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Perception Assistance for Visually Impaired Through Smart Objects

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ABSTRACT: This paper addresses the integration of a complete Text Read-out system designed for the visually challenged. The system consists of a webcam interfaced with raspberry pi which accepts a page of printed text. The OCR (Optical Character Recognition) package installed in raspberry pi scans it into a digital document which is then subjected to skew correction, segmentation, before feature extraction to perform classification. Once classified, the text is readout by a text to speech conversion unit (TTS engine) installed in raspberry pi. The output is fed to an audio amplifier before it is read out. The simulation is just an initiation of image processing i.e. the image to text conversion and text to speech conversion done by the OCR software installed in raspberry pi. The system finds interesting applications in libraries, auditoriums, offices where instructions and notices are to be read and also in the assisted filling of application forms. By using ultrasonic sensor we will measure the distance between the blind people and obstacle then the distance will be played through ear phones.

KEYWORDS: Mobile ssd algorithm, visually impaired people accesibility

I. INTRODUCTION

A novel approach for detecting and classifying 2D objects by using thegeneralized the deep learning algorithms. Our algorithm considers feature pointsand color spectra as two interleaved processes to cooperatively recognize objectsin a 2.5D fashion. With this strategy, the algorithm automates the image pre-processing operations regardless of scenes (i.e., particle cleaning, hole filling,particle eroding, and object dilating) and reduces the processing load over thesensors mobile nets for 2D object classification. Extensive experiments applied -but not limited - to recognition between different and similar objects, occlusion,and perspective change analyzing fitness and processing time show that the 2.5Dapproachmakesfeasible2Dobjectrecognitionforapplicationswithvideoinformation.

The definition of perception varies depending on sources. For Efron, it is"man's primary form of cognitive contact with the world around him", while forSchacteret al., it is "the organization,identification,and interpretation of asensation in order to form a mental representation." The progress in neurosciencehas refined the questions around perception. These questions often relate to theboundariesdefiningperception,suchastherelationshipsbetweenmotorfunctionsand perception. In that spirit, many discussions arise from the level at whichperception should be defined: some authors see it as a broad field, covering allperceptual experience, while other restrict its meaning to a well-defined field ofinformation processing.

II. RELATED WORK

The methodology of a camera based assistivedevice that can be used by people to read Text document. The framework is forimplementingimagecapturingtechniqueinanembeddedsystembasedonRaspberry Pi board. The design is motivated by preliminary studies with visuallyimpairedpeople,anditissmall-scaleandmobile,whichenablesamoremanageable operationwith little setup.Inthis project,we have proposeda textread out a system for the visually challenged. The proposed fully integrated systemhas a camera as an input device to feed the printed text document for digitizationand the scanned document is processed by a software module the OCR (opticalcharacterrecognitionengine).

Amethodologyisimplementedtotherecognitionsequenceofcharactersand the line of reading. As part of the software development, the Open CV (Opensource Computer Vision) libraries are utilized to do image capture of text, to do thecharacter recognition. Most of the access technology tools built for people withblindness and limited vision are built on the two basic building blocks of OCRsoftwareandText-to-Speech(TTS)engines.

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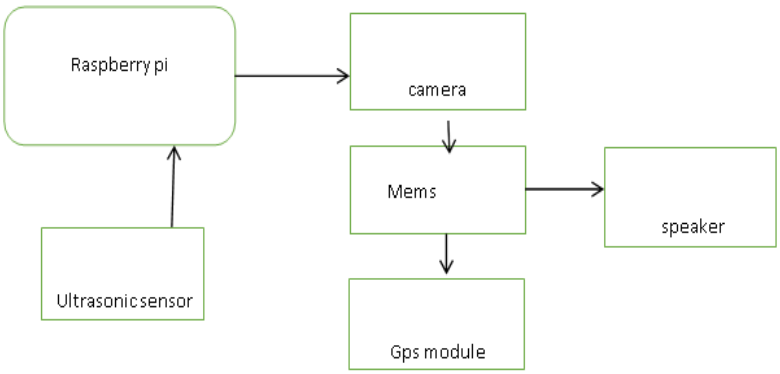
Optical character recognition (OCR) is the translation of captured images ofprintedtextintomachine-encodedtext.OCRisaprocesswhichassociatesasymbolic meaning with objects (letters, symbols an number) with the image of acharacter. It is defined as the process of converting scanned images of machineprinted intoacomputerprocessableformat.

