WEARABLE CAMERA BASED HORUS AS A PORTABLE DEVICE

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Abstract: *Wearable video camera, computer, and sensing system, which enables the camera to be controlled via both conscious and preconscious events involving the wearer. Traditionally, a wearer consciously hits record on the video camera, or runs a computer script to trigger the camera according to some pre-specified frequency. The system described here offers an additional option: images are saved by the system when it detects certain events of supposed interest to the wearer. The implementation described here aims to capture events that are likely to get the user's attention and to be remembered*

There are three main categories of these systems: electronic travel aids (ETAs), electronic orientation aids (EOAs), and position locator devices (PLDs). This paper presents a comparative survey among portable/wearable obstacle detection/avoidance systems (a subcategory of ETAs) in an effort to inform the research community and users about the capabilities of these systems and about the progress in assistive technology for visually impaired people.

The survey is based on various features and performance parameters of the systems that classify them in categories, giving qualitative-quantitative measures..The development of an obstacle detection system for visually impaired people. While moving in his environment the user is alerted to close obstacles in range. The system we propose detects an obstacle surrounding the user by using a multi-sonar system and sending appropriate vibrotactile feedback. The system aims at increasing the mobility of visually impaired people by offering new sensing abilities. Finally, it offers a ranking, which will serve only as a reference point and not as a critique on these systems.

Keywords: Wearable Camera, Obstacle detection, Sentence reading, Person Identification

1. INTRODUCTION

Falls are considered to be the eighth leading cause of death in the U.S. [1] and fall injuries can result in serious complications [2], [3]. Autonomous fall detection systems can reduce the severity of falls by informing other people to deliver help and reducing the amount of time people remain on the floor. They will increase safety and independence of elderly. Yet, to find widespread use, they should be robust and reliable.

Many fall detection algorithms have been proposed relying only on accelerometer data [4], [5], [6]. Koshmak et al. [7] tested their method on actual falls of ice-skaters. Yet, since every fall has different acceleration characteristics and the magnitude of acceleration has high variation among various body types[8,9], it is challenging to detect different types of falls for different people. Cao et al. [10, 11] employ adaptive thresholds for motion sensors.

Accelerometers have also been used in the activity classification for sports activities [12, 13] to capture training statistics. As discussed in [14], since the placement of the phone differs from person to person, using just the accelerometer might not be sufficient for activity classification. In such cases ,use of camera sensors in tandem with the accelerometer can help resolving such issues. Wu et al. [15] also discuss the limitations of using just the accelerometer.

Wearable cameras alleviate, if not eliminate, privacy concerns of users since the captured images are not of the subjects but the surroundings [16]. It is also expected that wearable cameras will be employed more to understand lifestyle behaviors for health purposes [17, 18]. For the camera-based part, the proposed method employs histograms of edge orientations together with the gradient local binary patterns (GLBP), which use image features that have more descriptive power [19]. GLBPs have been used for human detection applications, and were derived from an operator named local binary pattern [20]. They do not get information through eyes.

2. EXISITNG SYSTEM

Summary of HOG and Modified HOG In the original HOG-based algorithm, proposed for human detection, an image is divided into blocks and then each block is divided into n cells. For each cell, an m-bin histogram is built, wherein each bin corresponds to a gradient orientation span. The concatenation of n histograms forms the HOG descriptor for a block, with m × n bins. For each pixel in a cell, the intensity gradient magnitude and orientations are calculated. Each gradient has a vote in its bin, which is its magnitude

The computation flow of GLBP is illustrated in Fig. 1. For each center pixel, its eight neighboring pixels are checked. A value of “1” or “0” is assigned to a neighboring pixel if its intensity value is greater or less than the center pixel, respectively. This results in an 8-bit binary number.

Moreover, the proposed method results in less false positives compared to the original HOG, showing the increase in sensitivity and specificity

2.1. Accelerometer-based Detection:

We observe the magnitude of linear acceleration with the gravity component extracted from the corresponding direction.

