Blind person assistance using minicam

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ABSTRACT

Object detection based electronic aid is most promising for visually Blind person to get information of nearby objects. With the simplicity in computer technologies we can afford to develop a system for visually Blind people.which can give audio information of surrounding objects. This paper explain object detection method to assist visually Blind people .We proposed an object detection algorithm, and an assistive system which is very useful for the their safety, Peaceful life and independent from other person all the time. Object detection module detect objects such as door, chair, stairs, mobile phone etc. and generate an audio Information to the user . Color detection module generates audio output about object color in front of the camera, it is useful in detecting clothing colors, fruits color etc. The system modules and operation can be selected using an on demand push button panel which contains two push buttons. The object detection algorithm is evaluated on on-line available dataset as well as on our dataset and compared with state of art methods.

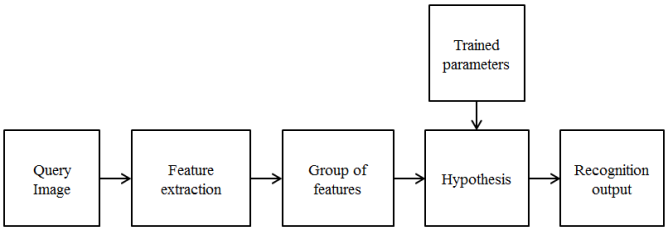
Keywords: Blind person assistance, Commuication, Data base Comparision, Webpage.

I. INTRODUCTION

The environment around us is highly complex so we need some sensors such as vision, touch, smell etc. to survive in this world. All the creatures on Earth have a set of such sensors which help them searching food, water, and safety etc. Among all these sensors vision is critically important sensor because it give accurate and complex representation of the environment which can be processed to get valuable information .The main advantages of vision sensor as compare to other are its large and wide range, ability to provide complex data which can be processed to extract information such as object Colour, shape etc. Some creatures are depicted, note that all of these are having a pair of eyes irrespective of environment (Air, Land, Water) it can be concluded from the figure that, vision is primary sensor to survive not only on land but in water and air also. Human beings are highly dependent on vision sensor for daily tasks such as walking, eating, searching food, Finding routes, driving vehicle, reading book etc. object detection is the basic algorithm in most of vision related task. Human outperform best computer vision algorithm to almost any measure and due to this main stream computer vision is always inspired from human vision, but visual neuroscience is limited. To early .We do object recognition all the time for example while you are reading this thesis you are recognizing characters and hence words, object recognition is needed in navigation, tracking, automation and so on, from above discussion we can convince our self that object recognition is highly important. But what if someone born without vision capability or in some accident one lose sight? Without eyes it Some of the creatures on Earth with eyes .is hard to survive even in his/her own environment, the person without sight has to memories everything in his environment and get irritated if someone misplace objects. Navigation and or searching objects in unfamiliar environment is surprisingly difficult for visually impaired people. In following sections we introduced object recognition, assistive technology and we cover work which have been done so far and related to our research. Motivation and problem statement is also given in this chapter. Object recognition is inherent part of our vision system to survive in this world, human and other creatures can perform this task instantly and sortlessly , but this is a hard problem for machine because each object in 3D world can cast infnite number of 2D projections due to transforms, illumination change and camera viewpoint Object recognition is an extensively studied, there are millions of articles available on object recognition, these articles can be divided into two broad categories one is shallow learning object recognition methods and other is deep learning object recognition methods.

