The Ubiquitous Camcorder Based Efficient Learing for Typhlotic Person

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Abstract – We propose a camera-based assistive text reading framework to help blind persons read text labels and product packaging from hand-held objects in their daily lives. To isolate the object from cluttered backgrounds or other surrounding objects in the camera view, we first propose an efficient and effective motionbased method to define a region of interest (ROI) in the video by asking the user to shake the object. This method extracts moving object region by a mixture-of-Gaussians based background subtraction method. In the extracted ROI, text localization and recognition are conducted to acquire text information. To automatically localize the text regions from the object ROI, we propose a novel text localization algorithm by learning gradient features of stroke orientations and distributions of edge pixels in an Adaboost model. Text characters in the localized text regions are then binarized and recognized by off-the-shelf optical character recognition (OCR) software. The recognized text codes are output and users in speech.

Index Terms – Camera, Text Reading, Blind Persons, ROI, OCR.

1. INTRODUCTION

Today there are already a few systems that have some promise for portable use, but they cannot handle product labeling. For example portable bar code readers designed to help blind people identify different products in an extensive product database can enable users who are blind to access information about these products through speech and braille. But a big limitation is that it is very hard for blind users to find the position of the bar code and to correctly point the bar code reader at the bar code. Some reading-assistive systems such as pen scanners, might be employed in these and similar situations. Such systems integrate optical character recognition (OCR) software tooffer the function of scanning and recognition of text and some have integrated voice output. However, these systems are generally designed for and perform best with document images with simple backgrounds, standard fonts, a small range of font sizes, and well-organized characters rather than commercial product boxes with multiple decorative patterns. Most state-of-the-art OCR software cannot directly handle scene images with complex backgrounds.

2. RELATED WORK

To ensure the hand-held object appears in the camera view, we employ a camera with a reasonably wide angle in our prototype system (since the blind user may not aim accurately). However, this may result in some other extraneous but perhaps texted objects appearing in the camera view for example, when a user is shopping at a supermarket). To extract the hand-held object of interest from other objects in the camera view, we ask users to shake the hand-held objects containing the text they wish to identify and then employ a motion-based method to localize the objects from cluttered background. Background subtraction (BGS) is a conventional and effective approach to detect moving objects for video surveillance systems stationary.

Text recognition is performed by off-the-shelf OCR prior to output of informative words from the localized text regions. A text region labels the minimum rectangular area for the accommodation of characters inside it, so the border of the text region contacts the edge boundary of the text character. However, our experiments show that OCR generates better performance if text regions are first assigned proper margin areas and binarized to segment text characters from background.

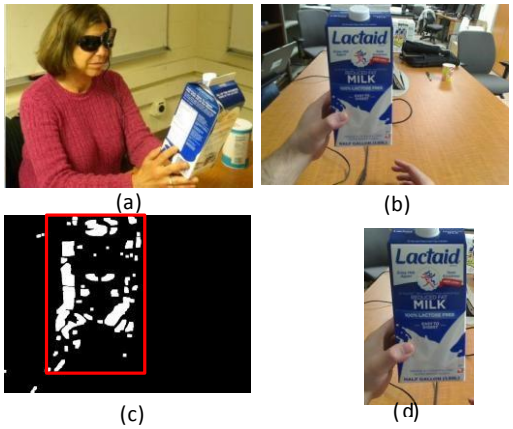
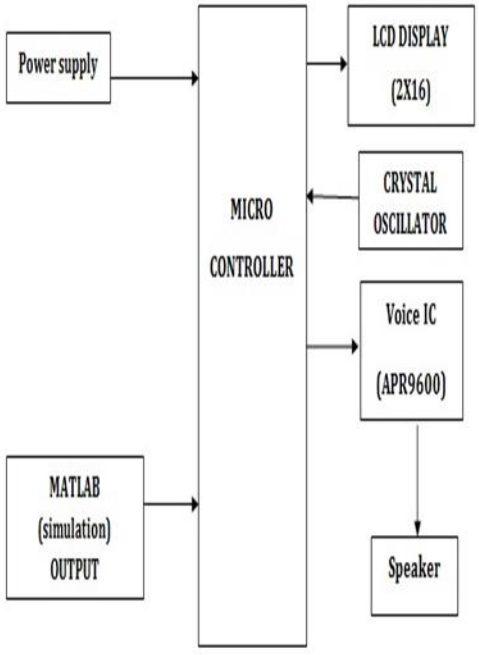