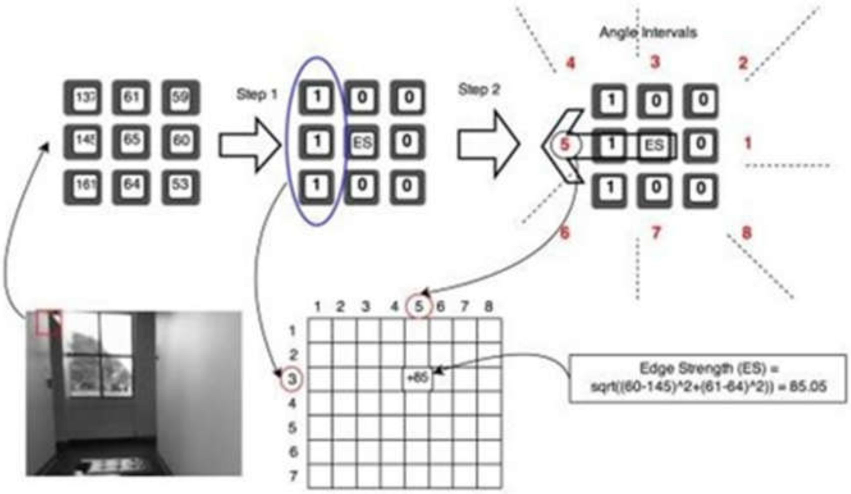

Figure 1. GLBP Histogram Generation Steps

3. PREPROCESSING

We start an image pre-processing method to separate cells which is an efficient way for

$$\boldsymbol{Circularity} = \frac{\mathbf{1}}{\mathbf{4\pi}} \times \frac{\boldsymbol{P^2}}{\boldsymbol{A}}$$

detection and classification of leukocytes this is just an example. Find the threshold that minimizes the weighted within-class variance. The weighted within-class variance: where the class probabilities are given by:

$$\boldsymbol{\sigma_{\omega}^2(t) = \ q_1(t))\sigma_1^2(t) + q_2(t))\sigma_2^2(t)}$$

iP(i) (2) nd the class means is calculated :

$$q(t) = \sum_{i=t+1}^{t} P(i) \qquad\qquad \mu(t) = \sum_{i=t+1}^{l} \frac{iP(i)}{q_2(t)}$$

3. SEGMENTATION

Region Growing can be presented as an algorithm for segmentation of intensity images which is robust, rapid, and free of tuning parameters. The method, however, requires the input of a number of seeds, either individual pixels or regions, which will control the formation of regions into which the Fig. 2. Otsu‟s segmentation where P is Perimeter and A is Area [11]. In the case of a circle, the roundness parameter is minimal and is equal to 1. In order to do a segmentation

