

Direction Mapping for Dim-Sighted People

Anshul Agrawal, Vaibhav Dwivedi and R. Brindha

Abstract--- *The smart walking stick helps blind people to perform navigation and to Complete their work easily and in a comfort way. In normal stick, the detection and recognition of the obstacle is not done and normal stick is not efficient for dim sighted people. Because the blind person is unaware of what type of things or what type of the obstacles come in front of them. The person cannot recognize what is the size of that object and how far is he/she from the object. It is difficult for blind person to move here and there. In smart walking stick, the object is detected with the help of a camera and also it measures the distance between objects by using ultrasonic sensor. If any obstacle or person comes in front of blind person, he/she can know about that by hearing the sound generated by the ear phones. In this GPS module will also be attached which will enable a person to reach nearby destination with a shorter path. We will try to implement this using Raspberry Pi and using different algorithm that are NEO-6M(NMEA) and OPENCV for better output precision.*

Keywords--- *Raspberry Pi, Ultrasonic Sensor, GPS Module, Walking Stick.*

I. INTRODUCTION

Dim-sighted persons have difficulty to interact with environment and physical movement is a difficult for dim-sighted person, to identify and recognize obstacles coming in front of them, and they are not able to move in order to get safe. They depend on others .previously, different designs with limitations had been proposed. Finally smart stick method is came to existence to assist and alert dim- sighted persons from obstacles and give Information about their location. Smart stick aid is specially developed to detect obstacles which helps the dim sighted people to navigate without any problem. The audio module alerts and considerably reduce accidents. The proposed System contains the ultrasonic sensor, audio module, raspberry pi, and speaker.

The proposed system detects and identify the obstacle images with the help of a camera. The stick measures the distance between the objects and smart stick by using an ultrasonic sensor. When any objects or obstacles come in front of ultrasonic sensor then audio module tell about the obstacle which is in front of the stick. The smart walking stick is a simple .this device is light in weight and portable.

The main serving purpose of the system is to provide an efficient navigation aid for the blind persons.

II. LITERATURE SURVEY

Nowadays, the human assisting technology are evolving which are main application of artificial intelligence and digital image processing. Like wise lots of assisting devices are designed for Dim-Sighted people. In [1] the smart stick is developed which tells about the location of the blind people and also indicates him with buzzer if any obstacle comes in his path and many sensors are also used such as IR sensor, water sensor and ultrasonic sensor are

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the obstacle detection in the path. The main task of water sensor is to sense and detect the water in the road and IR sensor detects the pits in the path. Power supply unit is used to supply the power to micro controller and micro controller is used to send and receive signals from all the sensors.

In [2] an innovative stick is designed for blind and visually impaired people in this stick micro controller, sensors, audio playback module is used for assisting and guiding visually impaired people. The main use of audio playback module is to tell about the obstacle to the person so that he can be alert in the situation and his safety is insured. The micro controller which is used in the stick is Audion uno whose performance is quite good when it comes to transferring and receiving any signal form various types of sensors. Basically this project will guide the blind people to go anywhere without any danger.

In [3] the innovative and intelligent stick is designed for dim-sighted people which will assist and guide them while they are walking anywhere it will very much efficient in navigating the blind people. This stick will first detect the obstacle by ultrasonic sensor by using ultrasonic waves once the sensing of obstacle is done then the data is send to the micro controller and then the micro controller Will receives the data and process the data and check weather the object is close enough to alert that blind person or not. The wireless RF remote is also used in the stick if the blind person forgets that where he kept his stick last time then he can use the rf remote to locate his stick if he clicks the RF remote button the buzzer will create the sound and he can be able to locate his stick.

In [4] the creative sick is designed for assisting the blind person basically in this stick the sensors are used for the detection of the obstacle and the audio recorder is used to record the command if the distance is less than 100m the command which is recorded is that be careful the distance is less than 100 meter like wise for other distances also. When the command is successfully recorded by the recorder the it s processed by the micro controller and it is played in the speaker so that the blind person can hear the voice in the speaker and be alert to take the action. In short this stick will give the proper warning to that blind person about the obstacle which comes in between his path.

