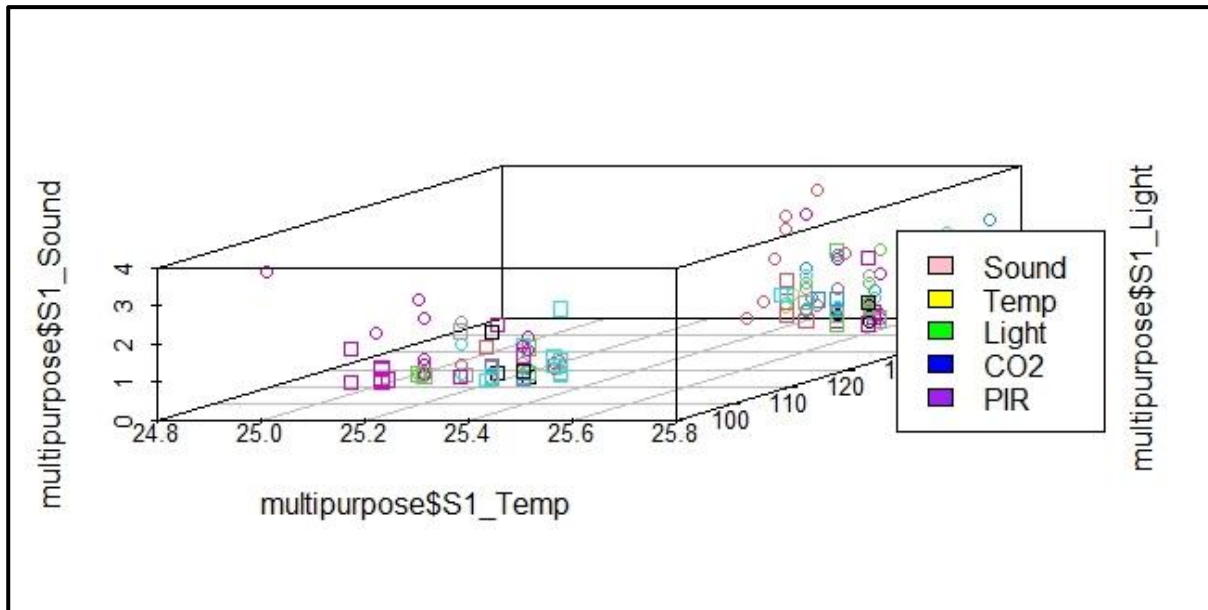


Figure 4 Scatter Plot representations on different sensors.

Figure 4 shows scatter plot for different sensors fix/placement to chair and based on the sample of 200 records and 19 fields.

6. Conclusion

Accordingly a novel IoT enabled multi-purpose chair will facilitate the users to control the home appliances locally and globally similarly, it detects the abnormal state of the health condition, of the users local and globally and finds the duration of the time that the person sitting on the chair for monitoring purpose.

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