

MATLAB BASED MULTI FEATURE EXTRACTION IN IMAGE AND VIDEO ANALYSIS USING HISTOGRAM EQUALIZATION AND TRUE WAVELET COMPRESSION TECHNIQUES

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Abstract - Numerous individuals can't bear to have costly cameras to record their dazzling minutes and in some cases they have taken stunning pictures yet they found of late the picture was not clear or gleamed. Numerous products are in the market, for example, Photoshop and other are costly to purchase by normal individuals. These products are great with their highlights yet as it is mentioned before they are costly and for this situation, it is a major issue for standard individuals. This paper provides a solution by using MATLAB. The paper mainly focusses on four major Image and Video processing techniques- Improving the quality of image and video clips using Histogram equalization techniques, Changing Image and Video format to another format by using MATLAB program, Resizing the Image and Video by using MATLAB program, Compress Image and Video using WAVELETs by true compression techniques. All these Image and video processing features will be combined in one software where in one click the user can do whatever he wants. This paper compares the existing techniques where in the authors have focused only on one feature whereas the proposed paper focused on four major features which are combined in one to make the life simpler and is free of charge.

Key Words: MATLAB, Histogram equalization, Image and Video, Wavelets, Compression

1. INTRODUCTION

The digital technology has revolutionized all the areas to simplify the lives of people. As mentioned in [2], the advent of digital technology has transformed the traditional methods to e-methods such as Medical health care to e-medical health care, banking to e-banking etc. Beside the tremendous features of digital

technology, still there exists a major issue that needs to be resolved in near future. Another paper [3] mentioned the importance of digital technology in household scenarios such as Digital cameras where every wants to take pictures and wants to see a good quality in it. The paper also discussed the Image resizing techniques that are used to make the image to be resized. In one of the article [5], A new technique is discussed considering wireless sensor networks as an application where wireless cameras are installed and difficult to enhance the observations. For this, 3D compression –oriented image contention model is applied. In this paper, the following section discusses the existing techniques, proposed technique and simulation results. The proposed method shows the simulation results where all the features have been combined, software is developed to test the working of the four features on one click. It is exceptionally discernible that the general populations everywhere throughout the world have moved toward becoming utilizing photography especially to report the snapshots of their day by day lives [1]. Because of the huge blast in the realm of innovation, it has made rivalry between the organizations to produce distinctive sorts of cameras which contrast from each other as far as highlights and qualities. The distinction in camera includes brought about a distinction in picture and video lucidity, which prompted utilizing a portion of the altering programs which is fetched an exertion and time to accomplish a somewhat higher level of clearness than the first picture. Picture and video investigating utilizing MATLAB are planning to handle the picture and video cut which were taken from various cameras [2]. Likewise, the task will have an element to change the configuration to other, resize the photo, and compacting the photo and video cut. The

MATLAB programming is utilized to examine the information which can be a picture or video cut and improve them as conceivable through the matrix method, the MATLAB process as shown below.

Image Representation [6]

Images can be represented in any form such as in 2D or 3D but the images are normally represented in 3D form. Normally the images are represented in a rectangular form and each rectangle will have a pixel and value. The range of the value will be from 0 to 256

Quantization [7]

In this method, an image pixel is represented either in binary form, Intensity and RGB. The Image in binary form is represented in two values such as 0 and 1 whereas intensity is represented by brightness. The RGB format is red, green and blue

Point Processing [8]

Point processing is one of the methods in Image enhancements. The purpose of image enhancements is to get more clear quality of image and video. Point processing is a technique which takes image intensity values. Using certain transformation techniques, the values are changed using particular transformation techniques

Region Processing [9]

In this method, a technique called convolution method is used where the images are smoothen and sharpen for every pixel. A method called Prewitt and sobell is used to check the photo edge quality by applying through high pass edge detection method.

Image Processing [10]

In this step, the yield estimation of every pixel will be checked utilizing the info esteem as source of perspective. The Fourier Transform will be utilized to check all abundancy of the cosines and sines which are exhibited in the photo and the converse Fourier change will be to recoup the first information. The high -band channel will be utilized to expel the commotion

because of the inadmissible movement from the client or unexcited concentration to the objective.

