IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

BLIND MAN JACKET WITH HEALTH MONITORING SYSTEM

Dr. C Rangaswamy , Professor and HOD
Dept of Electronics and Communication
SJC Institute of Technology
Chikkabalapur, Karnataka,India

Hari Prasad N
Dept of Electronics and Communication
SJC Institute of Technology
Chickballapur,Karnataka, India

Hari Anirudh R
Dept of Electronics and Communication
SJC Institute of Technology
Chikkabalapur, Karnataka,India

Zakir N
Dept of Electronics and Communication
SJC Institute of Technology
Chikkabalapur, Karnataka, India

Abstract

The creation and application of a cutting-edge, specially made jacket with advanced health monitoring technology for people who are blind or visually impaired. Utilizing wearable sensors and IoT (Internet of Things) capabilities, the "Blind Man Jacket" offers real-time health monitoring to guarantee the user's safety and wellbeing. The system has sensors to monitor vital indicators, which are essential for early detection of possible health problems. These signs include blood pressure, body temperature, and heart rate. The jacket also has environmental sensors and GPS to help with navigation and warn the wearer of any hazards and barriers in their immediate area. In the event of an emergency, information gathered from the sensors is sent to a mobile application that is connected and can alert caretakers or medical personnel. The technical architecture, sensor integration, data processing techniques, and user interface design are all covered in detail in this article. We also go over the possible advantages and difficulties of implementing such a system, as well as upcoming developments and scalability issues. Through clever wearable technology, The Blind Man Jacket seeks to improve the health security and independence of those who are blind or visually impaired.

Keyword :- ultrasonic sensor, PIC microcontroller, navigation, and echolocation.

Introduction With the use of their other senses—such as touch and sound—blind people can overcome their lack of vision with the Smart Wearable Guiding Device for the Visually Impaired People. Vibrating signals and audible alarms warn the visually impaired user of a significant obstacle. The World Health Organization estimates that 39 million people worldwide are blind. They face numerous challenges in their daily lives. Therefore, the project's objective is to offer a low-cost, highly effective way to help the visually impaired navigate a little more quickly, easily, and confidently. The blind will be able to navigate without using a stick,

which may be uncomfortable for them, thanks to this Arduino-based device. They might simply use it as a jacket, and with little to no practice, it will operate pretty accurately. The system also includes a speaker that produces output in the form of sound and emits a warning sound. The user is alerted to potential threats by the system through sound and vibration signals. As the distance between the jacket and obstacles reduces, the frequency of both sound and vibration messages rises. In addition to a speaker that can provide voice output and a buzzer that sounds an audible alert, the design has the capability to send notifications to the right person in case of an emergency. Therefore, the goal of the project is to develop a low-cost, highly effective way to let blind individuals travel more confidently, quickly, and easily. This style offers a reliable, affordable, and transportable option for routes with a clearly fast reaction time. Think about how the ability to adjust to the information in the external atmosphere could be negatively impacted by an issue with the eyes, the body's principal sense organs. As the world's population ages, visual impairment is becoming a more important issue. Assistive technology is essential for helping people who are visually impaired get around in their daily lives. Being self-sufficient is a top objective for almost everyone in our technology age, when everyone wants to be self-sufficient in order to compete in a world of competition. There are 285 million persons with vision impairment worldwide, including 39 million blind individuals and a rising prevalence rate. The situation has improved, thus

notably, innovators have been concentrating more and more on health-care technologies in recent years.

Literature Review

Munmun Biswas et al[1] Visually impaired people face a lot of challenges in their day by day life. Due to blindness most of the time they depend on others for their daily movements. Many assistive technologies have been developed for blind people; most of them are expensive and designed in a complicated way. So in this paper, we represent a complete wearable navigation system for blind people based on the low expanse and truly subtle sensors, for example, Pi camera and Ultrasonic sensor. Live video analysis has been done to detect human faces and ultrasonic sensors are used to detect objects as obstacles. Raspberry Pi has been used as the main controller board. The indoor path has been pre- trained and saved in a database for blind assistance by voice command using Google Text To Speech so that blind people can navigate independently. In an emergency, the blind person can seek help from the specific person by sending SOS short message service (SMS)

through pressing an integrated button. This system has been tested continuously by both Blind folded and visually impaired people at various indoor locations. The outcome shows that it operates more efficiently than other assistive systems.

