



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 4, April 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

 ijirset@gmail.com

 www.ijirset.com



Smart Glasses for Blind People

Abhishek Badade¹, Yash Sarode², Misba Shaikh³, Kamlesh Tambe⁴, Prof.A.E.Kachare⁵

U.G. Student, Department of Electronics and Telecommunication Engineering, Amrutvahini Collage of Engineering,
Sangamner Maharashtra, India¹

Department of Electronics and Telecommunication, Amrutvahini collage of Engineering, Sangamner,
Maharashtra, India^{2,3,4,5}

ABSTRACT: Visual impairment is a significant challenge for many individuals, especially in today's society where information is primarily communicated through text messages (electronic and paper based) instead of spoken words. To address this issue, we have developed a tool to assist people with disabilities. Our device converts the text in an image into speech. The underlying framework is an embedded system that captures an image, extracts the region of interest containing the text, and converts it to an audio format. We used a Raspberry Pi and a Raspberry Pi camera to implement the system. The captured image goes through several pre-processing steps to isolate the text region and remove the background. We utilized Optical Character Recognition (OCR) software and Text-to Speech (TTS) engines to convert the text into speech. The audio output is played through the Raspberry Pi's audio jack and can be routed to speakers or headphones.

KEYWORDS: Raspberry Pi 3B++,Raspberry Pi Camera module, Speaker/headphones, Battery, Push Button.

I.INTRODUCTION

1.Many people in our society suffer from various disabilities or illnesses that make their lives challenging. These individuals require assistance to improve their quality of life, and there are specialized schools and universities that cater to their specific needs. However, not all disabilities require attending specialized institutions, and with the right opportunity, individuals with disabilities can study alongside regular students. Unfortunately, most blind and partially sighted individuals have not attended college due to the limited availability of specialized schools or the high costs of private institutions. "Smart Glasses" aims to help these individuals by introducing a new technology that enables them to read written text. The glasses use a camera to scan any written text and convert it into audio. This technology has a wide range of applications and can greatly benefit the education of visually impaired individuals. With "Smart Glasses," blind or partially sighted individuals can read, study, and learn from any printed text or image, empowering them to succeed in various fields. Existing technology often presents difficulties with alignment, focus, accuracy, mobility, and efficiency when accessing print materials, making "Smart Glasses" a much-needed solution. The project's methodology is based on preliminary studies with the visually impaired and utilizes a small-scale design that requires minimal setup for ease of use. Overall, "Smart Glasses" can significantly improve the lives of individuals with visual impairments by making education and other areas more accessible.

II.RELATED WORK

2. To understand how the smart glasses work, it is essential to know their components. The glasses comprise a Raspberry Pi 3 powered by Android Things, a camera, and a button. When the user presses the button, the Sight takes a picture and uses TensorFlow to analyze the image and identify the contents. The Sight then uses a speaker or headphones to provide voice assistance to the user regarding the picture.

3. Eyesight is a creation of the Spanish company, Eyesite, and Marcelo Alegre, a designer who worked for Google. These special glasses are equipped with 3D cameras that enable a volumetric analysis of the scene, and the information is then processed to produce abstract sound that provides details about the object's position, size, and shape.



III.METHODOLOGY

4.Firstly, the power supply is provided to the Raspberry Pi, which then distributes the power to other components such as the speaker, push button, and camera. When the push button is pressed, the camera captures the image. The image is then passed to the Raspberry Pi, where we have implemented OCR techniques to convert the text into machine-understandable code. After the text is converted, the Raspberry Pi converts it into a voice format and sends it as input to the speaker. Finally, the speaker receives the input from the Raspberry Pi and gives the output in audio format.

