IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 7.39 ⁜ Vol. 11, Issue 4, April 2022

DOI: 10.17148/IJARCCE.2022.11413

Smart Vision: Vision For The Visually Impaired

Disha Ghule[1], Shital Gaikwad[2], Ankita Jadhav[3], Sonali .N. Mhatre[4]

Student, Information Technology, Bharati Vidyapeeth College of Engineering, Navi Mumbai, India[1-3]

Professor, Information Technology, Bharati Vidyapeeth College of Engineering, Navi Mumbai, India[4]

Abstract: Smart Vision is an assistant for blind people which provides the outline of their environment. The smart vision aims to bring the attractive world as a narrative to the visually impaired. The narrative is generated by converting the scenes within their surrounding to text which describes the important objects in the scene. samples of text include 'Children playing within the garden', 'people walking', 'Book kept on the table'. The keywords and one line is played within the variety of audio. Smart vision aims to produce this missing experience for them. The system uses state of the art deep learning techniques from Microsoft Cognitive Services for image classification and tagging. The experience is powered by the python voice assistant.

Keywords: Smart Vision, Deep learning, Microsoft Cognitive Services, image classification, voice assistant, tagging.

I. INTRODUCTION

There are about 285 million visually impaired people within the world, who aren't ready to experience the globe the way normal people do. The people with complete blindness or low vision face many varieties of hurdles in performing on a daily basis routine works. Blindness can occur because of many reasons including disease, injury or other conditions that limit vision.

Our aim is to develop a navigation aid for the blind and therefore the visually impaired people. This project aims to assist the blind in object detection with the gap of the article and to produce an audio information about the item detected. The system helps the blind to navigate using real time object detection and identification.

The smart vision captures the frame of the encircling and sends it to the microsoft cognitive services for image identification and generates keywords which is stored within the dynamo database. The python voice assistant plays the keywords within the sort of audio.

II. OBJECTIVES

So the objectives described during this paper are:

1.Smart vision aims to assist the blind in object detection with the space of the article and to produce an audio information about the article detected.

2.This system helps the blind to navigate using real time object detection and identification.

3.This system provides keywords for the image identified for simple understanding.

4.Python is employed for the voice assistant.

III. EXISTING SYSTEM

1. This system presents a study on Computer Vision which allows blind people to experience the beautiful world as a narrative.
2. The narrative is generated by converting the scenes in front of them to text which describes the important objects in the scene.
3. The system uses state of the art deep learning techniques.
4. Microsoft Cognitive Services is used for image classification and tagging.
5. The existing system helps the blind to navigate independently using real time object detection and identification.
6. The experience is powered by the voice assistant.

IV. PROPOSED SYSTEM

1. In this proposed system, the blind person has to ask for the description of the scene in front of him.
2. Speech recognition module is used for speech recognition. So when the user speaks or asks for the description, the speech is sent for recognition.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 7.39 ⁜ Vol. 11, Issue 4, April 2022

DOI: 10.17148/IJARCCE.2022.11413

3. Once speech is recognized a webcam is automatically opened through a python code for capturing the frame in front of him.
4. The image is captured and sent to the microsoft cognitive services for recognition and image identification.
5. The microsoft cognitive services recognizes the image and generates keywords and a description of the scene captured in the image.
6. The Amazon dynamo database stores the keywords and the description generated from the microsoft cognitive services.