Yalla Mani Sai Suhith et al[2] In a world built on the ability to see also called as vision, the most dominant of our senses, is vital at every step of our lives. Visual deficit is basically a loss of basic functions of the eye and the visual system. The visually impaired can be blind or partially impaired. According to a study by the World Health Organization (WHO), our vision is one of the important senses. Yet, as the report by World health organization shows, eye disease and vision impairment are widespread and all too often still untreated. Globally, at least 2.2 billion people have a visual impairment. In our project we came up with a productive, efficient and low-price prototype which can fit into the cloth for visually impaired people, which will help them to detect the barrier and navigate safely. The sensors in our prototype will sense and detect the objects nearby, which will help visually Impaired person to know better and act accordingly, so our project can be user real-time for visually impaired people.

Shreyas Joshi et al[3] Despite of many advancements in medical tools, technology for overcoming blindness is still limited. Blind people mostly rely on the symbolic white cane for the purpose of navigation, which is very primitive. It is necessary to provide them a better option. Sensing systems like LIDAR, echolocation and infrared proximity are used in some navigation tools developed recently. In the proposed system, the design and implementation of a navigation jacket for blind people is carried out using PIC microcontroller. Using the principle of echolocation, ultrasonic sensors are used to detect the presence of obstacles around the visually impaired user.

DESIGN AND ARCHITECTURE

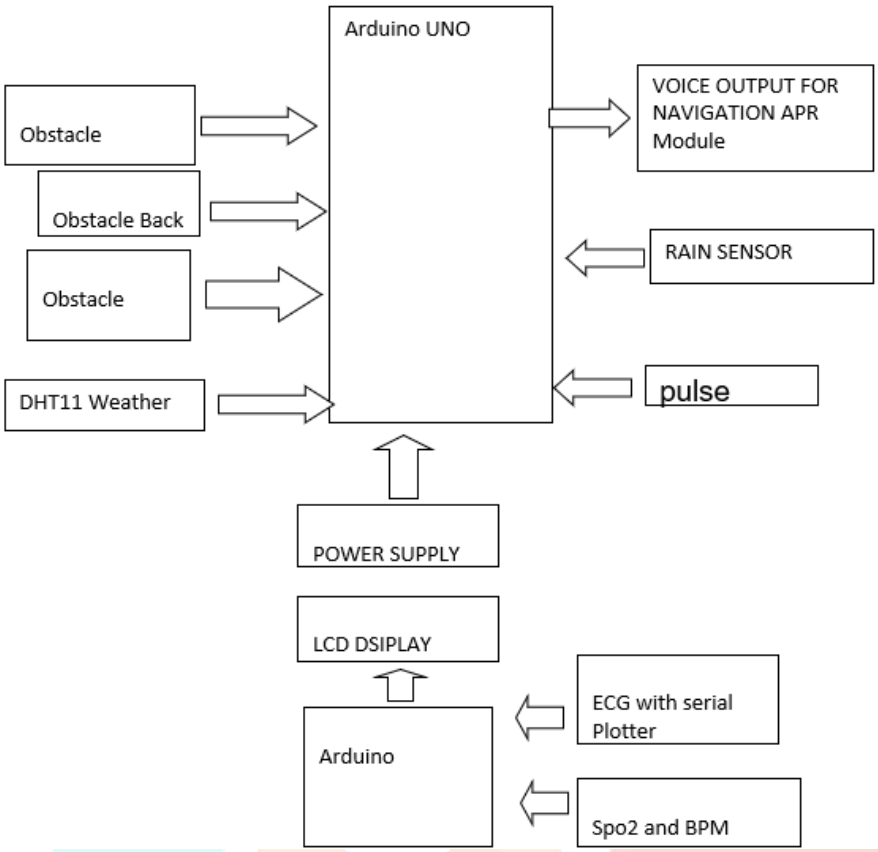

Figure 1 Block Diagram of Blind man jacket with health monitoring system.

