

Efficient Scale invariant and Back Propagation Neural Network method using LIP Region Segmentation

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Abstract: With the advent of technological sensor devices and human interface machine technology, there has been extensive research done in lip segmentation methods by several researchers — some linguistic features required for interaction with the machine equipment. Therefore, research work has been done in the audio speech detection scheme for recognition of lip reading. Visual lip reading technology developed based on the extraction of features of the lip. Lip segmentation is essential to approach to recognize lip reading scheme. Meanwhile, it helps improve parameters. Several methods studied to segment the lip area based on localized active contour method using twice contour finding and combined color-space method. Apply the illumination histogram equalization to real color images to reduce the distortion of uneven illumination. The proposed method implemented can get better accuracy rate and segmentation results and compare with the existing process using area or circle as the region to segment grayscale images and combined in the color-space image. The main advantages of this SIFT and BPNN method of this technique is the results of lips because the inner region found. The experiment tool is used MATLAB 2016a and designs a PROJECT APPLICATION. Improve the success rate and reduce the segmented error and compared with the current metrics.

Keywords: Lip Segmentation, Feature Extraction – Scale Invariant Feature Transformation, BPNN – Back Propagation Neural Network, and Active Contour.

INTRODUCTION:

In the modern world of technology, Graphical lip detection has been done through the association of the equipment visualization and observation of the language [1]. In lip detection, images or the video of the face are captured through equipment and after that features of the mouth are extracted and then recognize the accents of the characteristics of the mouth through detection method [2][3]. Human system interaction, pattern detection, and artificial intelligence have become a common area of research that overcomes the issue of the detection value of speech detection scheme that occurs due to interference or distortion [4]. Picture segmentation is the method of the segmentation of the digital picture into various segments [5]. Lip segmentation is an essential method of the visualization lip detection scheme; exactness of lip segmentation improves the detection value or rate. Segmentation depends on the features like as segmented pixels on area and borders, statistical data, the average weight of the segmented area [6][7]. By the medical theory of China, the color of the lip of an individual is taken as the marks and indicators if the stomach is in good physical shape or not [8]. Therefore, computer technology can determine the relationship between lip color and illness through lip segmentation process [9][10]. Lip segmentation process categorized into two types which identified through color or intensity area. The kind of approach utilizes color conversion or color filtration by extending the change among the field of lip and area of non-slip.

LITERATURE SURVEY:

Lu Y and Liu, Q et al., 2018[16] proposed research on local active contour method utilizing basic contour by linking color areas. A brilliance parallelization applied towards RGB pictures for reducing the distortion. Color space was associated that contains the U-element and mean of the two d1 elements and d2 of the film afterward transformation. Selection of the underlying parallel contour was because of the same form towards the nearest lip area. They used the semi ellipse as the basic contour of internal and external borders. Color elements linked to acquiring the segmentation output. Performance metrics include segmentation output where comparison as basic contour to fragment gray picture and picture in linked color area.

Liu G and Li, H. et al., 2018 [17] studied the mass matrix development technique for the enhancement of the toughness of the contour development. Chunk matrix contains contours of the formal selection and silhouette of shape and also a standard pattern for measurement of the forms. By decreasing the standard matrix restraints, active contour method implemented. Also, way prior segmented in the form of the blocks. Experimental analysis was done based on the proposed approach for improvement of the active contour method and improving the flexibility of the series of the segmented lip region image.

Wang L., Chang, Y., Wang, H., Wu Z., P u, J and Yang, X et al., 2017 [18] established a new area based contour method that depends on the two various native fixed pictures by building native hybrid picture fit power. Hybrid image decreases the modification phase for monitoring contour curvature to required borders. In this research, the proposed approach on the evaluation and comparison of various active contour methods towards segmentation of the actual pictures along with multiple strength features. The preliminary analysis does for demonstration of the performance of the exactness of the segmented image.

