

A Review on Development of Novel Algorithm by Combining Wavelet Based Enhanced Canny Edge Detection and Adaptive Filtering Method for Human Emotion Recognition

Aphasana Mulla¹ Kiran Paradeshi²

¹P.G. Student ²Associate Professor

^{1,2}Department of Electronics Engineering

^{1,2}P.V.P.I.T.Budhgaon,Sangli

Abstract— The conventional Canny edge recognition calculation is insensitive to commotion, along these lines, it's anything but difficult to lose powerless edge information when sifting through the clamor, and its settled parameters show poor versatility. In light of these issues, this paper proposed an enhanced calculation in view of Canny algorithm. This calculation presented the idea of gravitational field intensity to supplant picture inclination, and acquired the gravitational field force administrator. Two versatile threshold selection systems in view of the mean of picture gradient magnitude and standard deviation were advanced for two sorts of run of the mill pictures (one has less edge data, and the other has rich edge data) individually. The improved Canny calculation is straightforward and simple to figure it out. Experimental results demonstrate that the calculation can protect more valuable edge information and more vigorous to clamor.

Key words: Edge detection, Canny algorithm, Gravitational field intensity operator, Wavelet, Adaptive threshold

I. INTRODUCTION

Affective computing has gained enormous research interest in the development of human computer interaction over the past decades. With the increasing power of emotion recognition, an intelligent computer system can provide a more friendly and effective way to communicate with users in areas such as video surveillance, interactive entertainment, intelligent automobile system and medical diagnosis. The computer vision based pattern recognition techniques largely focus on facial features due to the importance of human perception of emotion through visual facial expressions. Each emotion corresponds to a unique facial expression, whose characteristics serve as the input to the classification system, and the output gives the machine-perceived emotion state based on various classification algorithms.

The performance of an intelligent system is directly affected by the extracted feature, such that the ideal feature representation should have large inter-class variation and minimum intra-class variation. A robust, automatic, and relatively low-cost emotion facial feature representation should be developed as a demanding need.

The image edges are important to represent the geometric information (such as size and shape of a facial component) of an image and edge detection is generally required for any further processing. Many geometric-based recognition algorithms can also make use of this information.

II. RELEVANCE

Human emotion recognition is beneficial for intelligent computer system to provide a more friendly and effective way to communicate with users. Emotions play an important role in rational actions of human being. There is a desirable requirement of emotion recognition for intelligent machine-human interfaces for better human-machine communication and decision making. Emotion recognition is also important in medical field for medical diagnosis.

There are several edge detection methods for human emotion recognition. But still accuracy and clarity are challenging tasks in order to obtain better emotion recognition. So, keeping in view wavelet based enhanced Canny edge detection method is used in combination with adaptive filtering. So, here main objective is to obtain enhanced results. Thus, proposed method is intended to achieve good performance by combining wavelet based enhanced Canny edge detection and adaptive filtering method. It is effective for human emotion recognition.

III. LITERATURE REVIEW

The method suggested by Bing Wang and ShaoSheng Fan is CANNY arithmetic operator has been proved to have good detective effect in the common usage of edge detection. However, CANNY operator also has certain deficiencies. Based on the analysis of the traditional CANNY algorithm, an improved Canny algorithm is proposed[11]. In the algorithm, self-adaptive filter is used to replace the Gaussian filter, morphological thinning is adopted to thin the edge and morphological operator is used to achieve the refining treatment of edge points detection and the single pixel level edge. The results of experiment show the improved CANNY algorithm is reasonable. But, the improved algorithm has the problem of heavy calculation.

The method suggested by GUO Lingyun, NAN Jingchang is the combination of wavelet transformation and adaptive median filter RAMF proposes a new method in place of the traditional Gaussian filter[9]. The method makes use of the wavelet transform in time - frequency analysis features and at the same time RAMF well protected edge of the smooth nature. Experiment results show that the proposed method performs better than the traditional method for impulse noise.

GengXin, Chen Ke, Hu Xiaoguang suggested the method of an improved Canny edge detection algorithm for color image. An improved Canny algorithm is proposed to detect edges in color image. This algorithm is composed of the following steps: quaternion weighted average filter, vector Sobel gradient computation, non-maxima suppression

based on interpolation, edge detection and connection. This algorithm outperforms other color image edge detection methods and can be widely used in color image processing[5].

The method suggested by WeibinRong, Zhanjing Li, Wei Zhang and Lining Sun is An Improved Canny Edge Detection Algorithm. This algorithm introduced the concept of gravitational field intensity to replace image gradient, and obtained the gravitational field intensity operator. Two adaptive threshold selection methods based on the mean of image gradient magnitude and standard deviation were put forward for two kinds of typical images (one has less edge information, and the other has rich edge information) respectively. The improved Canny algorithm is simple and easy to realize. Experimental results show that the algorithm can preserve more useful edge information and more robust to noise [1].

