ISSN No:-2456-2165

Smart System for the Blind

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Abstract:- The Smart Glasses System could be a device whose prime goal is to assist the blind man move more freely and simply without any difficulties. The system also will include a wise Cap which will detect the user temperature and alert if it exceeds. The purpose of this method basically is to assist the virtually impaired. As there are multiple smart systems like smart glasses, smartwatches, etc. present within the market. But all of them are built for physically fit person. there's a major lack of technology to help the physically challenged, so We wanted to create something that is useful for purblind people. So, we designed this low-cost system that may be able to help the visually impaired people.

I. INTRODUCTION

The human eye is an organ that provides us with sight, allowing us to determine the encompassing world, shapes, sizes, colors, and dimensions of objects by processing the reflection of light we recive. Good vision is an important factor for conducting daily life work because it is required in countless activities like reading, watching, communicating, working, etc.

Vision impairment directly impacts the standard of living since the absence of vision reduces proficiency and working speed in various activities. For instance, differing kinds of devices are proposed to facilitate mobility and living of the visually impaired with the advancement in modern technologies.

Visually impaired people do lead a normal life with their style of living. Social and infrastructural challenges are a major problem for them. Navigating around places is the biggest challenge for a blind person, especially a person with complete loss of vision. The blind person must be informed or asked about the changes made around them if they have a visitor or a person living with them. There is a lack of technology to aid the physically challenged so We wanted to build something useful for visually challenged people.

In this paper, we develop low-cost Smart Glasses which will help visually paired people navigate more easily. Also, the system will have a sensible cap that may prevent the user from getting a heat stroke with its smart early notification ability. Our objective is to make a system that may help the visually blind user to maneuver about and it'll also keep track of the temperature of the user by using the DHT-11 temperature and humidity sensor.

II. LITERATURE SURVEY

In[1] this paper the author has proposed low-cost smart glasses for the blind. With the assistance of this device, the blind person can feel the obstacle ahead of him easily and this can save them from accidents. This product is bought at a really low price rate. This product has been built with the help of waste. This makes blind people independent. These "SMART GLASSES" are designed for blind people. Obstacle detection by the SONAR sensor concept has been used here. the space of the obstacle is distributed to the Arduino and the data is given to user.

In [2]this paper, they proposed a compact and light-weight transmission system that assists the blind in interpreting signs. Our objective is to form them simple and low cost in order that they will be easy to use and affordable to everyone. The system is intended in order that it is less complex. The platform during this paper composes of a pair of smart glasses that may read signs which give warnings to the user to be careful.

In [3] this paper, they proposed a novel [7]smart glass for visually impaired people to beat their traveling difficulties. It could detect the obstacle and measure the distance perfectly with the help of ultrasonic sensor and a microcontroller. After receiving information from the sensor, it passes to the blind man through a headphone. This paper presents a singular smart device for visually impaired users, which can help them to travel anytime avoiding any kinds of obstacles indoor and outdoor environment. The proposed device was softer and less expensive.

In [4] this paper presents an interior navigation wearable system supported visual markers recognition and ultrasonic obstacles perception used as audio assistance for blind people. during this prototype, points of interest within the environment were identified by the visual markers; additionally with the information obtained in real-time by sensors the situation status is enriched. For indicating the gap and direction between closer points that building a virtual path employing a map that lists these points is employed. Glasses built with sensors like RGB camera, ultrasonic, magnetometer, gyroscope, and accelerometer are worn by the blind user.

The results show that increased quality in indoor navigation directed to the blind users contains a lot of gaps, room for improvement and that the approaches used are promising.

ISSN No:-2456-2165

In [5] this paper presents a completely unique application, Heat Watch,which predicts heatstroke and prevents heatstroke by ensuring users breaking and water intake. the applying estimates user's core temperature supported a personality's thermal model and vital sensors equipped with smartwatches. We also designed the application to trace users' water intake by desiring to apply existing activity recognition techniques to acceleration sensors inside a smartwatch. The results have revealed our method can instantly detect high temperatures exceeding 38.0! n with over 0.7 recall. The result also showed precision and recall dramatically increase after we accept some error of warning timing.

In [6] this paper heatstroke can cause great harm to the human body when exercising during a high-temperature envi- ronment. However, a runner isn't usually aware that a heat stroke is happening as they ignore important physiological warnings. to unravel this problem, employing a wearable heat stroke detection device (WHDD), this study evaluates a runner's risk of warmth stroke injury. Furthermore, the WHDD uses some filtering algorithms that are designed to correct the physiological parameters. Several people were chosen to wear the WHDD while conducting the exercise experiment to verify the effectiveness of the WHDD and investigate the features of these physiological parameters. The experimental results show that the WHDD can identify high-risk trends for heatstroke successfully from runner feedback of the uncomfortable statute and can effectively predict the occurrence of a heat stroke, thus ensuring safety.