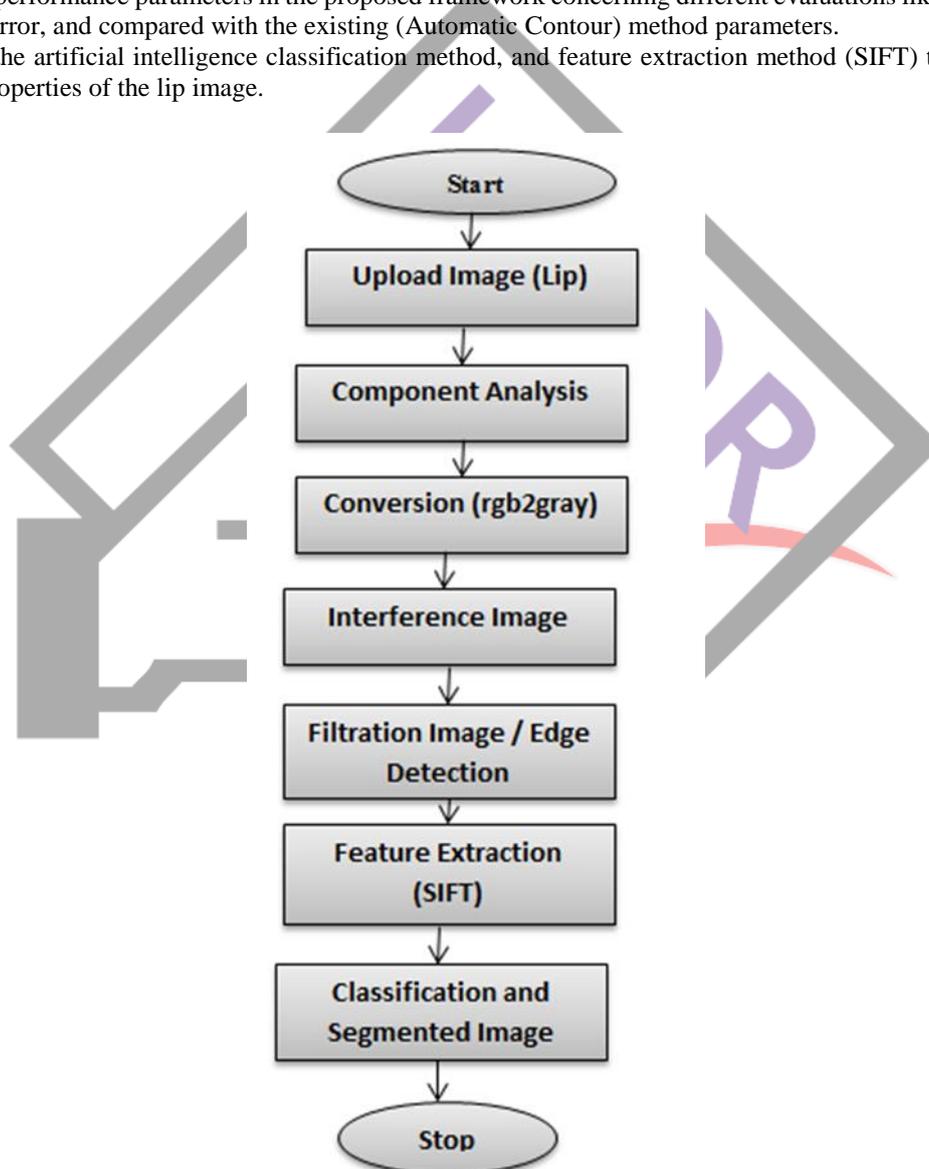
Shelli L and Mengxing.al, H. et al.,2018[19]proposed research on the geometrical active contour method for removal of the deprivation issue of lower compact, fuzzy and color interference of under picture information. Picture segmentation approach was enhanced, and also a numerical method of underneath water depends on Picture segmentation approach .In this research, the experimental analysis was done based on the whole segmentation underneath water pictures by mean of lower gap and fuzzy characteristics that acquire desired segmentation output.

X u W., Y u e, X., Chen Y, and Reformat, M et al., 2017 [20] demonstrated the standard method for improvement of contour-based segmentation method. The optimum division acquired by maximization of the mass shared data among possible delivery of numerous segmented output. Performance analysis does base on the validation that collaboration of the contour basis segmentation towards partial initialization and production of the static output for contour segmented pictures.