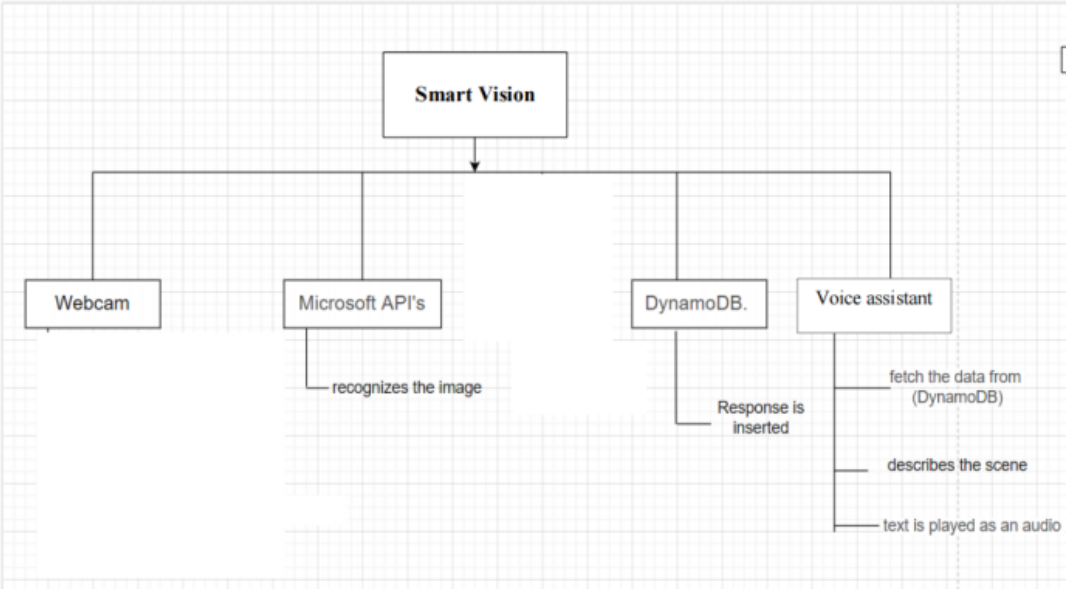

Fig 1: Working of Smart Vision

7. This system is developed in two languages English and Hindi. Hence, it has become easy for the people to use any understandable language of their choice.
8. Englishtohindi module is used to translate the keywords to hindi.
9. The python voice assistant will convert the keywords into audio in the selected language.
10. The blind person will be able to hear the audio and experience its surroundings and the world outside which he/she cannot see with their eyes.

V. IMPLEMENTATION DETAILS

The humans with entire blindness or low imaginative and prescient face many types of hurdles in acting each day habitual works. Blindness can arise due to many motives which include disease, harm or different situations that restriction imaginative and prescient. Our goal is to increase a navigation resource for the blind and consequently the visually impaired humans.

Table 1: Hardware and Software setup requirements

Sr. No	Device	Description
1	P-Vision	Used by the user and hosts the camera
2	Camera	The Creative live HD Webcam was used
3	Microsoft Cognitive Services	Deployed for image recognition
4	Voice assistant	To play the audio

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 7.39 ⁜ Vol. 11, Issue 4, April 2022

DOI: 10.17148/IJARCCE.2022.11413

This project aims to help the blind in object detection with the distance of the object and to provide an audio information about the object detected. The device facilitates the ignorant of navigate independently the usage of actual time item detection and identification
Figure 1 shows the components and softwares required in the working of the smart vision along with their usage.

Table 1 shows how the hardware and the software are setup for the project and have also mentioned for what purpose those hardware and software are used in the project.

VI. RESULTS

Example 1: For English(Crowd of people)

As the python software is run it first greets the master/consumer via way of means of saying “Good evening [Master Name] then asks the master to settle on the language via way of means of saying “Choose the language Hindi or English” and consequently the users must select the language as proven in fig2

Fig 2 : Step 1

After choosing the language an audio is played which says “This world is a beautiful place and I am here to help you see it with my voice.If you want to know whats happening around say describe the scene”
Then the user has to say describe the scene as shown in fig 3.

Fig 3: Describe

As soon as the users asks to describe the scene the webcam is switched on and captures the image frame in front of the user as shown in fig 4.

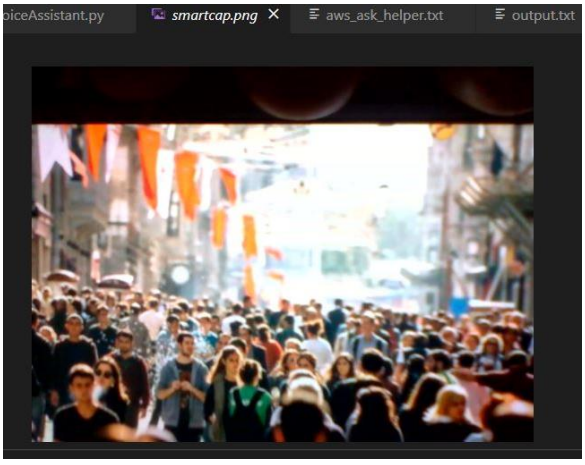

Fig 4: Image Captured 1

After the image is captured it is sent for recognition to microsoft vision API which then identifies the image and generates some keywords, tags and description along with the accuracy rate as shown in fig 5.

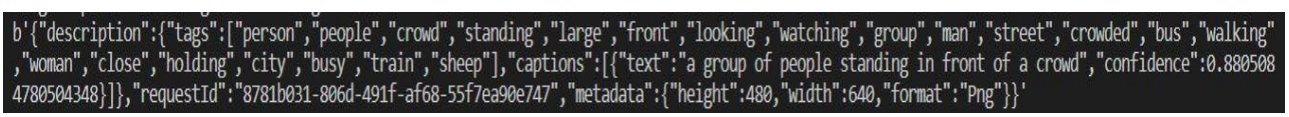

Fig 5: tags

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 7.39 ⁜ Vol. 11, Issue 4, April 2022

DOI: 10.17148/IJARCCE.2022.11413

After identification of the image the description generated is stored in the dynamo database as shown in the fig 6.

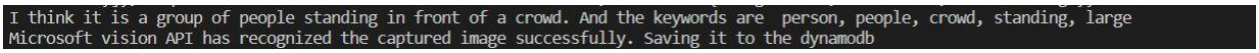

Fig 6: Dynamo db

From the dynamo db the description is fetched for converting the text into audio in the language selected.In this example the language selected is English.So the audio of the converted text is played in English using the gtts module (google text to speech).