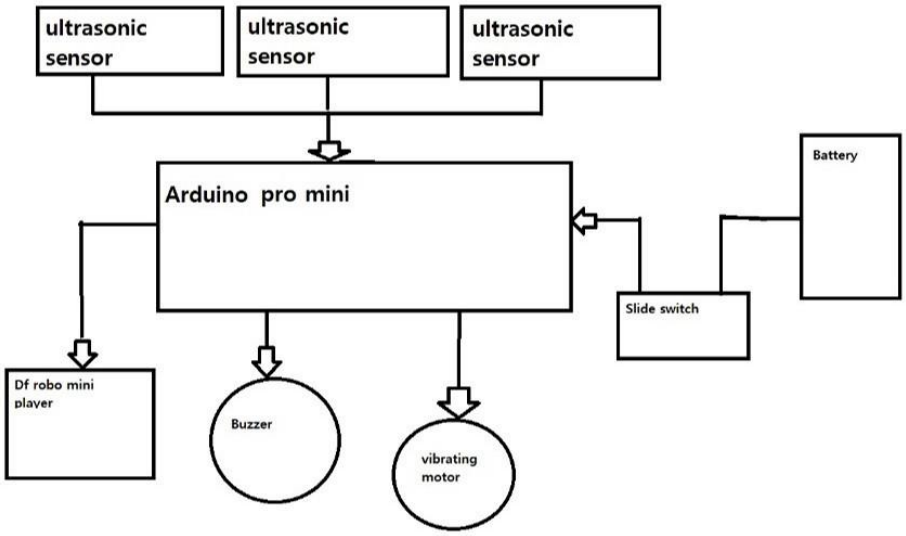

Fig. 1. Block Diagram of Smart Glasses and LM35 sensor send the reading to the Arduino mega and further, it tests the reading for the particular sensor. If the reading exceeds the specific value, the buzzer beeps. The basic idea behind the smart cap is, by using it the number of people getting heatstroke can be reduced giving a pre-notification.

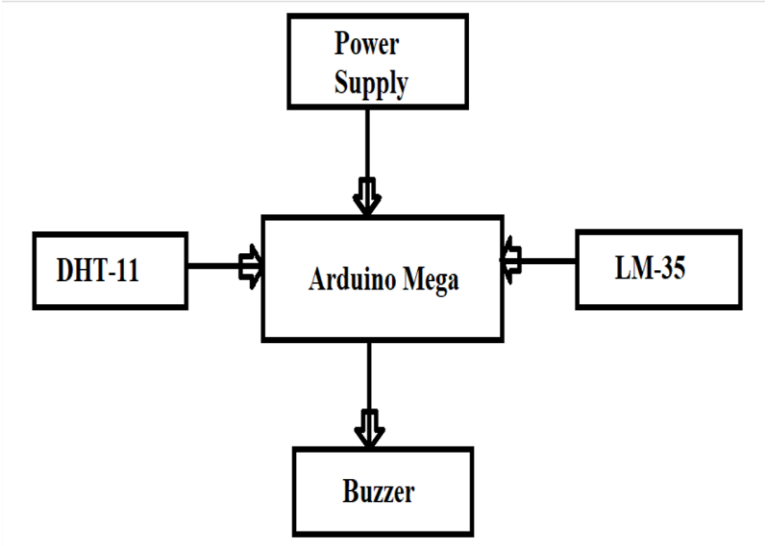

Fig. 2: Block Diagram of Smart Cap

ISSN No:-2456-2165

III. PROPOSED SYSTEM

A. *Smart Glasses*

The block diagram of our proposed model is shown in Fig.1. The system for the smart glasses consists of 3 Ultrasonic Sensors, battery, Arduino Pro Mini, DF Player mini, DF Robot, 3,5mm Audio jack, vibrating motor, buzzer and a slide switch. Three ultrasonic sensors are used on each side besides back of the system for improved detection. The DF Robot mini player lets the user know what direction the object is in centimeters, a Arduino Pro Mini which takes the information from the sensor about the distance of obstacle/object and processes the information accordingly and sends the output through the DF- Robot mini player, the power supply is given to distribute the power to different components. This will result in more accuracy and is user friendly.

B. *Smart Cap*

In Fig.2. The system consists of a power supply, Arduino mega, DHT-11, and a buzzer. The LM35 temperature sensor is used to detect the temperature, DHT-11 sensor is used to detect both the temperature and humidity of the user. It also contains a Power supply, Arduino mega, and a buzzer. The DHT-11

IV. PROPOSED METHODOLOGY

A. *PROBLEM DEFINITION*

Blind people face lots of problems in their day-to-day life. The biggest challenge for a visually handicapped person, especially the one with complete loss of vision, is to navigate around places. During summer, most of the people are busy and mostly ignore the effect of temperature on the body. 2020 was the second warmest year on record supported temperature data, and land areas were recorded warm. the ten warmest years on record have occurred since 2005. Therefore, the quantity of heatstroke's will increase gradually. The Smart Cap will help prevent such phenomena.