After applying different steps, we get a result of human emotion.

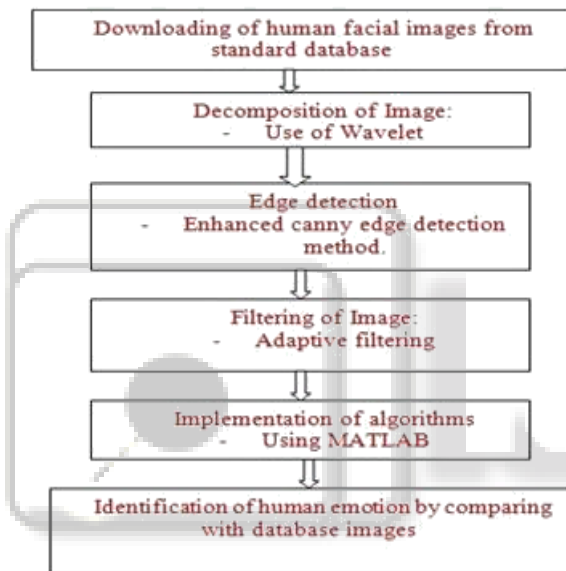


Fig. 1: Flow diagram of Human Emotion recognition

IV. PROPOSED WORK

A. Methodology:

- 1) Study the exiting human emotion recognition method.
- 2) Collection of five different emotions of human beings from standard database.
- 3) Development of wavelet based algorithm for decomposition of image.
- 4) Development of an algorithm based on canny edge detection technique.
- 5) Development of an algorithm for false edges detection which arises due to noise using thresholding technique.
- 6) Development of an algorithm based on adaptive filtering.
- 7) Implementation of algorithm may be by using MATLAB.
- 8) Identificaion of human emotion by comparing processed image with database image.

V. CONCLUSION

To obtain the good result in human emotion recognition we will develop and implement a novel algorithm for decomposition of images and for edge detection. Also we will implement an adaptive filtering method to minimize Laplacian of Gaussian noise. Human emotion is identified by comparing processed image with database image

REFERENCES

- [1] WeibinRong, Zhanjing Li, Wei Zhang and Lining Sun "An Improved Canny Edge Detection Algorithm"Proceedings of 2014 IEEE International Conference on Mechatronics and Automation August 3 - 6, Tianjin, China.
- [2] CAI-XIA DENG, GUI-BIN WANG, XIN-RUI YANG "Image Edge Detection Algorithm Based on Improved Canny Operator" Proceedings of the 2013 International Conference on Wavelet Analysis and Pattern Recognition, Tianjin, 14-17 July, 2013.
- [3] Yubing Dong, Mingjing Lib, Jie Li"Image Retrieval Based on Improved Canny Edge Detection Algorithm"2013 International Conference on Mechatronic Sciences, Electric Engineering and Computer (MEC)Dec 20-22, 2013, Shenyang, China.
- [4] GaoJie, Liu Ning "An improved adaptive threshold canny edge detection algorithm"2012 International Conference on Computer Science and Electronics Engineering.
- [5] GengXin, Chen Ke, Hu Xiaoguang"An improved Canny edge detection algorithm for color image"978-1-4673-0311-8/12/\$31.00 ©2012 IEEE.
- [6] ZhiweiTANG ,Dongqin SHEN "Canny Edge Detection Codec using VLib on davinciseries DSP"2012 International Conference on Computer Science and Service System.
- [7] E.Punarselvam, P.Suresh"Edge Detection ofCT Scan Spine Disc Image Using Canny Edge Detection Algorithm Based on Magnitude and Edge Length" 978-1-4673-0 132-9/11/\$26.00@2011 IEEE.
- [8] ShengxiaoNiu, Jingjing Yang, Sheng Wang, GengshengChen"Improvementand Parallel Implementation of Canny Edge Detection Algorithm Based on GPU" 978-1-61284-193-9/11/\$26.00 ©2011 IEEE.
- [9] GUO Lingyun , NAN Jingchang "Canny Edge Detection Algorithm based on Wavelet Transform and RAMF" 978-981-08-6322-7©Memetic Computing Society ICCP 2010Proceedings.
- [10]Huili Zhao, Guofeng Qin, Xingjian Wang"Improvement of Canny Algorithm Based on Pavement Edge Detection"2010 3rd International Congress on Image and Signal Processing (CISP2010).
- [11]Bing Wang, ShaoSheng Fan "An improved CANNY edge detection algorithm" 2009 Second International Workshop on Computer Science and Engineering.