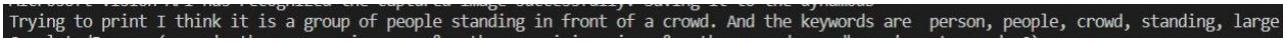

Fig 7:Audio

Example 2: For Hindi (Children playing)

For hindi language, the user has to choose the language “Hindi”. Then an audio is played which says in hindi “ ye duniya wakaiye me bohot khubsurat hai aur aap bhi meri madat se iski khubsurti ka anubhav kar sakte hai.Agar aap janna chahte hai apke aas paas kya ho raha hai toh haa bole ”.Then the user has to say “ haa ” as shown in fig 8.

Fig 8: Hindi

A webcam opens for capturing the frame in front of the user.And the image is captured as shown in fig 9.

Fig 9 : Image Captured 2

The description is saved within the dynamo db in English. By the usage of the English to hindi module the english textual content is translated into hindi and is given as an audio. Figure 10 indicates how the textual content is saved and translated to hindi.

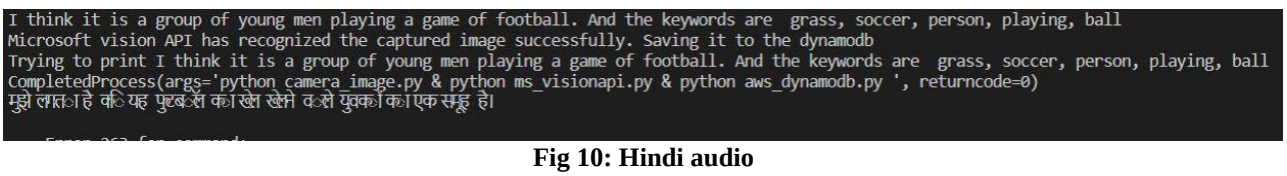

Fig 10: Hindi audio

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 7.39 ⁜ Vol. 11, Issue 4, April 2022

DOI: 10.17148/IJARCCE.2022.11413

Example 3: For traffic on road

Fig 11

Fig 12

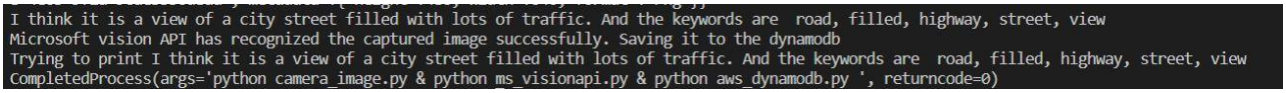

Fig 13

VII. CONCLUSION

Various research studies have investigated the challenges that disabled people, especially those with visual impairment face during and after disasters. Unfortunately, this group of individuals are constantly being excluded from disaster management plans in different countries, and no specific supporting devices or services are provided for them during and after disaster situations. These people have been identified as a vulnerable group who may be affected dramatically by disasters.

Besides their loss of vision, their challenges also extend to mobility and communication difficulty in disaster scenarios. To address this challenge, this research study has proposed the Smart Vision solution that can be utilised by the visually impaired for normal activities, and especially during disaster situations. This Smart Vision device provides a real-time navigation and narrative system. The device is cost effective (about NZD 200), which makes it affordable and accessible for the wider community who suffer from this problem.

We hope that this proposed Smart Vision can be a step to providing the visually impaired people with the missing support and services they so desperately need during and after disaster situations. This research work is only a proof-of-work; in our future work, we hope to make a complete standalone version with additional assistive functionalities for the blind.

VIII. ACKNOWLEDGMENT

The authors would like to thank **Dr. S.M.Patil** and **Prof. S.N.Mhatre** for helping to get through all the difficulties regarding the paper and the implementation.

International Journal of Advanced Research in Computer and Communication Engineering
Impact Factor 7.39 ⁜ Vol. 11, Issue 4, April 2022
DOI: 10.17148/IJARCCE.2022.11413

IX. REFERENCES

[1] Smart Vision for Visually Impaired in Disaster Situations. November 2018
[2] Facial Recognition Smart Glasses for Visually Challenged Persons. IJESC, September 2020
[3] Smart Guiding Glasses for Visually Impaired People in Indoor Environment. Jinqiang Bai, Shiguo Lian, Member, IEEE, Zhaoxiang Liu, Kai Wang, Dijun Liu, August 2017
[4] A Unique Smart Eye Glass for Visually Impaired People. November 2018
[5] Smart Glasses for the Visually Impaired People. Esra Ali Hassan and Tong Boon Tang July 2016
[6] A Navigation Tool for Blind People. April 2007
[7] Wearable Smart System for Visually Impaired People. March 2018
[8] Smart Glasses for Blind people. Spring 2018
[9] Smart Helmet for Visually Impaired. April 2019
[10] Design and Development of Smart Belt for Blind. June 2020
[11] Ultrasonic Sensor based Smart Vision as Electronic Travel Aid for Blind People. October 2020
[12] Smart Vision – Wearable Visual Guidance System for blind. 5 May,2020
[13] A Survey on Indoor Navigation for Blind People. 12 Dec, 2019
[14] Navigation Systems for the Blind and Visually Impaired: Past Work,Challenge and Open Problems. August 2019
[15] Proposed System on Object Detection for Visually Impaired. April 2018

