

REAL TIME FACE DETECTION AND ROAD SIGN DETECTION FOR BLIND PEOPLE USING OPEN CV

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Abstract - In this task, a visually impaired individual's location system, Blind and Visually debilitated individuals discover challenges identifying snags amid strolling in the road, which makes it hazardous. The shrewd framework comes as a proposed answer for empowering them to see the world around. In this paper, we propose a keen arrangement in view of a camera associated with Raspberry Pi installed board which catches the picture of the hindrance to identify autos and people. The proposed framework recognizes a protest of intrigue and sends input as discourse cautioning message by means of a headphone. The test comes about accomplishing 96% right recognition exactness on people and autos location for ongoing testing with daze. The shrewd framework is of quick, minimal effort and lightweight

Key Words: Python, Raspberry Pi, Open Cv.

1. INTRODUCTION

There is unit quite 286 million of visually impaired and externally weakened folks among the world. Loss of vision, as a rule, is processed to lost freedom. One of the chief essential problems is that visually impaired folks comprehend drawback exploring viably in Associate in Nursing new setting. Outwardly weakened and visually impaired folks place trust in outside encourage that might be given by folks, management pooches, or uncommon electronic gadgets as showing emotion supportive networks for basic leadership. As of late, Researchers have gotten some instrumentation and cryptography framework devices to assist the visually impaired. For instance, question discovery and acknowledgment area unit essential in Electronic Travel Aids (ETA) that admit AI procedure, conspicuously laptop vision to assist build up a routing framework for externally weakened

2. LITERATURE REVIEW

Many previous image processing methods discard low-frequency components of images to extract illumination invariant for face recognition. However, this method may cause distortion of processed images and perform poorly under normal lighting. Although 3D face imaging is increasingly popular, many 3D facial imaging systems have significant noise components which needs to be reduced by post-processing if meaningful recognition results are desired.

Biometric image recognition is the process of studying the closest match region in between the examining images. The study of the recognition is done about the spatial pixels (picture element) among the image. Recognition of two different biometric features, finger print and face images are attempted.

One of the major challenges encountered by current Face Recognition (FR) techniques lies in the difficulties of handling varying poses and illuminations. In this paper we propose three novel techniques, viz.

Face Recognition (FR) under varying lighting conditions and pose is very challenging. This paper proposes a novel approach for enhancing the performance of a FR system, employing a unique combination of Active Illumination Equalization (AIE), Image Sharpening (IS)

The appearance of the face varies drastically when background, pose and illumination change. Variations in these conditions make Face Recognition (FR)

3. METHODS AND MATERIALS

The properties of Viola-Jones computation that create it a not unfortunate identifying proof computation are:

1. Robust – high acknowledgment rate (certifiable positive rate) and low false-positive rate faithfully.
2. Real-time - For possible applications no below a pair of diagrams for systematically have to be compelled to be restricted. Face identifying proof solely (no affirmation) - The goal is to understand faces from non-faces (disclosure is that the underlying amount of the affirmation methodology).

Optical move or opticflow is that the case of clear improvement of things, surfaces, And edges in a particularly visual scene as a result of the relative improvement in a viewer and a scene. The term optical flow is moreover used by roboticists, connexion associated techniques from photograph preparing and administration of route in conjunction with improvement place, question division, time-to-contact records, consciousness of growth figuring's, luminance, improvement stipendiary adventure story composing, and stereo un similarity estimation

4. ARCHITECTURE DIAGRAM

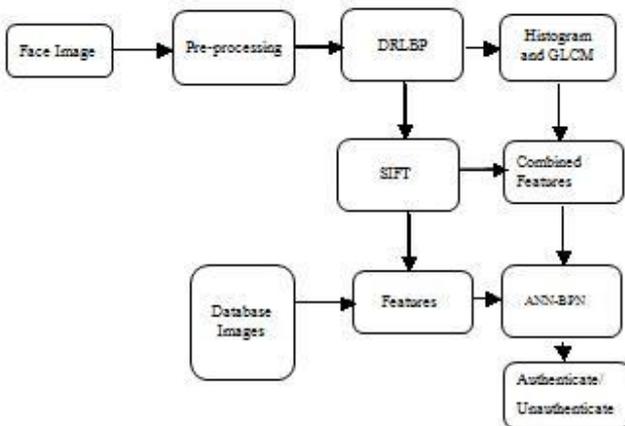


Fig -1: architecture diagram

4.1 PREPROCESSING AND NORMALIZATION

Normalization is the machine of organizing information between a databases. This includes developing tables or setting up relationships of those tables in accordance with an imitation of regulations designed each in keeping with guard the records but according with making the database more flexible via eliminating redundancy and irrelevant dependency.

Statistics preprocessing is an information mining method that includes remodeling raw records right into a comprehensible format. actual-international records is often incomplete, inconsistent, and/or missing in positive behaviors or traits, and is possible to comprise many mistakes. information preprocessing is a proven technique to resolving such troubles.