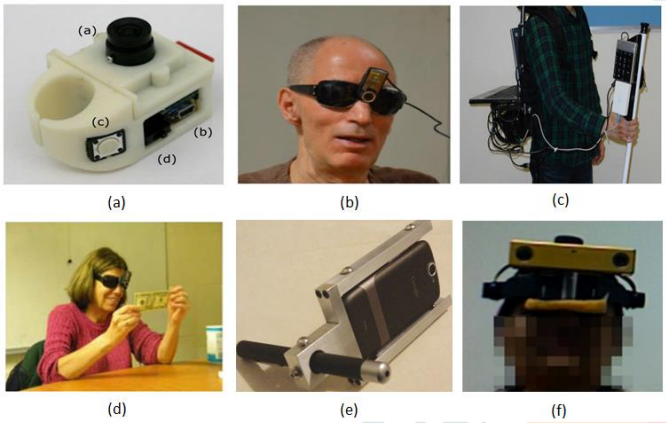
II. METHODS

- Several assistive methods(vision substitution) have been developed so far, these methods can be categories as: RFID based methods, sonar based method, image processing based method and computer vision based methods.
- Among them computer vision

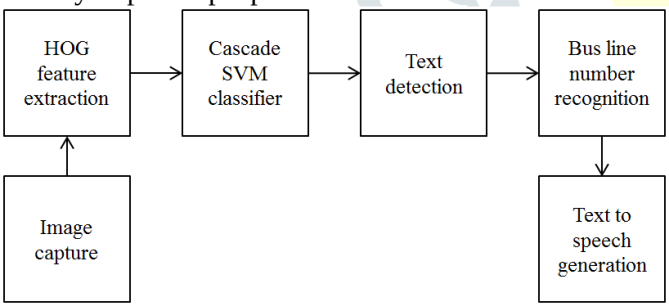


Low vision is the case when visual acuity is less than 6/18 but more than or equal to 6/60.

1) A person is considered as blind when visual acuity is less than 6/120.
2)We are all witness of technological advancement in recent years, which motivates us to develop a system for less privileged group of people.
3) Several electronic assistive system has been developed so far, but there are very few which are using computer vision, but vision based systems are gaining momentum in recent research already developed assistive systems using computer vision is portrayed, is a camera device which is developed to wear on longer and can be pointed in desired direction
4) In image and a camera mounted on glasses system is designed which works like an eye in between two eyes, so a person can rotate his head in potential object direction. In _gure and a stereo vision cane is shown which employ 3D imaging to get depth data .
5) Depicted a virtual smart cane [22] which contains a laser and a smart phone with vibration mechanism.



6)Researchers have developed assistive methods and devices to help visually impaired to provide safety and quality life. In this section the methods which incorporate computer vision technologies to assist visually impaired people are summarized.



a bus detection and recognition system is proposed, the system is able to recognize coming bus route and other text and generate speech to the visually impaired user, the bus detection is done by using HOG descriptor and cascade SVM classifier as shown in and then text detection and recognition algorithm come into picture, its output goes to text to speech generation engine. A clothing pattern recognition prototype system is developed in [18], this system is able to recognize four clothing