III. ALGORITHM USED

Mobile Net SSD is an object detection algorithm that classifies the categoryof an object using the bounding box from an input image. The SSD (Single ShotDetector)model usesMobileNet to achieve fast object detection suitable formobile devices. However, it is noteworthy that the combination of an extremelyefficientbasenetworkliketheMobileNetwiththehighlyeffectiveSSDframeworkhelpinobjectdetectionorhumande tectionwithgreatspeedandaccuracy. Since computer vision models are getting more complex and deeper toaccomplish appreciable precision, the size and latency are getting increased too.Because of cases like these, Mobile Net is being used as an alternative. Mobile Netmodel is particularly designed for mobile 24 and embedded applications whichrequire high speed. When the first version of Mobile Net was popularized, Googleannounced SSD for applications that rely massively on speed and accuracy and itidentified numerous objects with a single shot of the image. Mobile Net was incorporated in to SSD forremarkable performance.

IV. PROPOSED SYSTEM



V. CONCLUSION AND RESULT

In this project, we have implemented an image to speech conversion technique using a raspberry pi. The simulation results have been successfully verified and the hardware output has been tested using different samples. Ouralgorithm successfully processes the image and reads it out clearly. This is aneconomicalaswellasanefficientdeviceforthevisuallyimpairedpeople.Wehave applied our algorithm to many images and found that it successfully does itsconversion.Thedevice is compactandhelpful tothesociety.The future of object detection technology is in the process of proving itself,and much like the original Industrial Revolution, it has the potential, at the very least, to free people from tedious jobs that willbe done more efficiently and effectively by machines.

REFERENCES

1. RayKurzweilKReaderMobileUserGuide,knfbReadingTechnologyInc.(2008).[Online].Available:http://www.knfbReading.com
2. Ms.AthiraPanicker Smart Shopping assistant label reading system with voiceoutputforblindusingraspberrypi,Ms.AnupamaPandey,Ms.VrunalPatilYTIET,University of Mumbai ISSN: 2278 – 1323 International Journal of AdvancedResearchin ComputerEngineering &Technology(IJARCET)Vol.5,Issue10,

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3. MarutTripathi,ManishKumar,VivekKumar,WarshaKandlikarANavigationSystem for blind people International journal for research in applied science andengineeringtechnology(ijraset)–Vol.2issue4,Jul-Aug2014
4. MohanrajI,SiddharthaS,"AFrameworkforTrackingSystemaidingDisabilities",2017 IEEE International Conference on Current Trends in AdvancedComputing (ICCTAC),pp1-6.
5. Mayra Samaniego, Ralph Deters, "Internet of Smart Things – IOST UsingBlockchainandCLIPStomakeThingsAutonomous",2017IEEE1stInternationalConferenceon CognitiveComputing,pp9-15.
6. Zia UshShamszaman, Muhammad Intizar Ali, "Towards a Smart SocietyThrough Semantic Virtual-Object Enabled Real-Time Management Framework intheSocialInternet ofThings",2017IEEEInternetofThingsJournal,pp1-8.
7. Osama Sohaib, Haiyan Lu, WalayatHussain, "Internet of Things (IOT) in E-commerce:ForPeoplewithDisabilities",201712thIEEEConferenceonIndustrialElectronicsandApplications.
8. AlbaAmato,AntonioCoronato,"AnIOT-AwareArchitectureforSmartHealthcareCoachingSystems",2017IEEE31stInternationalConferenceonAdvancedInformation Networking andApplications,pp1027-1033.
9. Rita Zgheib, Antonio De Nicola, Maria Luisa Villani, Emmanuel Conchon,RémiBastide, "A Flexible Architecture for Cognitive Sensing of Activities inAmbient Assisted Living", 2017 IEEE 26th International Conference on EnablingTechnologies:InfrastructureforCollaborativeEnterprises,pp284-289.
10. EmnaMezghani,ErnestoExposito,andKhalilDrira,"AModelDrivenMethodology for the Design of Autonomic and Cognitive IOT-Based Systems:ApplicationtoHealthcare",IEEETransactionsonEmergingTopicsinComputational Intelligence,Vol.1,No.3,June 2017,pp224-233.

BIOGRAPHY

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