IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

VISUAL AID FOR BLIND PEOPLE USING RASPBERRY PI AND CAMERA

[1]Dr. P. Padmaja, [2]P. Ujwala, [3]V. Pranathi, [4]B.Hruthik

[1]Professor, [2]student, [3]student, [4]student

1ELECTRONICS AND COMMUNICATION DEPARTMENT,

1TEEGALA KRISHNA REDDY ENGINEERING COLLEGE, HYDERABAD, INDIA

Abstract: According to statistics from the World Health Organization (WHO), at least 285 million people are visually impaired or blindness. Blind people generally have to rely on white canes, guide dogs, screen-reading software, magnifiers, and glasses for navigation and surrounding object detection. Therefore, to help blind people, the visual world has to be transformed into the audio world with the potential to inform them about objects. In this paper, we propose a real-time object detection system to help visually impaired people in their daily life. This system consists of a Raspberry Pi in which YOLO (You Only Look Once) deep learning algorithm is employed. We will use YOLOv3 real-time Object Detection algorithm trained on the COCO dataset to identify the object present before the person. Then the label of the object is identified and then converted into audio by using Google Text to Speech (gTTS), which will be the expected output.

I. INTRODUCTION

According to the study conducted worldwide by the World Health Organization (WHO), about 285 million people suffer visually impaired, of whom 39 million were blind, 246 million had low vision. The number of visually impaired people is exploding with the growth of the newborn population, eye diseases, accidents, aging, and so on, and every year, this number grows by up to 2 million worldwide [1][2]. The abilities of the visually impaired for performing daily tasks are limited or influenced. For that reason, many visually impaired people will bring a sighted friend or family member to help navigate unknown environments. These social challenges limit a blind person's ability to meet people [3]. Previous research has suggested many strategies to overcome the issues of visually impaired people (VIPs) to live normally. These strategies have not been able to fully address the safety measures when VIPs walk on their own and the proposed ideas are generally high in complexity, and not costeffective etc.[4]. We suggest a system based on image processing and machine learning breakthroughs. The system comprises a Raspberry Pi in which the YOLO (You Only Look Once) deep learning algorithm is employed, whereby the device includes a camera module and an audio jack. The camera will capture the object's image that is in front of the person. Thereafter, it gets processed using deep learning methods and, in turn, the output, which is the name of the object, will be converted into audio for the user through the audio jack. A system is proposed aids visually impaired people in dealing with day-to-day activities like walking, working, and doing house chores.