Figure 1 shows that block diagram of electronic jacket for blind people. It is difficult forvisually impaired people to recognize barriers in their environment, causing them to fall behind in the increasingly complex urban world. This concept is created specifically for blind individuals to make day-to-day tasks simpler. This technology is created with the goal of preventing visually impaired people from getting into accidents when driving alone on the road and allowing them to distinguish objects in their environment. The continually thinking about eliminating the functionality of walking canes at the start of the design process in order to give a better walking experience for blind individuals. The concept canfully avoid the use of the white stick and other similar devices if the blind people wear thisdevice. Wearing the device as a cloth, and it will operate correctly. Blind people need almost little preparation to use it because it is so simple. The proposed system includes components such as an Arduino UNO, ultrasonic sensor, vibrating motor, voice recognitionmodule, buzzers for obstacle detection and alerting the user, a GSM Module in the event of an emergency, Radar, Red LED, Jumper cables, Lithium-ion battery, and some elastic and stickers to make the device wearable. The device includes the following components:

Arduino UNO - Ultrasonic Sensor - Buzzer - Mini vibration motor - GSM Module - 5mmRed LED - Jumper wires - Battery – Wearable jacket- Arduino Software A complete hardware model is a process of creating a model whose goal is to detect an obstacle or itemwithin a given range, with the range value set in the application. Sensors are positioned along a route to detect obstacles or items. When the visually impaired discovered, the vibrating motor and buzzer switch on, allowing the individual to pursue a different course.The proposed system is designed to provide a low-cost, high-performance obstruction detection system. As a consequence, because it will be a portable gadget, the Smart Wearable Guiding Device for

the Visually Impaired People will make navigating and identifying obstructions while moving a lot easier and more pleasant for the user. The Arduino is an open-source hardware and software platform that allows users to do useful tasks. This microcontroller gadget assists in the detection and control of objects in real-time scenarios and environments. The ultrasonic sensor is made up of three parts: a transmitter, a receiver, and a transceiver. Electrical signals are converted into sound wavesby the transmitter. The sound waves are converted back into electrical signals by the receiver. The reception and transmitter functions are performed by the transceiver. It also has crystal oscillators. A beeper or buzzer is an auditory signaling device that can be electromechanical, piezoelectric, or mechanical. This mini-computer can be programmed to interact with sensors that detect changes in blood volume (pulse sensor) and blood oxygen levels (MAX30102 sensor). The Arduino processes the raw signals from these sensors to extract heart rate and SPO2 values. While an LCD display can show these readings in real-time, you can even modify the code to store data on an SD card for further analysis. It's important to remember that such Arduino-based monitors are for informational purposes only and shouldn't be used for medical diagnosis. Additionally, sensor readings might not be as accurate as professional equipment, and the project itself requires some electronics and programming knowledge. If you're interested in building one, there are many online resources with tutorials and code examples to guide you. Just remember to start with simpler Arduino projects to build your skills before venturing into health monitoring. And most importantly, consult a doctor for any health concerns you might have.