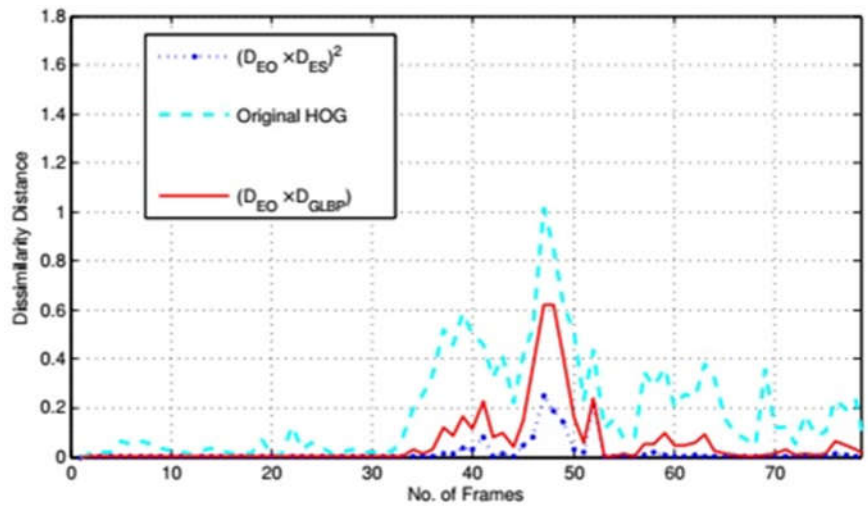

Figure 2. Plots of Different Distance Measures For Typical Fall

assessment, we compare the results obtained by our segmentation scheme with ground-truth images(obtained manually); The Table I shows the segmentation results of the two surfaces (nucleus and cytoplasm), which are the major components of our ROI. The first observation is that the nucleus region is highly satisfactory using the

OTSU method: Fig 4 (b1, b2). Region growing is shown in the next line in Fig 4 (c1, c1): with two examples, the first is oval shaped c1 and the second is circular c2. In the first iterations, we note that the region growing follows properly the shape of the cell. And when there is an overlap of the cells, the criterion of circularity prevents deformation of the cell.

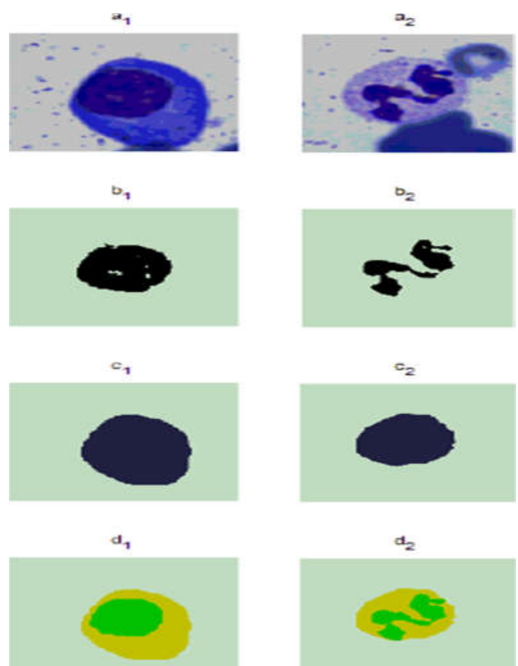

Figure 3. Segmentation of Blood Cells for comparision

4. PROPOSED SYSTEM

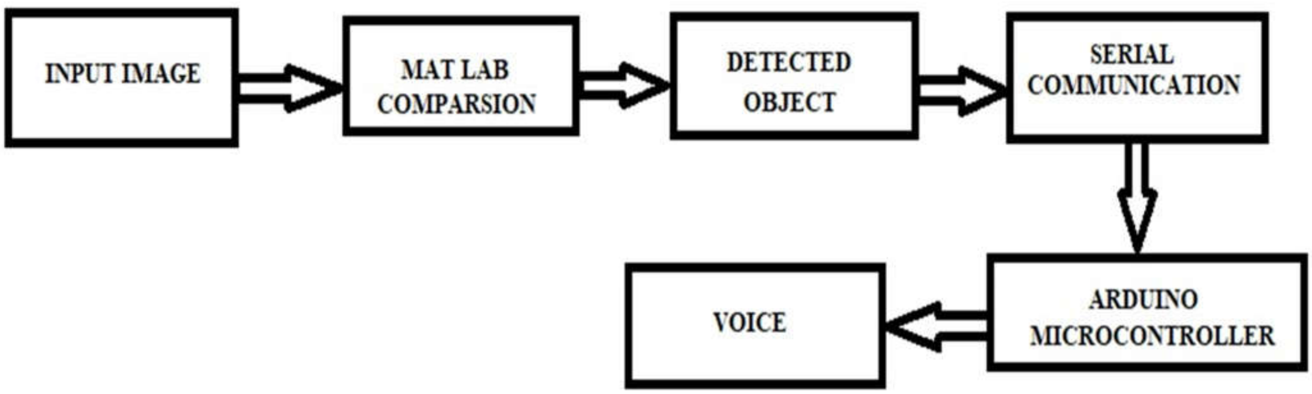

Figure 4. Block Diagram of Proposed System/ Wearable Device

5. STEPS TO FIND IMAGE IN MATLAB

5.1. Step 1: Read Images

Read the reference image containing the object of interest.