2. EXISTING WORK

The paper [2] discusses about resizing the Image using simple Addition and subtraction methods. This method is applicable only in health care. However this paper does not discussed anything about the Image quality when resized. Another paper [3] has discussed the Image resizing techniques such as Compression and Discrete Cosine transform but it does not discussed anything about the quality of the Image. In one of the article, Image compression technique is discussed where the authors have mentioned 3D Compression method. However, the paper is specific to an application and focused on only one feature enhancement. In another article [6], The authors have focused on Image compression based on frequent pattern mapping. The mechanism discussed by the authors is based on clustering mechanism and this paper can be adapted to implement image compression in the proposed paper. In one of the article [7], the authors have compared various techniques for Image compression such as DWT, DCT, BTC and SVD. However this paper talks about the efficiency of these techniques and does not give any specific solution to the optimum image compression technique. In another article [8], Image compression technique is implemented using enhanced version of DCT and it is mentioned in the article that it outperforms JPEG and JPEG 2000. However in article [9], the MATLAB program is outlining base on four activities which are consistent cloning, neighborhood enlightenment changes, surface levelling and consistent tiling to blended two pictures. The program will begin by choosing two pictures and afterward cloning task will be utilized to duplicate the components from the primary picture to the second one as appeared in Figure below 1. From that point onward, the other three activities will be utilized as a part of arrangement to get a photo resemble a unique. This approach is unbending on the grounds that it relies upon changing unique picture which can be utilized for unlawful purposes. The picture and video Analyzing utilizing MATLAB undertaking will enhance the photo quality by

applying some channel to evacuate the commotion as opposed to including an additional component. Whereas in article [10], the framework is planning to expel the clamor from the picture which can be happen because of temperature, interfacing in the channel, transmission technique by utilizing five diverse smoothing channels which are middle channel, vector middle channel (VMF) [16], fundamental Vector Directional Filter (BVDF), spatial middle channel (SMF) [17], and changed Spatial Median Filter (MSMF) [18]. These channels are called picture combination method. The Framework will begin by detecting the photo and afterward go the photo through the five calculations channels to expel the clamor and keeping the critical element with no impact. This approach is inflexible on the grounds that it utilized just channel office. The picture and video investigating utilizing MATLAB venture will have more offices, for example, resize, designing changing and notwithstanding the separating.

by using in write functions. To develop a software that could resize any kind of Image and vide using imresize functions. To develop software that could pick Image and video and applying a technique called wavelets compression technique. This technique is not only help in image processing but also in signal processing. A flowchart is shown in Figure 25 that depicts the idea of the paper. To accomplish this objective, water fall methodology is adapted which is best suitable for software based research. This type of methodology has its own benefits such as simple and easy to understand. It is easy to manage. This methodology has the advantage of time saving since it goes step by step and also the testing process is very easy. The implementation of the proposed work is carried out in different phases as shown in the figure below.

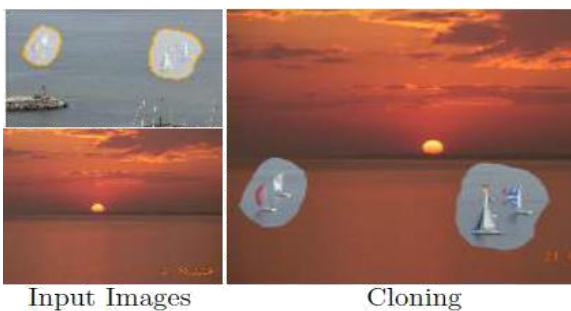


Fig 1 : Poisson Image Editing

PROPOSED WORK

The principle goal of this work is to outline a product utilizing MATLAB to alter a photo and video cut. The Image and Video Analyzing utilizing MATLAB will help to extract whatever the features a user wants. Below are the tasks that is accomplished to design a software that is used to extract the feature in one click. To develop a program and to apply MATLAB to enhance the nature of picture and video quality by utilizing Histogram Equalization method (Histeq-procedure). To develop a program that can change the Image and video formats to any other formats that the user want