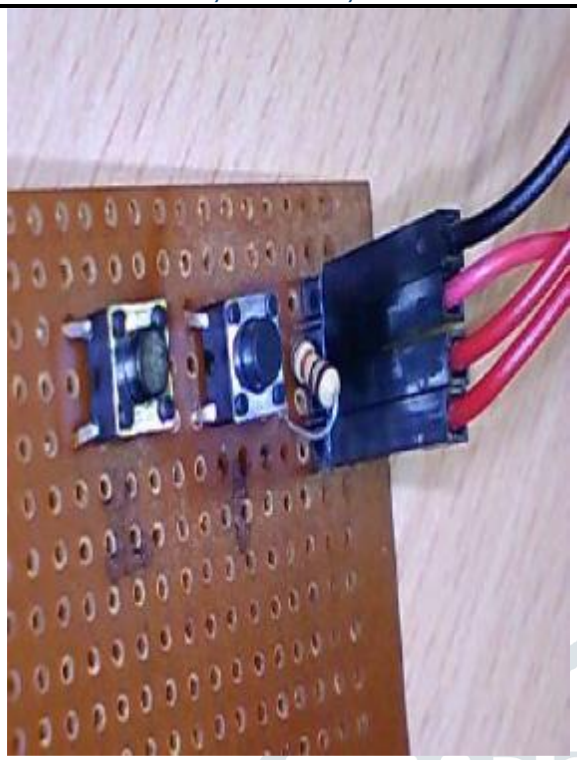
III. Architectural material

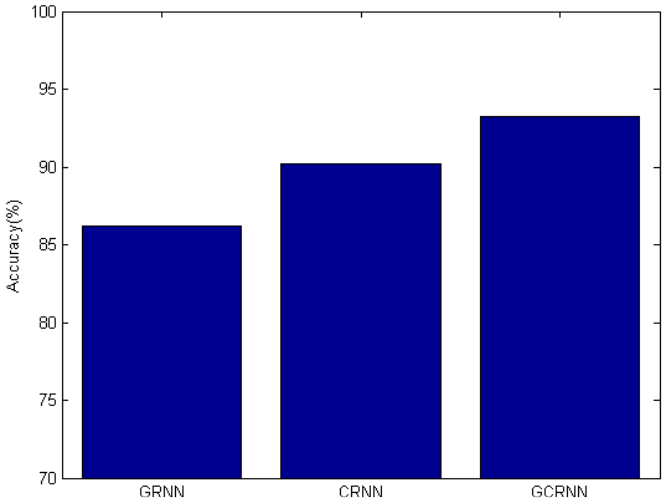
- Broadcom BCM2835 SOC.

- 512 RAM SDRAM.

- 2 USB 2.0 Ports.

- One Ethernet Port.
- 1 HDMI Connector.
- 3.5 mm audio jack.
- 26 Pin GPIO port.
- SD card support
- JTAG header.
- CSI camera connector.
- DSI Display connector.
- Micro USB connector for power.



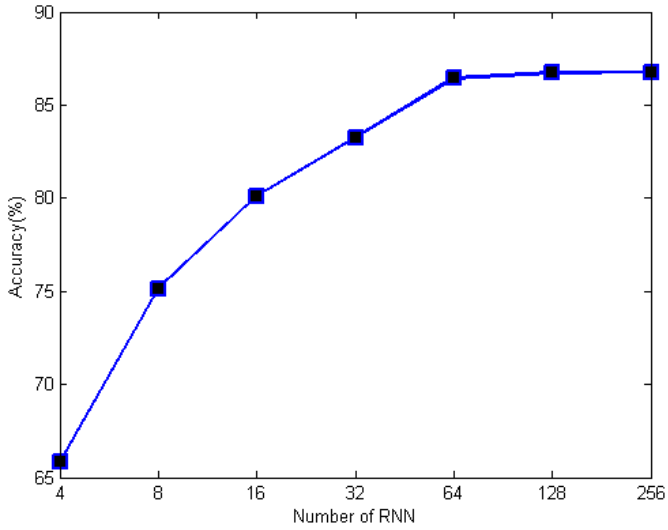


Category	CNN8	CNN16	CNN16	CNN64	CNN128	CNN
RNN4	90.90	91.21	91.52	92.49	92.03	92.18
RNN8	90.95	91.29	91.97	92.53	92.62	91.77
RNN16	91.05	92.29	93.00	93.06	92.96	92.96

IV. RESULTS AND DISCUSSION [Page Style]

The hardware implementation is done using Raspberry Pi BCM 2835 system on chip board. Pi terminal output for color and object recognition modules are depicted in Figure . From terminal output it can be noticed that our color recognition algorithm is taking around 230milisecond to proce image.The category classification (label and Softmax classi_er output) is depicted in figure , from the result it can be noticed that for category box, the probability in favor of box is 0:9998 which is apparently correct classification.

A. Figures and Tables



V. CONCLUSION

In this thesis we have proposed an assistive system for less privilege group of people in the society, which exploit object and explicit color recognition methods with on demand mode selection. GCRNN is found to be better in terms of accuracy with less number of features as compare to CRNN. Apart from simulation on MATLAB software, we have also done hardware implementation using embedded board, simulation and hardware implementations is done successfully. The processing time for color recognition module is very appropriate for this application. The GCRNN object recognition algorithm is highly parallel and hence the processing time can be improved using hardware such as FPGA, DSP, GPU etc.

VI.REFERENCES

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