Read the target image containing a cluttered scene.

5.2. Step 2: Detect Feature Points

Detect feature points in both images.

Visualize the strongest feature points found in the reference image. Visualize the strongest feature points found in the target image.

5.3. Step 3: Extract Feature Descriptors

Extract feature descriptors at the interest points in both images.

5.4. Step 4: Find Putative Point Matches

Match the features using their descriptors. Display putatively matched features.

5.5. Step 5: Locate the Object in the Scene Using Putative Matches

Estimate Geometric Transform calculates the transformation relating the matched points, while eliminating outliers. This transformation allows us to localize the object in the scene.

- *setup()*: a function that runs once at the start of a program and that can initialize settings.

- *loop()*: a function called repeatedly until the board powers off

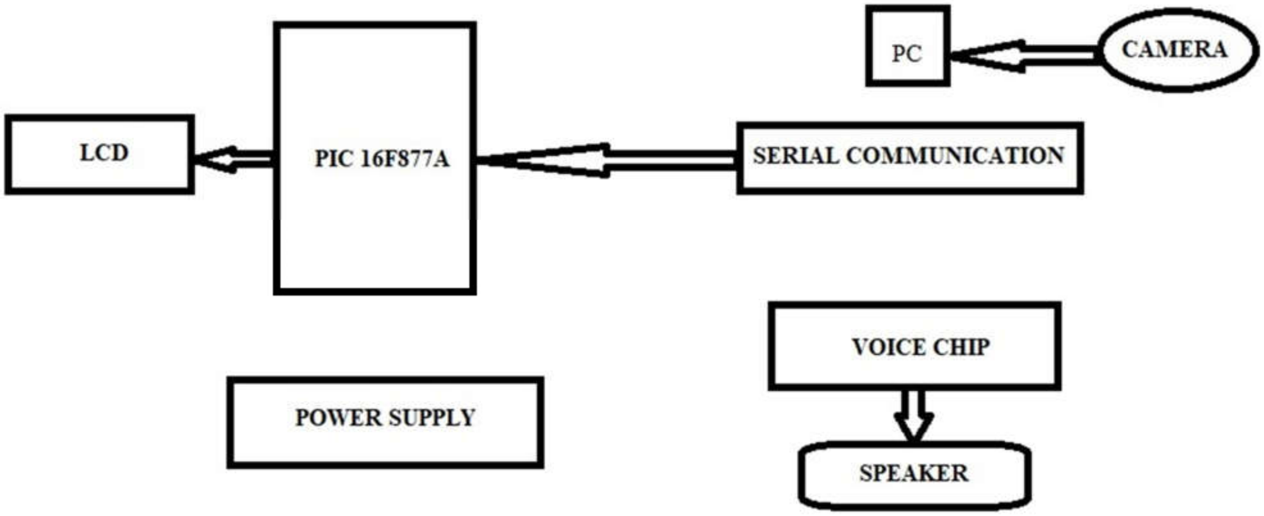

Figure 5. PC Board Block Diagram

6. MESSAGE MODE

6.1 8-Message Mode

The memory will be divided to 8 messages averagely when both MSEL0 and MSEL1 pin float after chip reset.

6.2 4-Message Mode

The memory will be divided to 4 messages averagely when MSEL0 pin connected to VSS and MSEL1 pin float after chip reset.

6.3 2-Message Mode

The memory will be divided to 2 messages averagely when MSEL1 pin connected to VSS and MSEL0 pin float after chip reset.

6.4 1-Message Mode

The memory will be for 1 message when both MSEL0 and MSEL1 pin connected to VSS after chip reset.