Result

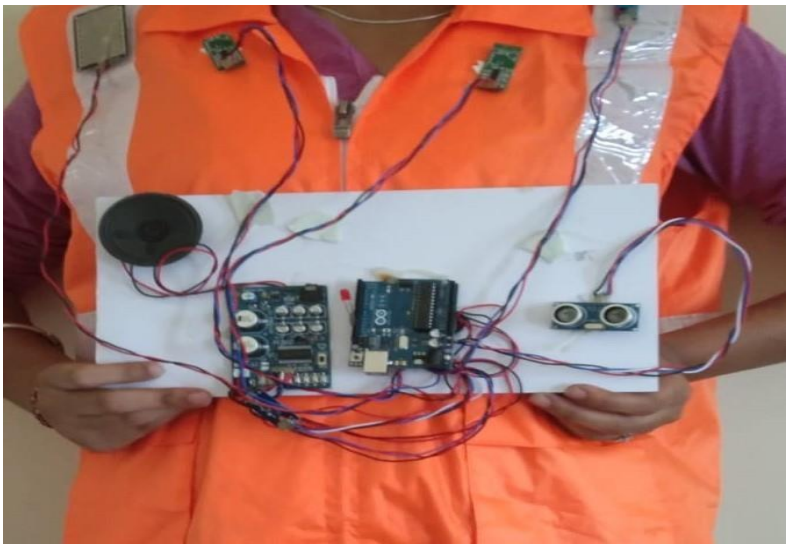

Figure 2 Final Hardware

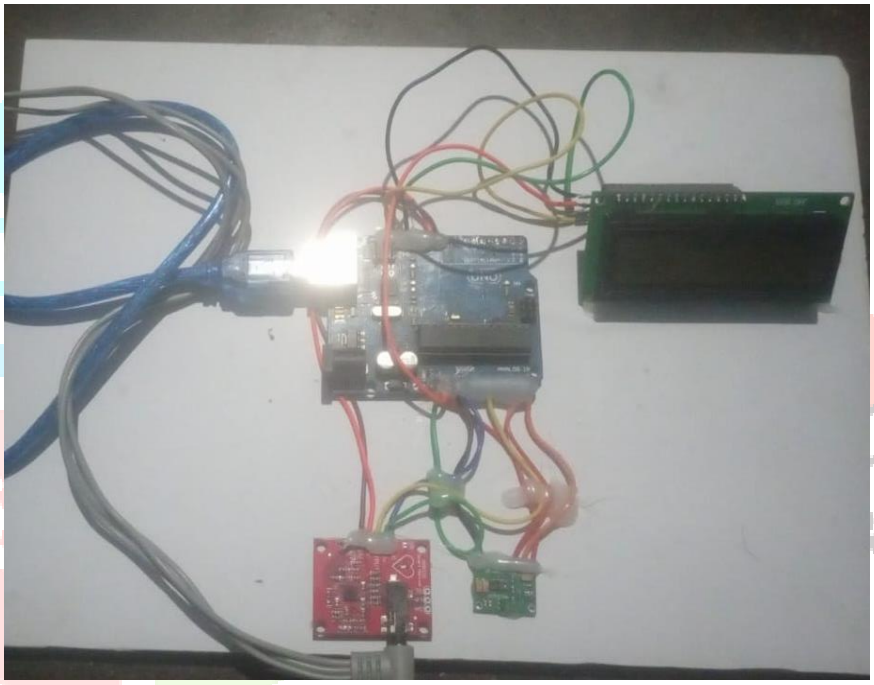

Figure 3 Health monitor system

Figure 2 shows the top view of the model, where all the connection are made according to the block diagram of the system. When the system is powered up the components will start detection, this type of communication technique enhances its range of operation, where theuser can navigate according to the information by the components, when compared to earlier works in this the main thing is the radar it can detect in which direction and in how much speed it is arriving, then the jacket where it is comfort to wear and carry because the stick can be stolen or it can be missed but the jacket is cannot be done like that very comfort.

Test case

Sl.no	Case	Expected result	Actual result
1	Moving object detected	Radar detected	Radar detected
2	Stationary object detected	Ultrasonic detected	Detected by ultrasonic
3	Temperature sensing	Dht11 sensor recognized the temperature is hot or cold	Dht11 sensor detected
4	Rain drops detected	Rain drop sensor detected	Rain is detected by sensor
5	Heart beat detected	Pulse sensor and MAX30102 detected	Heart beat is detected by sensor
6	Spo2 detected	Pulse sensor and MAX30102 detected	Spo2 is detected by sensor

APPLICATIONS

- The jacket works as a navigation device for the blind people.
- The system can be used to navigate by everyone not only visually impaired under certain circumstances, like foggy mornings with low visibility. Some winter mornings are foggy, where the visibility is very low, then this system can be used.
- The system can also be used by patients suffering with various eye ailments like cataract, exophthalmia, post eye operative situations and others.
- The system can be modified into a more sophisticated version of itself by using high intensity ultrasonic waves to be used as a navigation system for geological explorations.