FLOW CHART

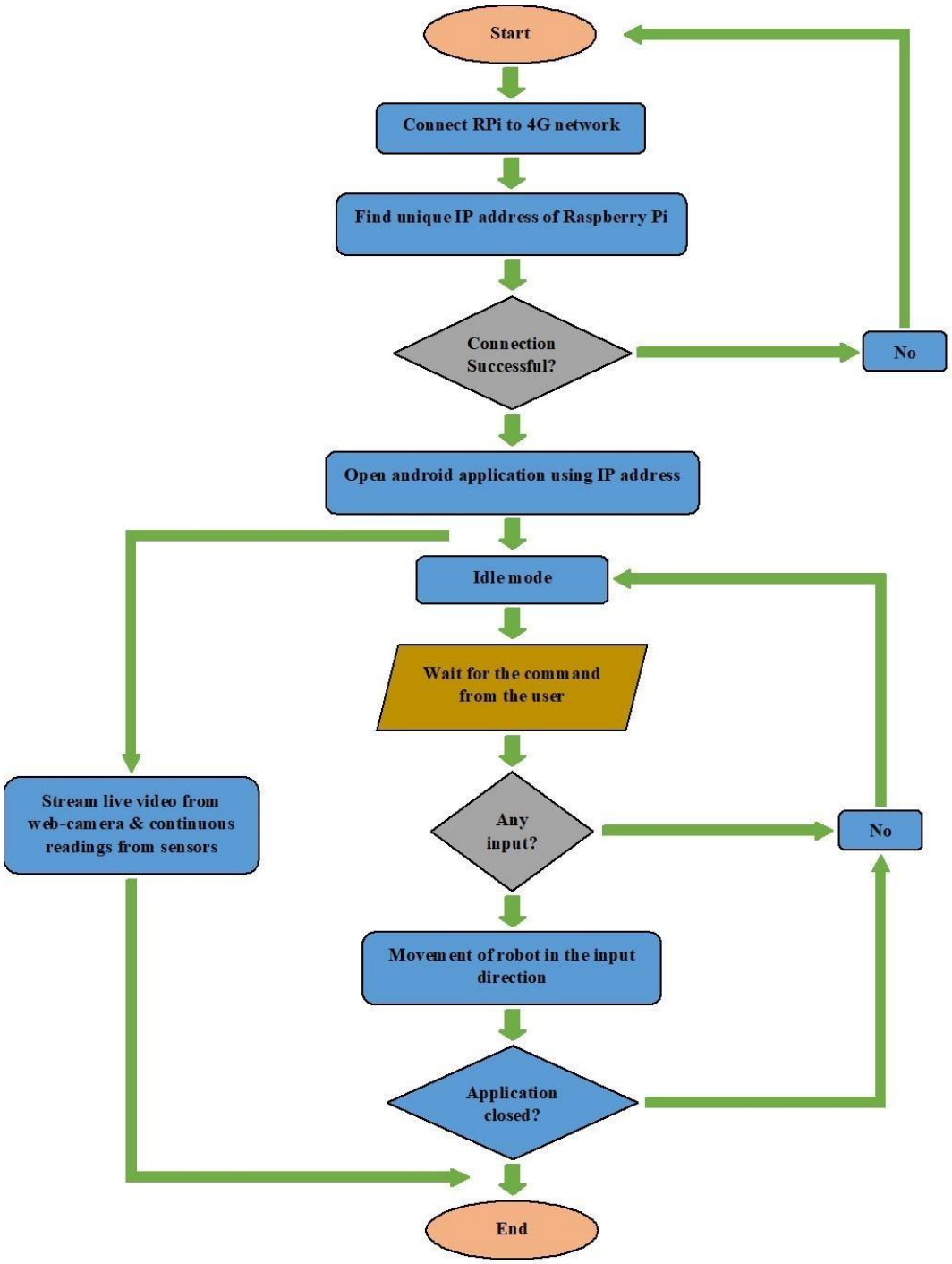

Fig no: flow chart

It's a diagram that illustrates the workflow required to complete a task or a set of tasks with the help of symbols, lines and shapes. Below are two examples of a flowchart.

WORKING PRINCIPLE

GPS plays a prominent role in the present day navigation systems, starting out with smartphones and automobiles to much complex missile guidance systems. Yes!! the GPS is indispensable. That was, just to remind ourselves the importance of GPS and to understand how painstaking the navigation, without GPS, will be; plotting a course, getting lost, and finally finding the way.

Actual topic here, as the title says, is communication between the Pi and a GPS module and there by reading the latitude and longitude. This quick learning guide will be helpful to add position tracking to your Pi project. So lets start on the topic here.

Raspberry Pi, interfaced with a GPS module, can be used for developing an advanced real-time navigation system. Incorporating the Pi's image processing, audio processing and web interface capabilities along with the GPS data we can develop advanced navigation schemes for real-time implementation.

Initially, input is taken from the infrared sensors, whenever an obstacle is detected. Furthur this input is in the form of an analog signal which is fed to the microcontroller. Based on the input analog signal microcontroller will analyze the obstacle and sends output to the voice playback module where the user can hear in which direction and at what distance the obstacle is located.

Whenever someone wants to trace or locate the blind person then he can use the base apk to find out the exact location of the blind person.