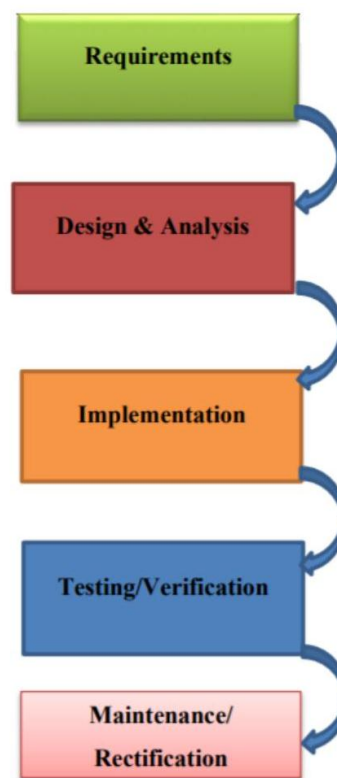


Fig 2: Water fall methodology

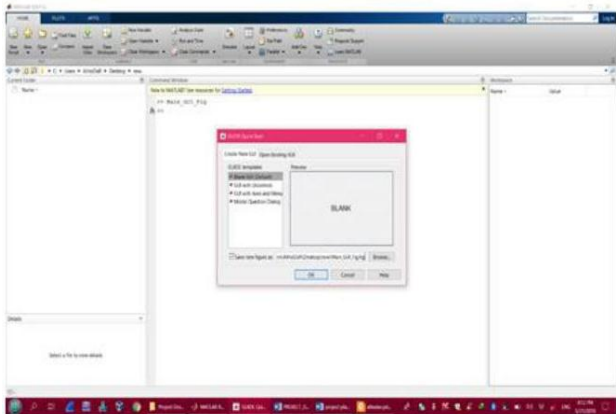


Fig 3: GUI Tool in MAT LAB

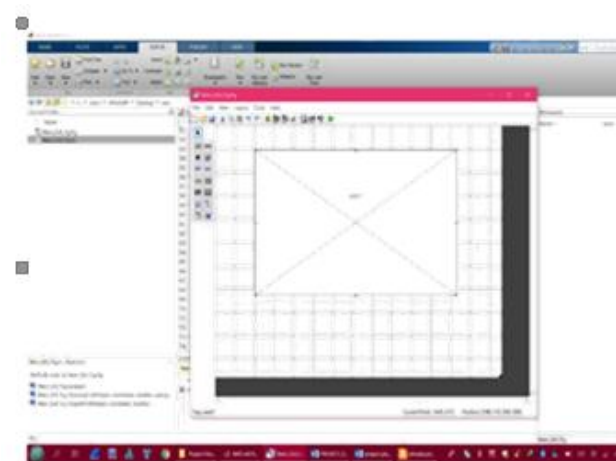


Fig 4 : Design page of GUI tool



Fig 5 : The main design of project software



Fig 6: Ahmed's Picture used For Testing



Fig 7: The above image is enhanced using Fotors website



Fig 8 : Ahmed picture enhanced by image and video Analyzing using MATLAB



Fig 9 : Dark image taken at night

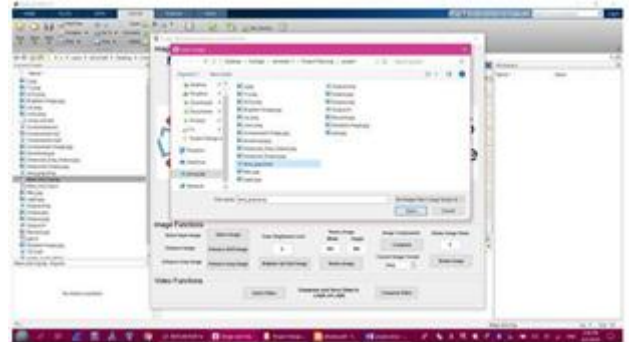


Fig 12: Selecting an Image

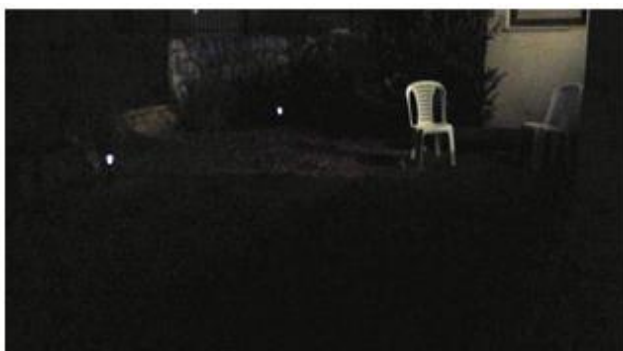


Fig 10: Dark Image enhanced using Fctors Image



Fig 13: Identifying RGB image

The figure below shows how the software will enhance images



Fig 11: Dark Image enhanced using MATLAB



Fig 14: Enhancing image

The implementation of the Image and Video Analyzing using MATLAB software is shown below. In the figure below the software shows how to pick an image.

The figure below shows how Resize button will resize an image.



Fig 15: Resizing Image



Fig 18: Different in size after compressing



Fig 16: Brighting image manually



Fig 19: Enhancement of a dark image

The figure below shows the software compresses an image



Fig 17: Compressing image