ADVANTAGES

- Guide blind people.
- Alerts through voice based messages system.
- Obstacle detection using ultrasonic distance finder sensor.
- Efficient low cost design.
- Low power consumption.

CONCLUSION

Electronic jackets for visually impaired individuals hold immense promise in enhancing their mobility and independence. By incorporating sensors like ultrasonic detectors, these jackets can create a virtual shield, alerting wearers to potential obstacles through vibrations or sounds. This not only improves navigation but also fosters a sense of security. Further advancements in areas like integration with GPS and refinement of feedback mechanisms can create a comprehensive guidance system. While not a replacement for existing tools like guide dogs, electronic jackets offer a powerful supplementary technology to empower blind and visually impaired people to explore their surroundings with greater confidence.

REFERENCE

[1] Munmun Biswas, Tanni Dhoom, Refat Khan Pathan and Monisha Sen Chai, A Shortest Path Based Trained Indoor Smart Jacket Navigation System for Visually Impaired Person, vol 8 and issue 12, IEEE 2022 , pp 225-238.

[2] Yalla Mani Sai Suhith, Jathin Kolla, Shinde Praneeth, Kamuju Abhi Subrahmanyam and Manchiryala Samanvitha Jacket For Visually Impaired IJRTI , vol 7, issue 7,April 2022, pp 1-15.

[3] Shreyas Joshi, Nikhil Kanawade, Manisha Gaikwad, Ramgopal Sahu and Kirthi Adoni, Navigation Jacket for visually impaired people (IRJET) , vol 07, issue 04 Apr 2020, pp 2-4.

[4] K P Venkat Vivek, J Vandana, K Sripooja and Abhishek Choubey , A Smart Wearable Guiding Device For the visually impaired people, IJRASET, vol 10, issue VI, June 2022, pp 75-80.

[5] Aline Darc Piculo dos santos, Ana Harumi Grota Suzuki, Fausto Orsi Medola, and Atiyeh Vaezipour, Systematic Review Of Wearable Devices For Orientation and Mobility of Adults with Visually Impairment and Blindness, IEEE Access ,vol 19, issue 19, pp 5-17.

[6] B Satish Kumar, J Dileep, S N A Ashitha, A L Sneha and S N Thoshitha , Electronic Smart jacket for the navigation of deaf-blind people International Journal of Advanced Research in computer and Communication Engineering , vol.11, issue 6, June 2022, pp 1-10.

[7] M Hersh Wearable, Travel Aids for Blind and Partially Sighted People A Review With a Focus on design Issues Sensors , vol 22, issue 8, 2022, pp 7-9.

[8] J Calder and David curtin, An obstacle signalling system for the blind, Digital ecosystem and Technologies , Conference (DEST), vol 18, issue 7, June 2022, pp 2-4.

[9] R R Bourne, Flaxman, S R Braithwaite, T Cicinelli, M V Das, A Jonas, J B and K Naidoo, Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment, The Lancet Global Health, 5(9), pp 888-897.

[10] The Financial Express Visual impairment to increase dramatically study. Retrieved from impairment- to increase - dramatically - study- https://thefinancialexpress.com.bd/health/visual- 1579444915(2020).

[11] W R Wiener, R L Welsh and B B Blasch , Foundations of orientation and mobility A smart blind stick for impaired people vol 8, issue 10, June 2020, pp 5-6.

[12] R V Jawale, M V Kadam, R S Gaikawad and L S Kondaka, Ultrasonic navigation based blind aid for the visually impaired. IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), 2022, pp 923- 928.

[13] C K Lakde and P S Prasad. Navigation system for visually impaired people. International Conference on Computation of Power, Energy, Information and Communication (ICCPEIC), pp 0093-0098.

[14] R C Bryant, E J Seibel, C M Lee and K E Schroder, Low- cost wearable low- vision aid using a handmade retinal light- scanning microdisplay, doi 10.1889/1.1847738, vol. 12, issue 4, pp 397–404.

[15] S Caraiman, O Zvoristeanu, A Burlacu, and P Herghelegiu, Stereo Vision Based Sensory for the Visually Impaired, Sensors, vol. 19, issue 12, 2016, pp 769- 771.