FIG1: Text and Object

3. SYSTEM ARCHITECTURE

The system architecture consists of three functional components: scene capture, data processing and audio output. The scene capture component collects scenes containing objects of interest in the form of images or videos.In our prototype,it corresponds to a camera attached to a pair of sunglasses.The data processing component is used for deploying our proposed algorithms,including.Object-of-interest detection to selectivelextract the image of the object held by the blind user from the cluttered background or neutral objects in the camera view.Text localisation to obtain imageregions containing text,and text recognition to transform image-based text information into readable codes.we use a laptop as the codes. Assistive technologies are being developed for visually impaired people in order to live confidently. This project work proposes a camera-based assistive text reading framework to help blind persons read text labels and product packaging from hand-held objects in their daily lives. The project work is framed into three stages. First, Image capturing

– Using a mini camera ,the text which the user need to read get captured as an image and have to send to the image processing Platform. Secondly, Text recognition – Using text recognition algorithm, the text will get filtered from the image. Finally, Speech output - A filtered text will be passed into this system to get an audio output. This project work can be able to insist the blind people in their daily life. The entire application will run on Raspberry Pi.



The signal input connector is often a 3.5 mm jack plug RCA connectors are sometimes used, and a USB port may supply both signal and power (requiring additional circuitry, and only suitable for use with a computer)..

An audio power amplifier (or power amp) is an electronic amplifier that strengthens low-power, inaudible electronic audio signals such as the signal from radio receiver or electric guitar pickup to a level that is strong enough for. This method can effectively distinguish the object of interest from background or other objects in the camera view. To extract text regions from complex backgrounds.

4. BLOCK DESCRIPTION

POWER SUPPLY

A power supply is an electronic device that supplies electric energy to an electrical load.The primary function of a power supply is to convert one form of electrical energy to another and,as a result,power supplies are sometimes referred to as electric power converters.some power supplies found in desktop computers and consumer electronics devices.

The signal input connector is often a 3.5 mm jack plug RCA connectors are sometimes used, and a USB port may supply both signal and power (requiring additional circuitry, and only suitable for use with a computer)..

FIG 3: Power supply

WEB CAM

A web cam is a video camera that feeds orstream its image in real time to or through acomputer to a compute rnetwork.When"captured”by computer.

FIG 4:Web Cam

AUDIO AMPLIFIER

An audio power amplifier (or power amp) is an electronic amplifier that strengthens low-power, inaudible electronic audio signals such as the signal from radio receiver or electric guitar pickup to a level that is strong enough for driving(orpowering) loudspeakers orheadphones.This includes both amplifiers used in home audio systems and instrument amplifiers like guitar amplifiers. Power amplifiers make the signal—whether it is recorded music, a live speech, singing, an electric guitar or the mixed audio of an entire band through a sound reinforcement system—audible to listeners.

It is the final electronic stage in a typical audio playback chain before the signal is sent to the loudspeakers andspeaker enclosures.

FIG 5:Audio Amplifier

SPEAKER

Computer speakers, or multimedia speakers, are speakers sold for use with computers, although usually capable of other audio uses, e.g. for an MP3 player. Most such speakers have an internal amplifier and consequently require a power source, which may be by a mains power supply often via an AC adapter, batteries, or a USB port (able to supply no more than 2.5W DC, 500mA at 5V). The signal input connector is often a 3.5 mm jack plug RCA connectors are sometimes used, and a USB port may supply both signal and power (requiring additional circuitry, and only suitable for use with a computer)..

ADVANTAGES

1. Allows the blind to know about product details.when put to real time usewould benefit blind users for complete navigation.
2. This is very easy to implement as most of the mobile phones today have the required resolution in order to scan the barcode to identify the id stored in it and read out the product description.
3. This project can be implemented in any shopping mall,supermarket etc.

5. CONCLUSIONS AND FUTURE WORK

In this paper, we have described a prototype system to read printed text on hand-held objects for assisting blind persons. In order to solve the common aiming problem for blind users, we have proposed a motion-based method to detect the object of interest while the blind user simply shakes the object for a couple of seconds. This method can effectively distinguish the object of interest from background or other objects in the camera view. To extract text regions from complex backgrounds, we have proposed a novel text localization algorithm based on models of stroke orientation and edge distributions. The corresponding feature maps estimate the global structural feature of text at every pixel. Block patterns are defined to project the proposed feature maps of an image patch into a feature vector. Adjacent character grouping is performed to calculate candidates of text patches prepared for text classification. An Adaboost learning model is employed to localize text in camera captured images. Off-the-shelf OCR is used to perform word recognition on the localized text regions and transform into audio output for blind users.

Our future work will extend our localization algorithm to process text strings with characters fewer than 3 and to design more robust block patterns for text feature extraction. We will also extend our algorithm to handle non-horizontal text strings. Furthermore, we will address the significant human interface issues associated with reading text by blind users.

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