PRELIMINARY STEPS FOR DISEASE DETECTION:

In this section, explain the proposed work in stepwise. The Objective of the proposed work is defined as follows:

- (i) To study and analyze the existing methods (ACM and LACM) for Lip segmentation methods.
 - (ii) To design feature extraction using the SIFT algorithm to find the unique features, BPNN to classify the features based on crucial points.
 - (iii) To evaluate the performance parameters in the proposed framework concerning different evaluations like accuracy, Segmented Error, Overlap error, and compared with the existing (Automatic Contour) method parameters.
- It has implemented the artificial intelligence classification method, and feature extraction method (SIFT) to segment and feature extract the unique properties of the lip image.



Research Methodology steps are;

- (i) To collect the dataset AR face Image from an online site (UCI machine learning repository) website using FACE images in .jpg format.
- (ii) Upload the image from the dataset; convert the original image into gray scale image (rgb2gray) format. It reduces the image dimensionality of the defined image.
- (iii) Pre-processing phase implemented to calculate the binary image and remove the noise level in the given image.

- (iv) Segmentation image used to find the region of the smooth image and SIFT (Scale Invariant Feature Transformation) method used for image-based feature extraction from the input image.
- (v) I am applying the BPNN approach on the lip image to classify and segmented image.
- (vi) Compute the performance metrics and compared with the existing parameters such as accuracy rate, segmented error, and overlap error rate.

PROPOSED WORK:

The existing method is ACM can be classified into two classes:-

- (i) Edge Based Model and
- (ii) Region Based Model

Edge model accepted image gradient as limitation situation, which makes the contour to coverage to object border-line. Studies have implemented several techniques to enhance edge based models. These structures have incomplete convergence issue due to the fuzzy set and weak object area and noisy image.

Region-based methods are resistant to the noisy image. Its use image statistical data as limitation situation and the performance metric is superior to edge based models. In these methods can image segment based object region in the case of minimum or even without borderline.

Existing LACM technique using contour based region detection in a combined color-space image. Illumination histogram equalization method is applied to the real image (RGB image) to optimize the distortion consequence from uneven illumination.

In research work, has implemented a segmentation with SIFT and BPNN method. In SIFT algorithm used to extract the features based on key-points. It removes the image properties in the form of MATRIX format and read the image color features, which reduce the matrix of the real image in BPNN classifier method to train the feature vector and test the region based segmented boundary area. BPNN method used to classify the feature set and passed into three layers based on, (i) Input Layer (ii) hidden Layer and (iii) Output Layer.

In this model used to simulation function to filter the segmented boundaries in the given input image, and calculate the enhance success rate, reduce the error rate, and compared with the existing methods.

Section 1 described the lip segmentation plays a central role in Visual Lip Reading System because the segmentation consequence is vital to the recognition accuracy rate and segmentation error rate. Existing methods explained in detailed and two models used in lip segmentation (i) Edge based and Region-Based models.

Section 2 described that the prior work with various segmentation methods such as ACM and LACM etc.

Section 3 proposed that the novel method used in lip segmentation. SIFT algorithm is used to extract the lip region and borderline. BPNN classification used to classify the segment area.

Section 4 explained that the result and discussion and comparative analysis with performance metrics.

Section 5 described the conclusion and complete summary of the research work. Future scope means will tell about the new work in lip segmentation and visual lip-reading system.

CONCLUSION:

Lip segmentation technique based active contour segmentation that used for lip reading scheme. Picture analysis and the computer system does through a dynamic contour model. In lip image segmentation, contours achieved by acquiring the class borders by minimization of the fixed power. Hence, the geometrical contour model is complex than active contour method. For multiple images, it is not easy to prepare contour curvature. To overcome this issue differentiated various segmentation getting high-grade lip image segmentation. In research work, the proposed method implemented achieved a better accuracy rate and segmented results and compared with the existing process using area or circle as the region to segment grayscale images and combined in the color-space image. The main advantages of this SIFT and BPNN method of this technique is the results of lips because the inner region found. In proposed method implemented accuracy achieved 94%, and the error rate reduces with Segmented Error 14.1 and Overlap Error rate value is 79.73.

In future work can implement Filtration and contour methods to detect the region points and achieve the image quality parameter also (PSNR) and RMSE (Root Mean Square Error Rate).

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