In [5] the smart stick is designed for visually impaired people which will guide and assist the blind person and also navigates him while he walks in the road or any where like all the previous papers the sensors are used for the detection of the obstacle and the micro controller is used for processing the commands and the signals of the sensors and in this stick the fire alarm is also used if the person is in danger or is there any fire nearby the stick will give the alert to that person and also buzzer is used in the stick which will give the alert to the person about the obstacle.

In [6] This system provides a concept to provide a smart aid for dim sighted people. The system is intended to provide measures for artificial vision and object detection, real time assistance via global positioning system. The Purpose of the overall system is to provide a low cost and efficient navigation aid for dim sighted people which gives a sense of artificial vision by providing info about the environmental scenario of obstacle around them. In this system embedded system plays a major part of role. In this system we are using the Ultrasonic sensor, temperature sensor, humidity sensor, GPS receiver, micro controller, Vi- brator, Voice synthesizer, speaker or Earphone ,and Battery.

In[7]The proposed device works in both night and day light and it is very reliable and at most efficiency. The proposed walking stick for the blind may be useful for control and monitoring using ad-hoc network where rigorous

safety is required. This will help the dim sighted persons during the walk and provides an alarm if any Obstacle is detected within the set range from the person to it.

In[8] It uses a micro controller to detect an obstacles in front, left, right side of a person. It is based on ultrasonic sensors for distance measurement property. For obstacle indication, there is voice playback which helps to mention a direction of obstacles around a visually challenged person by sensors. Along with this a receiver and buzzer placed on a stick .If the person missing a stick which can be find out by buzzer sound .This sound is induced when switch on a remote controller by visually challenged people .GPS also include in stick to find a visually challenged people.

III. EXISTING SYSTEM

In present system generally different types of sensors are used for detection of obstacle. Some of the sensors are- IR sensor, ultrasonic sensor, water detection sensor, buzzer.

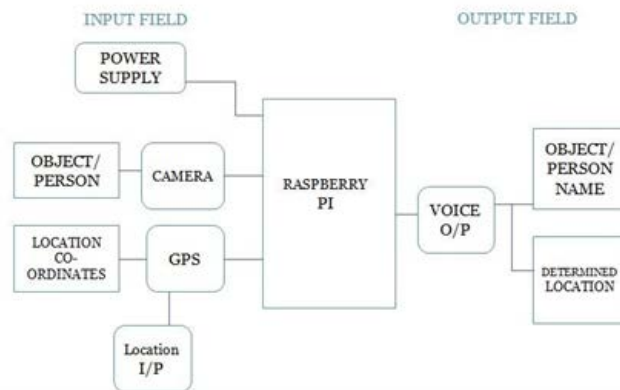


Fig. 1: Proposed Architecture

These sensors helps user by detecting obstacle in path. Water sensor is used to detect water so that user may not slip off in water. Buzzer is used for intimating danger to user.

Drawbacks:- speed and performance is not up to the requirement and efficiency and accuracy lacks

IV. PROPOSED SYSTEM

In the proposed system object detection and identification is introduced. Object identification is done by using raspberry pi which is powered by OpenCV and MEMA6 algorithm.

Detects Multiple number of objects and even localize them. Day to day objects can also be recognized and detected. We will use MS COCO dataset (Common Object In Context). This dataset have 300k images of 90 most commonly found objects. Fully updated raspberry pi 2 model b will be Used in our project. Due to c/c++ Back end it runs Faster than pure Python code. Opencv is used for face detection. Audio synthesizer is used for playback audio. With these our system will help dim sight people to navigate to the nearby place with the help of GPS module implemented to reach at destination without any personal assistance In short our system tries to provide vision to visually impaired people.

V. CONCLUSION

This Paper Presents The Implementation On A Smart Stick That Help In Detecting The Objects Come In front Of People Using Various Sensors To Detect The Obstacles Ahead And Warn The Blind Person About The Obstacle Through Audio Module. We Implement GPS Module And GSM/GPRS Module, Where GPS Module Trace The Dim Sighted Person Using The Image Capturing And Checking In Database . All These Features Are Beneficial And Out- standing In Lending A Hand To Make The Dim Sighted People Become Self-Reliant While Navigating And Walking To Nearby Places.

References are important to the reader; therefore, each citation must be complete and correct. If at all possible, references should be commonly available publications.

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