6.5 RECORD MESSAGE

During the /REC pin drove to VIL, chip in the record mode. When the message pin (M0, M1, M2 … M7) drove to VILin record mode, the chip will playback "beep" tone and message record starting. Connect a slide-switch between

/REC pin and VSS, and connected 8 tact-switches between M0 ~ M7 pin and VSS

7. PLAYBACK MESSAGE

Connect a slide-switch between /REC and VSS, and connected 8 tact- switches between M0 ~ M7 and VSS

8. VOICE INPUT

The aPR33A series supported single channel voice input by microphone or line-in.

9. RESET

PR33A series can enter standby mode when RSTB pin drive to low. During chip in the standby mode, the current consumption is reduced to IS Band any operation will be stopped, user also cannot execute any new operate in this mode.

10. FEATURES

- ❖ Operating Voltage Range: 3V ~ 6.5V
- ❖ Single Chip, High Quality Audio/Voice Recording & Playback Solution
  - ✓ No External ICs Required
  - ✓ Minimum External Components
- ❖ User Friendly, Easy to Use Operation
  - ✓ Programming & Development Systems Not Required
- ❖ 680 sec. (11 Minutes) Voice Recording Length in APR33A3-C2

11. RESULT AND CONCLUSION

In this we compare the objects and it under goes the process of boundary detection, pre processing, segmentation, feature extraction and as a result after the process the object is detected and converted into text and then the text is delivered as audio. This comparison is done by using inbuilt program and it is done in the MAT LAB. The object is viewed is compared and is checked using MAT LAB.

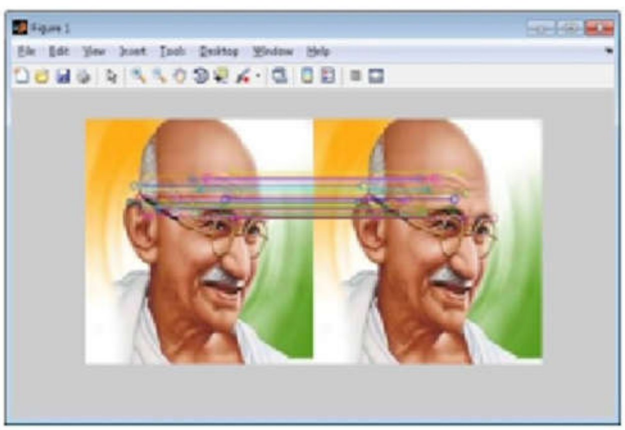

Figure 6. Comparison

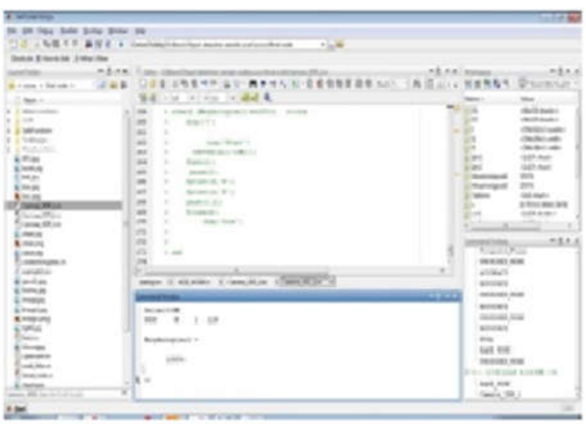

Figure 7. Program Checking

Final model which is designed for the blind people to instruct them through audio which help them in their daily life.

Figure 8. Final Output

The concept of multi-physics intelligent space for the Blind/VIP has been presented, where physical information from the geomagnetic field-effects and temperature fields are used to effectively enhance the traditional navigation map. The procedure for detecting the object, feature of the object-based images has been detailed. The concept feasibility of the method has been experimentally validated using a test setup that simulates a typical environment in the Wuhan Blind School. The experimental findings presented in this paper have been encouraging, which will help establish a basis for developing temperature filed-enhanced I Space in the future. Research is being directed towards integrating other physical fields in the experimental I Space test bed and its practical implementation.

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