4.2 DRLBP AND SIFT

We show companion absolutely specific rotate invariant and computationally compelling floor descriptor alluded to as Dominant became local Binary sample (DRLBP). A Rotate perpetual exceptional is knowledgeable via the method the descriptor with reference to a reference in an incredibly passing near the world. A reference rushes to enlist maintaining the method truthful the native Binary patterns (LBP). The organized technique not totally holds the whole helper information isolated by way of LBP, still, it in like way receives the vital records intentionally the important information, on these traces accomplishing masses of separation management. For epitomize in associate sudden technique, we will be predisposed to generally tend to drench up a phrase reference of the primary adequate of the time going on plans from the association photographs and wipe out tedious and non-illuminating alternatives.

The scale-invariant feature transform (SIFT) proposed by Lower has been widely and successfully applied to object detection and recognition.

4.3 GLCM

GLCM is a mathematical approach used for the statistical texture evaluation. GLCM texture measurement is proposed through Haralick with distinct fourteen textural features. GLCM computation may be achieved in 4 instructions $d = 0^\circ$, $d = 45^\circ$, $d = ninety^\circ$, $d = 135^\circ$. inside the proposed work $d = zero^\circ$ is used for feature extraction. The work is applied with the aid of the use of all of the fourteen textural features of GLCM, which includes Angular 2nd second, evaluation, Correlation, Sum of squares, Inverse distinction moment, sum of average, Sum variance, Sum Entropy, difference Variance, difference entropy, statistics measures of correlation, maximal correlation coefficient. The unique facts set is decreased through sure capabilities size. GLCM extracts statistical texture features. wide variety of operations required to compute anybody of those capabilities is propositional to the variety of decision cells inside the image. In GLCM Co-happening pairs received via selecting θ same to 0° would be much like those received by way of selecting θ equal to one hundred eighty $^\circ$. For GLCM dimension determination grey fee of the pixel and gray degrees are vital The textural functions summarize the relative frequency distribution describes how regularly one gray tone will appear in a particular spatial dating to some other gray tone at the picture. the following equations define these textural functions [13][14]. Fourteen Haralick functions are used for characteristic extraction

The Haralick textual Features are as follows

Energy: It is for a measure the homogeneousness of the image and can be calculated from the normalized COM. It's miles an appropriate measure for detection of disorder intexture photo.

$$f1 = \sum_i \sum_j \{ p(i, j) \}$$

Entropy: Entropy measures the complexity or disorder of the picture. Complicated textures have a tendency to have excessive entropy. Entropy is strongly and inversely correlated to Electricity

$$f2 = - \sum_i \sum_j p(i, j) \log(p(i, j))$$

Contrast: Comparison measures the spatial frequency of a photograph. It is the distinction between highest and the bottom values of a contiguous set of pixels

$$f3 = \sum_i \sum_j (i - j)^2 p(i, j)$$

Correlation: Assessment measures the spatial frequency of a photograph. It is the difference between a maximum and the bottom values of a contiguous set of pixels

$$f4 = \frac{\sum_i \sum_j (ij)p(i, j) - \mu_x \mu_y}{\sigma_x \sigma_y}$$

Homogeneity: This information is likewise known as an Inverse difference second. It measures the photograph homogeneity and assumes large values for smaller grey tone differences in pair factors. It has maximum cost when all of the elements in the image are identical

$$f5 = \sum_i \sum_j \frac{1}{1 + (i - j)^2} p(i, j)$$

The relaxation of the textural functions used within the characteristic extraction consists of a sum of common, sum of entropy, a sum of variance, difference variance, difference Entropy, maximum Correlation coefficient, data measures of correlation are secondary and derived from those functions which might be indexed above.

4.4 LOCAL BINARY PATTERN

Gap the window into cells (e.g. 16x16 pixels for every cell). For every element during a cell, analyze the element to everyone of its eight neighbors (on its left-top, left-center, left-base, right-top, etc.). Follow the pixels on a circle, i.e. right-handed or counter-clockwise. Where the middle pixel's worth is larger than the neighbor's worth, express "0". Something else, express "1". this provides associate degree 8-digit binary range (which is typically born-again to decimal for accommodation)

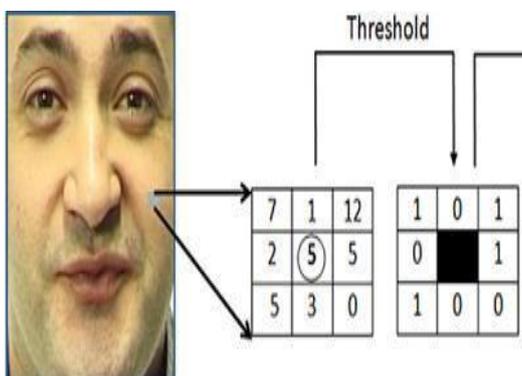


Fig -2: Local Binary Pattern Extraction

4.5 ARTIFICIAL NEURAL NETWORK

Neural networks observe a dynamic manner shape and do no longer abide with the aid of a honest technique to derive a preferred output. the basis for the ones networks originated from the natural nerve cellular and neural structures – each nerve cell takes in multiple precise inputs and produces one output