Fig 20: Rotating an image

The figure below shows the software when selecting a video to compress it.



Fig 21: Selecting video clip.



Fig 22: During compressing process.

The figure below shows the software after compress process is completed.



Fig 23: Compressing process completed

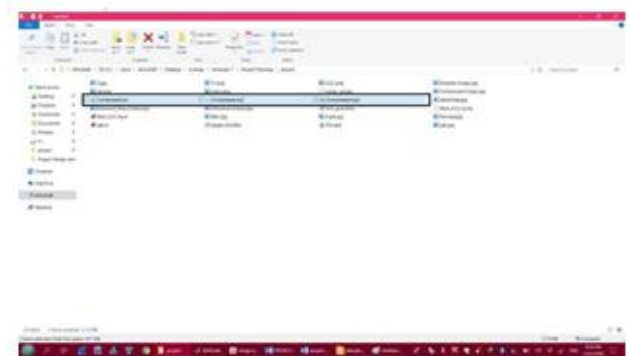


Fig 24: Compressing process completed

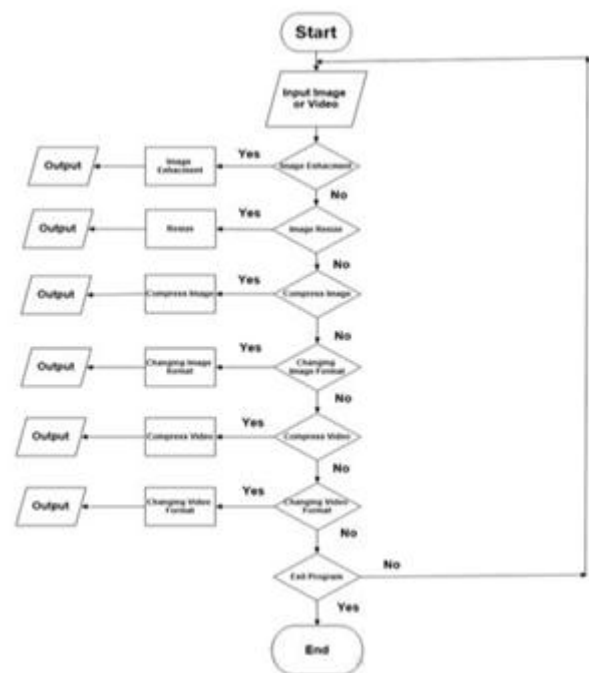


Fig: 25 proposed Flowchart

CONCLUSION

This paper utilizes a MATLAB programming to build up the quality level for the picture and video cut from a camera or even spared pictures or recordings in your hard drive. The framework has an element to choose picture and improve it utilizing Histogram Equalization strategy, resize it utilizing imresize work, change the organization utilizing imwrite capacity and arrangement required. The framework will process the component without impact on the picture or video quality level. Packing the two pictures will utilize wavelet method and that will spare space on PCs. The benefit of this task is to give an abnormal state of the

nature of the picture and video. This task can be utilized by any individual who intrigued by photography. The task can be generally utilized as a part of photographic shops.

