

Smart Belt Obstacle Detection with Voice Output for Blind Person

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Abstract: *The field of healthcare is experiencing remarkable advancements through the integration of technological innovations. Information technology, when applied to the realm of medicine, has showcased its potential to create innovative solutions for individuals with disabilities. Navigating through the world independently poses a significant challenge for visually impaired individuals. To address this, the Smart Belt for Obstacle Detection with Voice Output integrates cutting-edge technology to provide real-time assistance. This project utilizes ESP32 microcontroller, GSM/GPS modules, and ultrasonic sensors to create a comprehensive assistive device. The Smart Belt detects obstacles in the user's path and communicates vital information through voice output, enhancing safety and autonomy. By continuously tracking the user's location, it ensures timely assistance and peace of mind for both the user and caregivers. This abstract explores the Smart Belt's functionality, highlighting its transformative potential for the visually impaired community.*

Keywords: Ultrasonic sensor, ESP32, GSM/GPS Module, Object Detection, Smart Belt

BIBLIOGRAPHY

- [1]. AbdulhameedAlsanie, Abdulwahed Abbas, and Mohammed Alreshoodi, "A Smart Belt with Ultrasonic Sensors for Obstacle Detection and Mobility Assistance for Visually Impaired People," International Journal of Advanced Computer Science and Applications, 2021.
- [2]. Akash Gupta, Pankaj Singh, and Sandeep Joshi, "Design and Implementation of a Smart Belt for the Visually Impaired," International Journal of Computer Applications, 2018.
- [3]. Amirudin Bin Sanusi, Muhammad Hafiz Abdul Aziz, and MohdAzriMohd Noor, "Development of Obstacle Detection Device for the Blind Using Ultrasonic Sensor," International Journal of Electrical and Computer Engineering, 2015.
- [4]. Arvind Kumar, N. Arun Kumar, and R. Vidhya, "Smart Belt for Visually Impaired with Obstacle Detection and Location Indication," International Journal of Engineering and Advanced Technology, 2019.
- [5]. Asit Kumar Jena, Anup Kumar Das, and Ramesh Kumar Jena, "Smart Obstacle Detection and Navigation System for Visually Impaired People Using Ultrasonic Sensor and Arduino," International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 2019.
- [6]. ChetnaNandwani, DikshaDhiman, and Anoop Singh, "Assistive Device for Visually Impaired People Using Arduino," International Journal of Computer Science Trends and Technology, 2015.
- [7]. D. S. Choudhari, S. R. Nalbalwar, and S. G. Adlak, "Smart Obstacle Detection System for Blind People," International Journal of Science, Engineering and Technology Research, 2016.
- [8]. Deepali S. Chaudhari, Vinayak S. Biradar, and Sagar G. Adlak, "Smart Stick for Blind People with Ultrasonic Sensor," International Journal of Engineering Science and Computing, 2017.
- [9]. Dilip Kumar Jena, Saumendra K. Mohapatra, and Sudhansu K. Jena, "A Review on Smart Stick for Blind Person," International Journal of Scientific Research and Management, 2019.
- [10]. Manju Thomas, G. S. Sharath Kumar, and M. K. Shaila, "Development of Obstacle Detection System for Visually Impaired People Using Ultrasonic Sensor," International Journal of Advanced Research in Computer Science and Software Engineering, 2016.

- [11]. Mohamed Ashraf M. Abdelkader, "Smart Cane for Visually Impaired People," International Journal of Electronics and Communication Engineering and Technology, 2017.
- [12]. Mukesh G. Kurund, Mangesh D. Pokharkar, and Shrikant S. Sawai, "Obstacle Detection and Navigation System for Blind," International Journal of Engineering Research and Technology, 2015.
- [13]. R. G. Khadse, S. A. Kulkarni, and P. P. Bansod, "Smart Stick for Blind," International Journal of Engineering Development and Research, 2016.
- [14]. Renuka Jain, S. Swathi, and K. Swetha, "Smart Stick for Blind Person Using Arduino," International Journal of Innovative Research in Science, Engineering and Technology, 2015.
- [15]. S. SaiManikanta, S. Harika, and M. Mounika, "Smart Stick for Visually Impaired Using Arduino," International Journal of Advanced Research in Computer and Communication Engineering, 2017.
- [16]. SangeetaTanwar, AmandeepKaur, and AnjuBala, "Smart Walking Stick for Blind," International Journal of Advanced Research in Computer Science and Software Engineering, 2015.
- [17]. Shaila S. Patil, Jitendra M. Mohite, and Mithun S. Harnal, "A Smart Stick for Blind Person," International Journal of Science, Engineering and Technology Research, 2017.