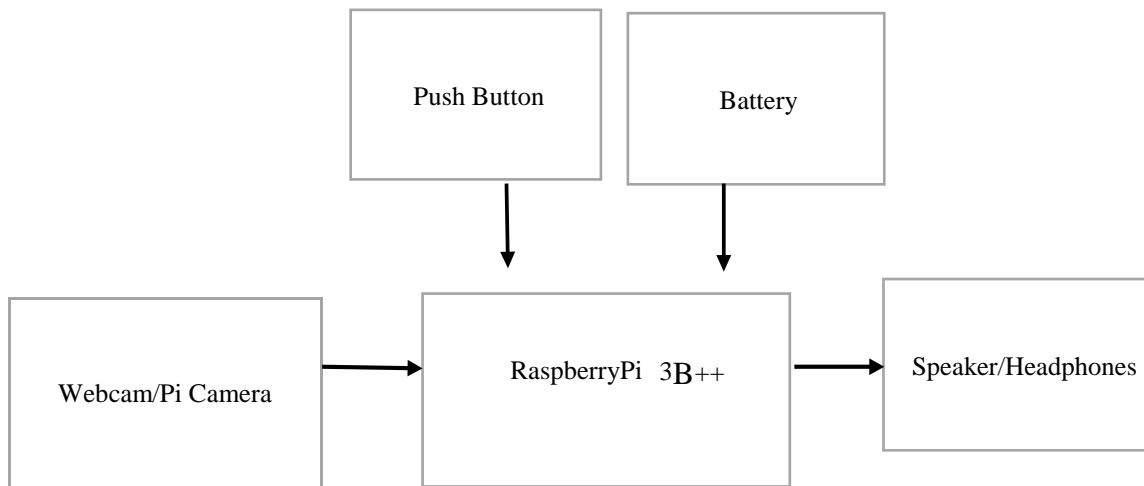


Fig 1: Block Diagram of System

+

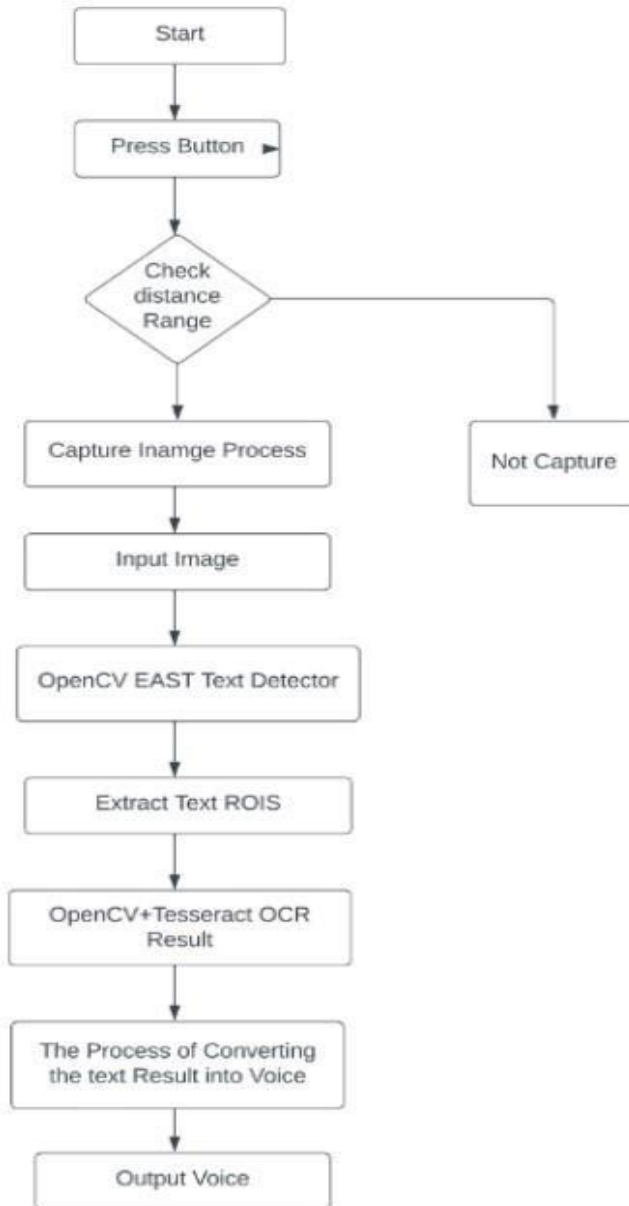


Fig 2: Flowchart of System

SOFTWARE REQUIREMENT –

- THONNY
- PROTEUS 8 PROFESSIONAL



•Raspberry Pi 3B++

The Raspberry Pi 3 is a versatile device that can be used for various purposes such as education, coding, and building hardware projects. In this project, the Raspberry Pi 3 is the main component that is used as a low-cost embedded system to control and connect all of the components together. It can run various operating systems such as Raspbian or NOOBs and can accomplish many important tasks. However, for this particular project, the team has decided to work on Raspbian as the operating system.



Fig 3:Raspberry Pi Model 3 B++

IV.EXPERIMENTAL RESULTS





V. CONCLUSION

The smart spectacles are specifically designed for visually disabled people to help them live a more confident and independent life. These glasses can assist them in safely navigating their surroundings by detecting nearby objects, and also enable them to read any type of written text in their environment, including textbooks. Our prototype system uses Optical Character Recognition technology to recognize characters in published textbooks and converts them into speech for the visually impaired. The device is portable and does not require an internet connection, making it accessible to individuals. Technology plays a significant role in our lives, and its rapid development demonstrates that we should not give up on overcoming our disabilities. By using technology effectively, we can achieve success that benefits not only individuals but also society and the entire country.

REFERENCES

1. Wang, T., Wu, D. J., Coates, A., & Ng, A. Y. (2012, November). End-to-end text recognition with convolutional neural networks. In *Pattern Recognition (ICPR), 2012 21st International Conference on* (pp. 3304-3308). IEEE.
2. Koo, H. I., & Kim, D. H. (2013). Scene text detection via connected component clustering and nontext filtering. *IEEE transactions on image processing*, 22(6), 2296-2305.
3. Bissacco, A., Cummins, M., Netzer, Y., & Neven, H. (2013). Photoocr: Reading text in uncontrolled conditions. In *Proceedings of the IEEE International Conference on Computer Vision* (pp. 785-792).
4. Yin, X. C., Yin, X., Huang, K., & Hao, H. W. (2014). Robust text detection in natural scene images. *IEEE transactions on pattern analysis and machine intelligence*, 36(5), 970- 983.
5. Neumann, L., & Matas, J. (2012, June). Real-time scene text localization and recognition. In *Computer Vision and Pattern Recognition (CVPR), 2012 IEEE Conference on* (pp. 3538- 3545). IEEE.
6. Neumann, L., & Matas, J. (2013). Scene text localization and recognition with oriented stroke detection. In *Proceedings of the IEEE International Conference on Computer Vision* (pp. 97-104).
7. Zhou, X., Ylao, C., Wen, H., Wang, Y., Zhou, S., He, W., & Liang, J. (2017). EAST: an efficient and accurate scene text detector. In *Proceedings of the IEEE conference on Computer Vision and Pattern Recognition* (pp. 5551-5560).



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.423



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

9940 572 462 **6381 907 438** **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details