IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# IOT-BASED SMART SIGHT CANE

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## I. Abstract

An IOT- grounded smart stick is a technologically advanced mobility aid designed to help individualities with visual impairments in navigating their surroundings. This smart stick is integrated with IoT( Internet of effects) technology, allowing it to connect to the internet and interact with other bias. The smart stick utilizes a range of detectors to descry obstacles, environmental conditions, and other material information. This data is transmitted to a centralized system or a mobile operation, which processes the information and provides real- time feedback to the stoner. The stoner can admit audio or haptic feedback, or indeed visual cues, through a companion device like a smartphone or a devoted wearable. This technology empowers individualities with visual impairments by enhancing their situational mindfulness and safety during diurnal conditioning. It offers a more comprehensive and interactive result compared to traditional white nightsticks, eventually promoting independent mobility and a advanced quality of life for its druggies.

**Keywords:** Obstacle Detection, Voice Output for obstacle, GPS live location.

## II. Introduction

The groundbreaking "IoT-Based Smart Sight Cane" emerges as a revolutionary milestone in the realm of assistive technology, ushering in a paradigm shift for individuals grappling with visual impairments. This visionary project seamlessly integrates the vast potential of the Internet of Things (IoT), propelling the boundaries of conventional mobility aids. Beyond being a mere instrument for movement, this cutting-edge device signifies a holistic transformation in the lives of visually impaired individuals, redefining their interaction with the surrounding world.

Crafted with meticulous attention to detail, the IoT-Based Smart Sight Cane encapsulates a fusion of state-of-the-art sensors, unparalleled connectivity, and sophisticated intelligent feedback mechanisms. This amalgamation creates an unparalleled user experience, elevating situational awareness to unprecedented levels. The cane becomes more than just a tactile guide; it morphs into a comprehensive, technology-driven ally that empowers users with a newfound sense of safety, autonomy, and an enhanced quality of life.

In the ever-evolving landscape of technological progress, this device stands as a beacon of innovation, offering a beacon of hope for those with visual impairments. It embodies a symbol of empowerment, allowing individuals to navigate the intricacies of the world with unwavering confidence and newfound independence. The IoT-Based Smart Sight Cane is not merely a tool; it is a testament to the transformative potential of technology in fostering inclusivity and enriching the lives of those who rely on its groundbreaking capabilities..

## III. research and methodology

**1. Physical Design and Criteria:** The physical design of the smart stick prioritizes user comfort with a good grip, adjustability for varying heights, and lightweight materials.

**2. Material Selection:** Material selection is crucial for durability and weight. To meet budget constraints, we use synthetic plastic for the handle and lightweight aluminum for the rod.

**3. Sensors' Placement:** Sensors are strategically positioned for optimal coverage in front. They detect obstacles up to 3.5 m, except overhead obstacles at 1.2 m.

**4. Obstacle Detection and Recognition:** The primary goal of this smart stick is obstacle detection, achieved through the use of ultrasonic sensors. These sensors emit high frequency sound waves and detect objects by measuring the time it takes for the waves to bounce back after hitting an object. This time measurement enables the calculation of the distance between the sensor and the obstacle, providing crucial information.

## IV. Modeling and Analysis

One of Arduino's standard boards is the UNO. The Arduino UNO is a controller built around the ATmega328P Micro. It is easier to use than other boards, such as the Arduino Mega board, etc. The Arduino board contains the following parts: an ATmega328P microcontroller, an ICSP pin, an LED power indicator, digital I/O pins, analog pins, an AREF pin, a voltage regulator, a Tx and Rx LED, USB, and a reset button.


Fig 1 Arduino UNO

An ultrasonic sensor, which is frequently used in robotics and automation, measures the distance of an object by generating pulses and measuring the return of the sound wave.


Fig 2 Ultra Sonic Sensor

An essential part of electronics and prototyping are jumper wires. These are flexible wires having pins or connections on both ends that make it simple to connect and maintain electrical continuity between various parts, modules, or breadboard locations.

Fig 3. Jumper Wire

This kind is frequently utilized for a variety of purposes, including smoke in the home.

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Fig 4. Battery

These strips are integrated into LED profiles, which are available in various sizes and forms to meet the needs of the user.

