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EYERIS_ A Virtual Eye to Aid the Visually Impaired

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ABSTRACT: EYERIS consists of multiple in-built options like object detection, facial recognition and communication module. For object detection, we are using Machine learning objection detection model which is trained by CNN algorithm. It can detect multiple objects at same time and detected objects name is intimated to user by tactile vibrations. For face detection, first we are collecting dataset and trained them into CNN model. Using this model we can recognize trained faces and can intimated user when only device in face identification mode. To make communication between users with other people we are using Google speech recognition and text to speech conversion. Every text appeared in the module is converted into Morse code to make corresponding tactile vibrations.

KEYWORDS: Morse code, Vibrators, Deaf-Blind people, CNN Algorithm

I. INTRODUCTION

In the era of artificial intelligence lot of object and face detection devices are available for visually impaired people. When it comes to subject of deaf-blind people there is none of devices available in market. For them, only communication devices like MyVox, Sparsha are available rather than personal assistive devices. In this project we are going to propose a personal assistive device to help deaf-blind people using Machine learning and Morse code. It consists of multiple in-built options like object detection, facial recognition and communication module. For object detection, we are using Machine learning objection detection model which is trained by CNN algorithm. It can detect multiple objects at same time and detected objects name is intimated to user by tactile vibrations. For face detection, first we are collecting dataset and trained them into CNN model. Using this model we can recognize trained faces and can intimated user when only device in face identification mode. To make communication between users with other people we are using Google speech recognition and text to speech conversion. Every text appeared in the module is converted into Morse code to make corresponding tactile vibrations.

II. LITERATURE SURVEY

[1] PROJECT TITLE : A Wearable Face Recognition System Built into a Smartwatch and the Visually Impaired User

AUTHOR NAME : Laurindo de Sousa Britto Neto^{1,2}

YEAR OF PUBLIS : 2015

ABSTRACT : Practitioners usually expect that real-time computer vision systems such as face recognition systems will require hardware components with high processing power. In this paper, we present a concept to show that it is technically possible to develop a simple real-time face recognition system in a wearable device with low processing power – in this case an assistive device for the visually impaired. Our platform of choice here is the first generation Samsung Galaxy Gear smartwatch. Running solely in the watch, without pairing to a phone or tablet, the system detects a face in the image captured by the camera, and then performs face recognition (on a limited dictionary), emitting an audio feedback that either identifies the recognized person or indicates that s/he is unknown. For the face recognition approach we use a variation of the K-NN algorithm which accomplished the task with high accuracy rates. This paper presents the proposed system and preliminary results on its evaluation.



[2] PROJECT TITLE : Application of Logistic Regression in the Study of Students' Performance Level

AUTHOR NAME : PhD. Miftar Ramosacaj1 Prof. Dr. Vjollca Hasani2

YEAR OF PUBLISH : 2015

ABSTRACT :The problem with the students' performance level in the first year of studies has been subject of many other similar studies. We have used the opportunity that binary logistic regression model offers. In this study, took part around 240 freshmen. The data were obtained from the analysis of the questionnaires. The analysis was conducted based on variables such as gender, environment where they live, type of private or public school, school location, points taken in high school, the mode of perception of the social environment. This paper deals with the presentation and analysis of the results of the examination of students' performance from University of Vlore by also establishing a more general assessment. It is assumed that students' results are affected by gender, type of private or public school, their location etc. The approach via logistic regression is done to study the results of the students after the first semester according to the variables mentioned above. The analysis consists of an examination of the impact of these independent factors in the performance of students in the first year of study.

[3] PROJECT TITLE : Face and Text Recognition for Visually Impaired Person Based OnRaspberrypi

AUTHOR NAME : Dr.R.Naveen1, S.A.Sivakumar2

YEAR OF PUBLISH : 2018

ABSTRACT :Independent travel is a well known challenge for blind or visually impaired persons and also the increasing availability of cost efficiency, high performance and portable digital imaging devices has created a tremendous opportunity for supplementing traditional scanning for document image acquisition. We propose a camera based visual assistance framework for text reading, motion of objects and the feelings of persons etc.. It converts into a voice output to help blind peoples. Thus we propose this system from a single camera-captured image as well as more number of frames and highlight some sample applications under development and feasible ideas for future development.

[4] PROJECT TITLE : Deep Residual Learning for Image Recognition

AUTHOR NAME : Kaiming He Xiangyu Zhang

YEAR OF PUBLISH : 2015

ABSTRACT :Deeper neural networks are more difficult to train. We present a residual learning framework to ease the training of networks that are substantially deeper than those used previously. We explicitly reformulate the layers as learning residual functions with reference to the layer inputs, instead of learning unreferenced functions. We provide comprehensive empirical evidence showing that these residual networks are easier to optimize, and can gain accuracy from considerably increased depth. On the ImageNet dataset we evaluate residual nets with a depth of up to 152 layers—8× deeper than VGG nets [40] but still having lower complexity. An ensemble of these residual nets achieves 3.57% error on the ImageNet test set. This result won the 1st place on the ILSVRC 2015 classification task. We also present analysis on CIFAR-10 with 100 and 1000 layers. The depth of representations is of central importance for many visual recognition tasks. Solely due to our extremely deep representations, we obtain a 28% relative improvement on the COCO object detection dataset. Deep residual nets are foundations of our submissions to ILSVRC & COCO 2015 competitions¹, where we also won the 1st places on the tasks of ImageNet detection, ImageNet localization, COCO detection, and COCO segmentation.