RESULT

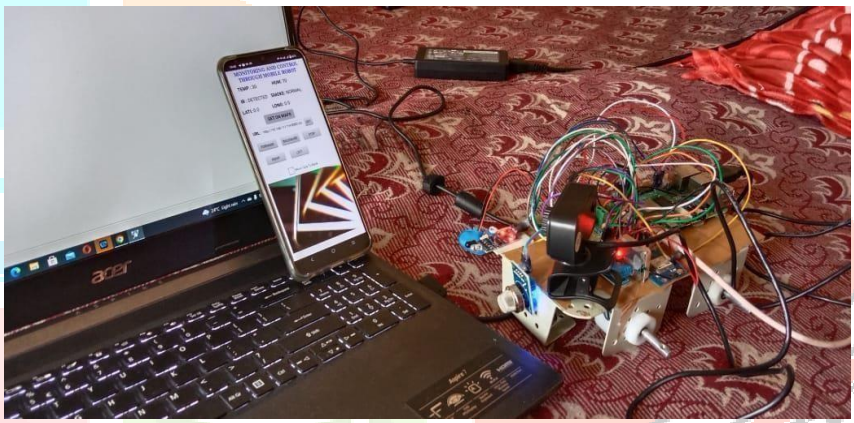

Fig 6.1 Output Of The project

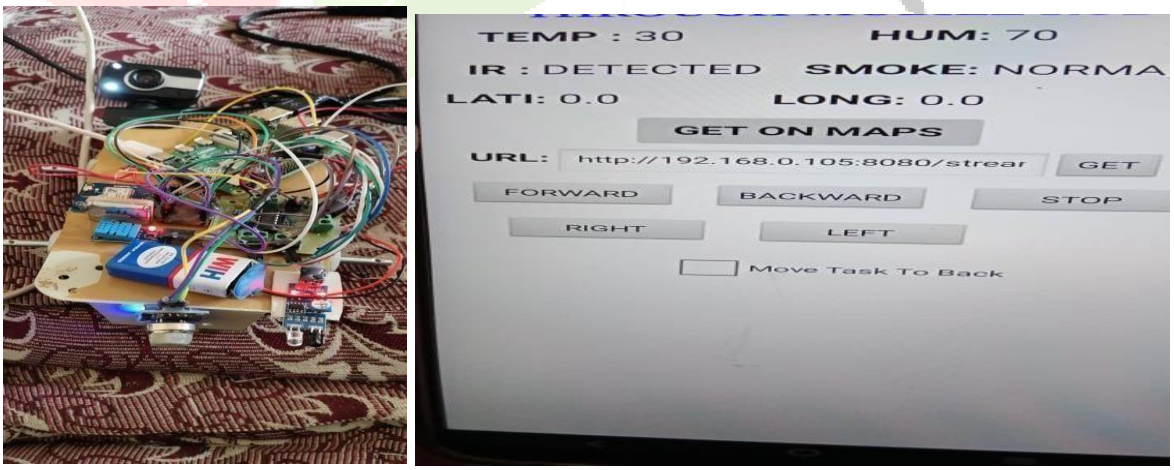

Fig 6.2 Output Of stage 2

Fig 6.3 Output of Stage 2

Object detection is a field of computer vision that detects instances of objects in images/videos which can then be converted to annotated text into voice responses. We propose a smart solution based on a camera connected to a Raspberry Pi embedded board which captures the videos of the obstacles.

GPS plays a prominent role in the present day navigation systems, starting out with smartphones and automobiles to much complex missile guidance systems. Yes!! the GPS is indispensable. That was, just to remind ourselves the importance of GPS and to understand how painstaking the navigation, without GPS, will be; plotting a course, getting lost, and finally finding the way.

CONCLUSION AND FUTURE SCOPE

The smart walking kit, constructed with at most accuracy, will help the blind people to move from one place to another without others help. This could also be considered a crude way of giving the blind a sense of vision. This skit reduces the dependency of visually impaired people on other family members, friends and guide dogs while walking around. The proposed combination of various working units makes a real-time system that monitors position of the user and provides dual feedback making navigation more safe and secure. The smart kit detects objects or obstacles in front of users and feeds warning back, in the form of voice messages and vibration. The advantage of the system lies in the fact that it can prove to be a low-cost solution to millions of blind people worldwide .And it is used to locate blind person by their parents or third person in google maps with an apk.

The global position of the user is obtained using the “Global Positioning System” (GPS), and their current position and guidance their destination will be given to the user by voice. This not only helps the user but also gives the information about the current status of the user to their family members. Now Google is creating AI-powered glasses that can help the blind and visually-impaired people. The glasses, developed by Envision, can get visual details from images of the people and public transport, among other things and speak to the user. It can also read texts from books, identify.

ACKNOWLEDGEMENT

First, We would like to thank our Project guide Dr . P. Padmaja, Professor in Department of E.C.E., for her inspiration, adroit guidance and constructive criticism for completion of my degree.

We would like to convey our special thanks to the Project Co-Ordinator Mrs.P.Sharmila Rani, Associate Professor in Department of E.C.E., for her valuable guidance and suggestions in analyzing and testing throughout the period, till the end of this work completion.

Also, we would like to express our sincere gratitude to Dr. SK. Umar Faruq. Professor Head of Department in Electronics & Communication Engineering during the progress of the Project work, for his timely suggestions and help in spite of his busy schedule.

We would like to convey our special gratitude to the Vice-Principal Dr. KMV.MADAN KUMAR, Professor in Department of C.S.E., for his inspiration, adroit guidance and constructive criticism for completion of this work

Our acknowledgement extended to Principal Dr. K.V. Murali Mohan, Principal of TEEGALA KRISHNA REDDY ENGINEERING COLLEGE for his consistent help and encouragement to complete the research work.
We are very much thankful to TKR EDUCATIONAL SOCIETY on behalf of my beloved Chairman Sri TEEGALA KRISHNA REDDY Garu for their help in providing good facilities in our college.

REFERENCES

[1] Ayat A. Nada Department of Computers and Systems Electronics Research Institute, Giza, Egypt
[2] Arnesh Sen Kaustav Sen Jayoti Das Jadavpur University: Dept. of Physics, "Ultrasonic Blind Stick For Completely Blind People To Avoid Any Kind Of Obstacles", Kolkata,India senarnesh.elec@gmail.com.
[3] "An Application of Infrared Sensors for Electronic White Stick" S. Innet N. Ritnoom 1Department of Computer and Multimedia Engineering ,Department of Electrical Engineering University of the Thai Chamber of Commerce .
[4] "Smart Assistance Navigational System for Visually Impaired Individuals " Mrs. S. Divya, Assistant Professor, Department of Electrical and Electronics Engineering, Kalasalingam Academy of Research and Education, Virudhunagar