B. *PROPOSED ALGORITHM*

Description based recommendation: a sensible Smart Sys- tem for blind people comprises of a pair of wearable glasses, ultrasonic sensors - HC-05 for detection of obstacles in the way of blind person, a DF Robot mini player gives the audio as per the direction of the obstacle from the man, a central processing unit comprising of Arduino Pro Mini 328 which takes the data from the sensor about the obstacle distance and processes the data consistent with the coding is finished and sends the output through the DF-Robot mini player and a power supply is given to the system which distributes it to different components. The sensor is mounted in between the glasses. There's a Smart cap also included during this system which detects the temperature of the user and also the humidity using sensors like DHT-11 and LM-35. If the temperature exceeds the limit stored the buzzer will start to form sound. And via the Bluetooth module (HC-05) an alert are going to be sent to the user on their mobile on an app and make the user tuned in to the rise in temperature.

C. *FEATURES OF PROPOSED SYSTEM*

We are proposing to develop a device that will help blind people move around more freely. It will give the user infor- mation of how far an object is accurately in centimeters via ultrasonic sensors. This device will be price efficient and user- friendly. The project will also contain a smart cap consisting of a Bluetooth module to suffice the need for a wireless system. The system will use an LM-35 Temperature sensor and DHT- 11 Temperature and Humidity sensor which will notify the user via. Buzzer when the conditions around are extreme enough to trigger a heatstroke.

V. IMPLEMENTATION

The system starts after you turn on the switch. The ultra- sonic and the DHT-11 sensors then start taking input and sending the temperature and distance data to the Arduino board. There are three ultrasonic sensors (one for left, one for center, one for right). Each sensor will take three different values simultaneously. The Arduino board then converts the distance in centimeters and the temperature in degrees Celsius. The distance into centimeters is then sent to the DF Robo mini player which then lets the user know the value through any input component like headphones. The data from DHT-11 is first analyzed by the Arduino board and if the temperature increases or decreases by the default value stored then it triggers the buzzer letting the user know the temperature change.

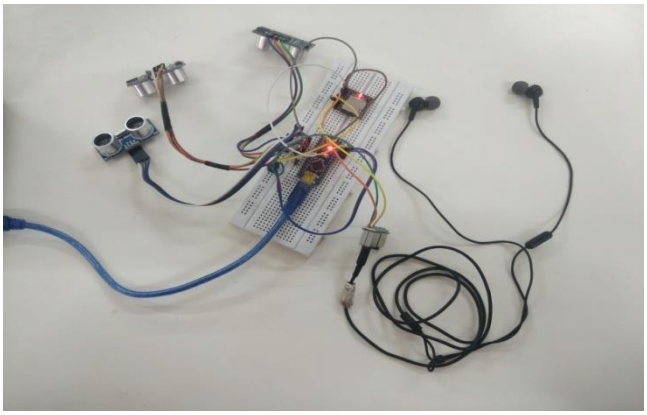

Fig. 3: Result 1

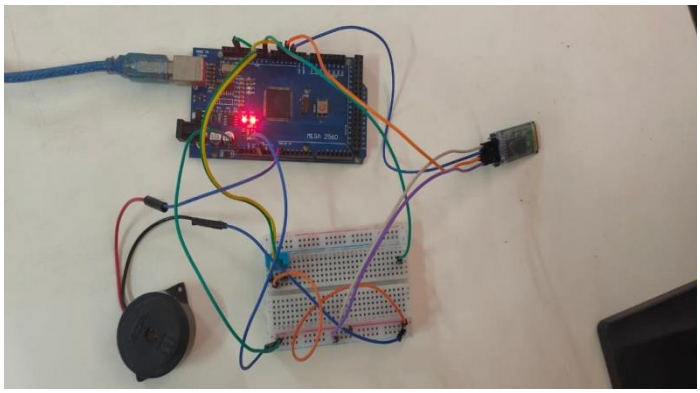

Fig. 4: Result 2

visually impaired users, which may help them move safely and efficiently in an exceedingly complicated indoor environment. Also, the smart cap will help prevent them from getting a heat stroke. The sensors employed in this technique are simple and with low cost, making it possible to be widely employed in the buyer market. the longer term Scope is that this method will be improved by including other sensors to live more certain parameters within the body and placement tracking may be added.

VI. RESULTS

The implementation is based on a smart-glasses and a smart cap. The glasses will be used by visually impaired users. Also, the smart glasses will be having a detachable smart cap to protect the user from getting a heat stroke. Low-cost smart glass that can be used to help the visually impaired move about more easily. The Smart cap prevents heat stroke with early notification ability. The device can notify the user when the temperature increases above the stored basic value via Buzzer. This can be used when the visually paired user goes in outdoor.

VII. CONCLUSION

This project aims at developing an application that aids the blind in being a help to them. a wise guiding device for

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