[5] PROJECT TITLE : Object Detection with Deep Learning: A Review

AUTHOR NAME : Zhong-Qiu Zhao, Member, IEEE, Peng Zheng

YEAR OF PUBLISH : 2019

ABSTRACT : Due to object detection's close relationship with video analysis and image understanding, it has attracted much research attention in recent years. Traditional object detection methods are built on handcrafted features and shallow trainable architectures. Their performance easily stagnates by constructing complex ensembles which combine multiple low-level image features with high-level context from object detectors and scene classifiers. With the rapid development in deep learning, more powerful tools, which are able to learn semantic, high-level, deeper features, are introduced to address the problems existing in traditional architectures. These models behave differently in network architecture, training strategy and optimization function, etc. In this paper, we provide a review on deep learning based object detection frameworks. Our review begins with a brief introduction on the history of deep learning and its representative tool, namely Convolutional Neural Network (CNN). Then we focus on typical generic object detection architectures along with some modifications and useful tricks to improve detection performance further. As distinct specific detection tasks exhibit different characteristics, we also briefly survey several specific

tasks, including salient object detection, face detection and pedestrian detection. Experimental analyses are also provided to compare various methods and draw some meaningful conclusions. Finally, several promising directions and tasks are provided to serve as guidelines for future work in both object detection and relevant neural network based learning systems.

III. PROPOSED METHODOLOGY AND DISCUSSION

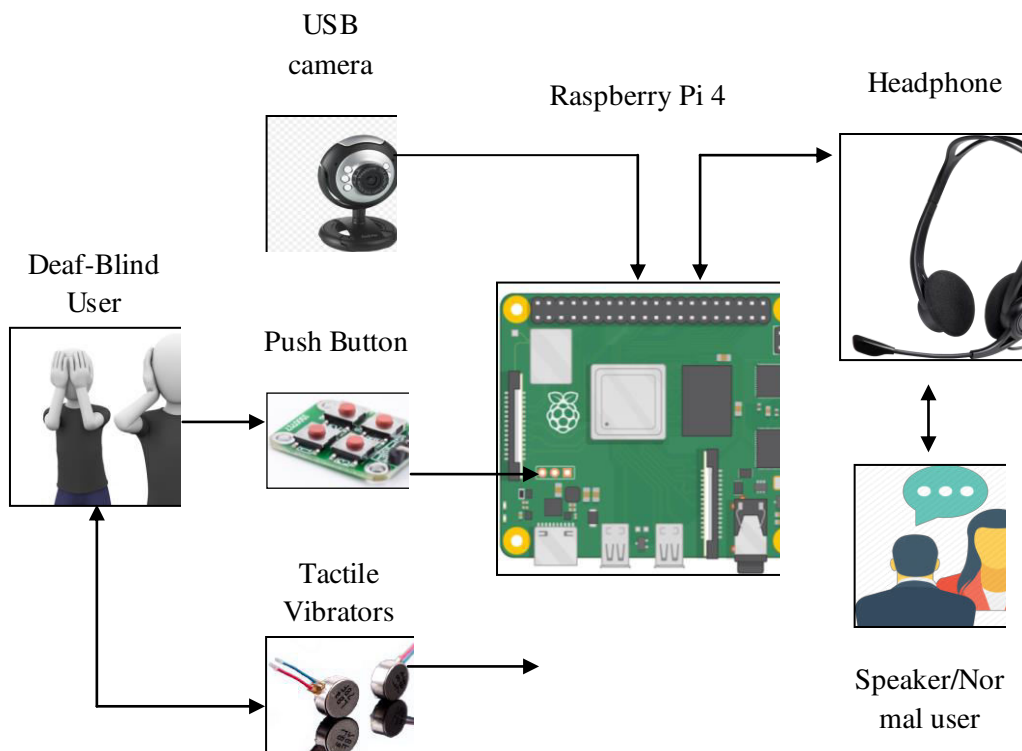
EXISTING SYSTEM

Existing system designed to assist visually impaired people by performing object detection and face recognition. It uses headphone to intimate presence of object and person by means of audio.

PROPOSED SYSTEM

Proposed system utilizes the Morse code to convert every text into vibrations using micro vibrators. Buttons are used to generate Morse code by user and converted into audio. For object detection, tflite model is used instead of conventional machine learning models. tflite model helps to increase the frame rate while using ARM based microprocessors.

BLOCK DIAGRAM



IV. CONCLUSION

We have proposed a design on face and text recognition based on raspberry pi which is mainly designed for the purpose of blind navigation. Our future work will focus on detecting the emotions of the persons and recognizing more types of indoor objects and icons on signage in addition to text for indoor wayfinding aid to assist blind people travel independently. We will also study the significant human interface issues including auditory output and spatial updating of object location, orientation, and distance. With real-time updates, blind users will be able to better use spatial memory to understand the surrounding environment, obstacles and signs.

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