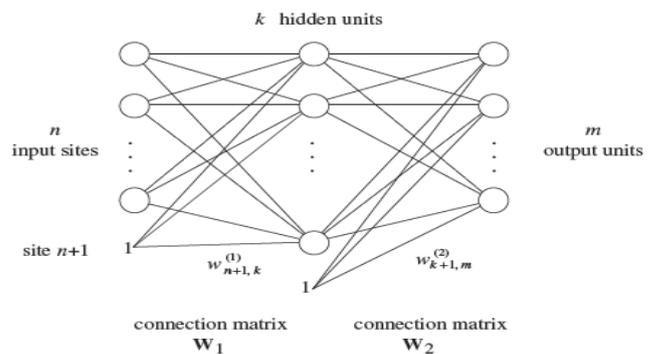


Fig -3: neural network structure

BACK-PROPAGATION NETWORK

The execution of the back-Propagation arrange was assessed regarding preparing execution and grouping correctnesses. Returned Propagation set up offers brief and actual order and is a promising apparatus for grouping of the tumors. Returned engendering calculation is at long remaining applied for grouping the example of a dangerous and favorable tumor. The returned-proliferation getting to know standard can be utilized to alter the weights and tendencies of systems to restriction the aggregate squared mistake of the gadget. The lower back-engendering calculation is applied to sign in the critical amendments, inside the wake of picking the weights of the machine haphazardly

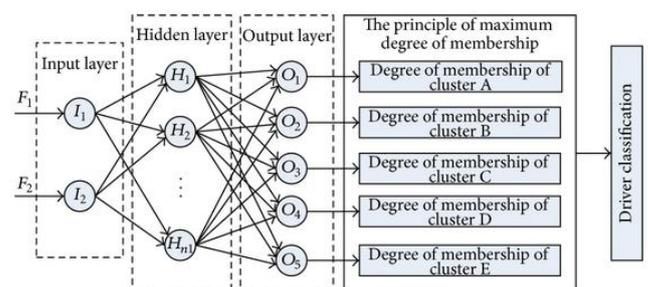


Fig -3: Back-Propagation network structure

4.6 THRESHOLD SEGMENTATION

Shading footage will likewise be thresholded. One approach is to assign a special limit for every of the RGB segments of the image AND at the moment be a part of them with an AND activity.

This mirrors the approach the camera works and the way the data is place away within the laptop, nevertheless it does not compare to the approach that people understand shading.

In this approach, the HSL and HSV shading models area unit all the a lot of oft utilized; observe of that since tone may be a spherical quantity it needs roundabout thresholding.



Fig -3: Threshold effect

5. BLOCK DIAGRAM

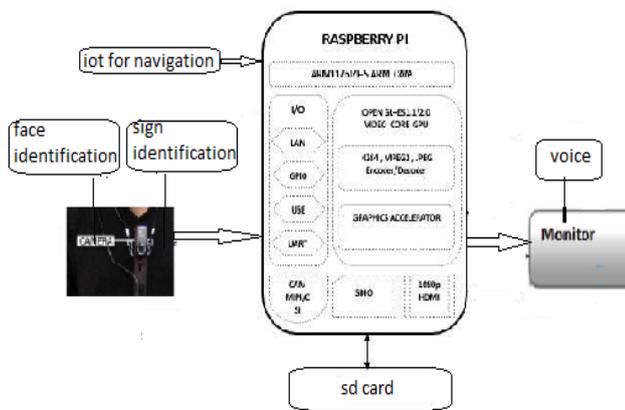


Fig -7: Architecture diagram of Raspberry Pi

5.RESULTS AND DISCUSSIONS

The use of vibrotactile stimuli with temporal coding for conveying directional information with handiest tractors is viable and achieves an angular decision sufficient for navigating in an interactive manner. some of the stimulus ideas tested, a code based on a joint version of modulation frequency and modulation duty cycle became associated with accurate overall performance and suitable for non-forestall stimulation, especially if the character stimulus-to-reaction dating ends up accounted for. For singular activities, a code relying on the temporal shift amongst vibration epochs on the 2 facets additionally confirmed authentic

consequences after participants have been informed approximately the reason.

The consequences suggests the proposed techniques given exceptional overall performance in distinguishing faces so that we are able to amplify our challenge for numerous programs in each day life's. Based at the built sub-regions, a local-and-worldwide combined matching approach is used for face recognition. with the aid of seeing the Graphs we can say that the DRLBP shown superb performance than RLTP in distinguishing the faces

6. CONCLUSION

regular face reputation and avenue signal location for dazzle individuals using OpenCV suggest that the sound (either call of the man or woman or avenue signal) is introduced to direct the visually impaired individuals by recognizing the road symptoms and human face gradually. This thing works with the help of local Binary sample and GLCM which drives their regular lifestyles freely. This strategy gives excessive exactness and best final results.

7.REFERENCES

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