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REFERENCES

- [1] N. A. Loan, N. N. Hurrah, S. A. Parah and J. A. Sheikh, "High Capacity Reversible Stenographic Technique based on Image resizing and pixel permutation," in 2017 Fourth International Conference on Image Information Processing (ICIIP , Shimla, India, 2017).
- [2] J. Mukhopadhyay, "Image resizing in the compressed domain," in 2017 International Symposium on Signals, Circuits and Systems (ISSCS), Iasi, Romania, 2017.
- [3] X. Yang, Y. Wen, D. Yuan, M. Zhang, H. Zhao and Y. Meng, "3D Compression-Oriented Image Content Correlation Model for Wireless Visual Sensor Networks," in IEEE Sensors Journal, 2018.
- [4] Y. Lin, Y. Niu, J. Lin and H. Zhang, "Accumulative Energy -Based Seam Carving for Image Resizing," in 2016 17th International Conference on Parallel and Distributed Computing, Applications and Technologies (PDCAT), Guangzhou, China, 2016.
- [5] P. Gajitzki, "A new digital image resizing method based on Wavelets," in 2014 11th International Symposium on Electronics and Telecommunications (ISETC), Timisoara, Romania, 2014.
- [6] Q. Deng, S. Wu, J. Wen and Y. Xu, "Multi-level image representation for large-scale image-based instance retrieval," in CAAI Transactions on Intelligence Technology (Volume: 3, Issue: 1, 3 2018), 2018.
- [7] D. Kim, D. Cho, D. Yoo and I. S. Kweon, "Learning Image Representations by Completing Damaged Jigsaw Puzzles," in 2018 IEEE Winter Conference on Applications of Computer Vision (WACV), USA, 2018.
- [8] J.-C. Ni, Q. Zhang, Y. Luo and L. Sun, "Compressed Sensing SAR Imaging Based on Centralized Sparse Representation," in IEEE Sensors Journal, 2018.
- [9] S. Abbas, M. Irshad and M. Z. Hussain, "Adaptive image interpolation technique based on cubic trigonometric B-spline representation," in IET Image Processing, 2018.
- [10] X. Zhang, J. Sun, S. Ma, Z. Lin, J. Zhang, S. Wang and W. Gao, "Globally Variance-Constrained Sparse Representation and Its Application in Image Set Coding," in IEEE Transactions on Image Processing, 2018.
A. Kadimisetty, C. Oswald and B. Sivaselvan, "Frequent Pattern Mining Approach to Image Compression," in 2016 22nd Annual International Conference on Advanced Computing and Communication (ADCOM), Bangalore, India, India, 2018.
- [11] U. Bhade, S. Kumar, P. Dwivedy, S. Soofi and A. Ray, "Comparative study of DWT, DCT, BT C and SVD techniques for image compression," in 2017 International Conference on Recent Innovations in Signal processing and Embedded Systems (RISE), Bhopal, India, India, 2018.
- [12] M. L. Hachemi, M. Omari and M. Baroudi, "Enhancement of DCT -Based Image Compression Using Trigonometric Functions," in 2018 International Conference on Computing Sciences and Engineering (ICCSE), Kuwait, 2018.

- [13] J. M. D. Martino, G. Facciolo and E. Meinhardt-Llopis, "Poisson Image Editing," in Image processing on line Journal, 2016.
- [14] B. S. B. D. J Harikiran, "Impulse noise removal in digital images," International Journal of Computer Applications , vol. 0975-8887, 2011.Y. Yang, M. Yang, S. Huang, M. Ding and J. Sun, "Robust Sparse Representation Combined With Adaptive PCNN for Multifocal Image Fusion," in IEEE Access, 2018
- [15] Y. Lu, C. Yuan, Z. Lai, X. Li, D. Zhang and W. K. Wong, "Horizontal and Vertical Nuclear Norm-Based 2DLDA for Image Representation," in IEEE Transactions on Circuits and Systems for Video Technology, 2018
- [16] M. Ghamchili and H. Ghassemian, "Panchromatic and multispectral images fusion using sparse representation," in 2017 Artificial Intelligence and Signal Processing Conference (AISP), Iran, 2018.