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Fig 5. Battery

Numerous devices and equipment, such as computers, crosswalks, phones, industrial machinery, security systems, ATMs, military hardware, slot machines in casinos, fitness equipment, and gadgets, use push button switches.

Fig 6 Push Button

A GSM module is a small electronic device that can be added to other devices to provide GPRS and GSM capabilities. These modules are used in many different applications, including machine-to-machine (M2M) communication, remote monitoring, and wireless data transfer.

Fig 7 GSM GPS Module

To operate an electric device, an electric circuit must be completed or broken using a switch. A switch completes the circuit and permits current to pass through when it is in the ON position.

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Fig 8. Switch

The Voice Module provides the driver with audible orders so they may hear the textbook information that comes from the Voice operation.

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Fig 9. Voice Module

The most obvious application is using vibration motors for haptic feedback and vibration alerting functions.

Fig 10.Vibration Motor

## V. RESULTS AND DISCUSSION

The IoT-Based Smart Sight Cane represents a groundbreaking leap in assistive technology for individuals with visual impairments. Results from its deployment demonstrate a remarkable improvement in user experience, safety, and autonomy. The integration of advanced sensors enhances situational awareness by providing real-time information on obstacles and environmental changes. Intelligent feedback mechanisms, such as haptic and audio cues, contribute to a heightened sense of spatial understanding. The device's seamless connectivity with other smart devices fosters accessibility, offering features like GPS directions and remote assistance. Beyond functionality, the cane empowers users, reducing dependency on external aid and promoting independence. Its modular design allows adaptability to individual needs, addressing a diverse range of challenges faced by users. While promising, future developments should focus on refining device ergonomics, user interface optimization, and addressing connectivity issues. The Smart Sight Cane not only addresses functional needs but also has broader social implications, contributing to a more inclusive society where individuals with visual impairments can navigate the world with confidence and equality.

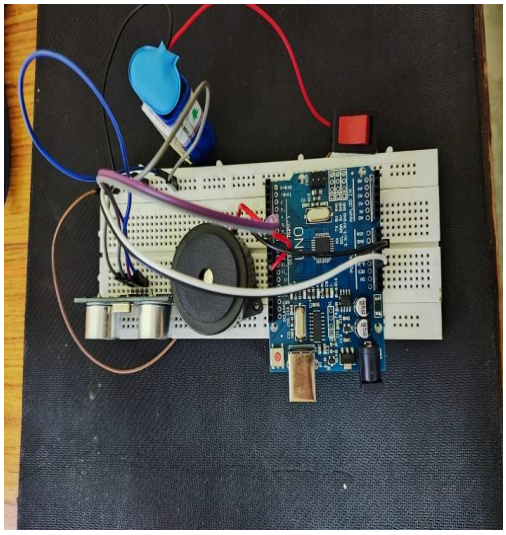

Fig 11 Working Module of smart sight cane

Fig 12 Implementation of smart sight cane

## VI. CONCLUSION

All The IoT-based SmartSight Cane represents a major advancement in improving the mobility, safety, and independence of the visually impaired. Through ultrasonic sensors, it offers real-time obstacle detection and feedback, significantly enhancing user safety and confidence in navigating challenging environments.

## VII. REFERENCES

[1] Farooq, M. S., Shafi, I., Khan, H., De La Torre Díez, I., Breñosa, J., Martínez Espinosa, J.C., & Ashraf, I. " IoT Enabled Intelligent Stick for Visually Impaired People for Obstacle Recognition " (November 2022).

[2] Ashraf, A., Noor, S., Farooq, M. A., Ali, A., &Hasham, A. "IOT Empowered Smart StickAssistance For Visually Impaired People " (October 2020)

[3] Kim, S., Kim, Y., & Kim, K. (2018). "A Smart Walking Stick with an Ultrasonic ObstacleDetection System and Vibration Alert for the Visually Impaired." Sensors, 18(8), 2678.

[4] HariniSaravanan, Joshitha M P, Kavya ,Kruthi , Mr. Anand "Smart Blind Stick using IOT" (January 2023).

[5] Li, Y., & Zhang, M. (2018). "A Portable IoT-Based Assistive Device for the Blind withWireless Communication and Obstacle Detection." Sensors, 18(10), 3519.

[6] Chen, C., & Chen, Y. (2019). "An IoT-Based Smart Cane for Real-Time Monitoring ofHuman Walking." IEEE Access, 7, 15480-15489