Journal of Data Acquisition and Processing
ISSN: 1004-9037
https://sjcjycl.cn/
DOI: 10.5281/zenodo.777477

DIGITAL IMAGE PROCESSING

Raksha[1], Yogendra Singh[1]
[1]Department of Electronics and Communication Engineering, Anand International College of Engineering, Jaipur, India
Email: raksha149@gmail.com , yogi.choudhary89@gmail.com

Abstract- The subfield of system and signal focus on a particular image. Image restoration is removing noise and other artifacts from an image. This is why the picture quality is vey clear. Digital image has to be improved there image and process the system of there efficient algorithms. Adobe Photoshop is the rare example of digital image. In the digital image, processing it is the one of the broadly used application. In the electrical engineer signal processing is deal with a digital signal and analogue processing. This signal transmits the signal.sounds, image.Digital image deals with the input and output image, which is done with there processing of image.

KEYWORDS-digital, greyscale, processing, satelite, image

I. INTRODUCTION

Digital image processing (DIP) is the use of computer algorithms and it is manipulate to improve there quality. It is extract useful information from digital images and composed of a grid pixel. Grid pixel of each in represents specific color shed of grey.It is a use of process digital image of an algorithm.DIP is used in a variety of an application, such as medical image,satelite imagery analysis, security system, and digital photography. DIP continuous involve with new techniques and algorithms. It is handle increasing complex diverse types of digital image.

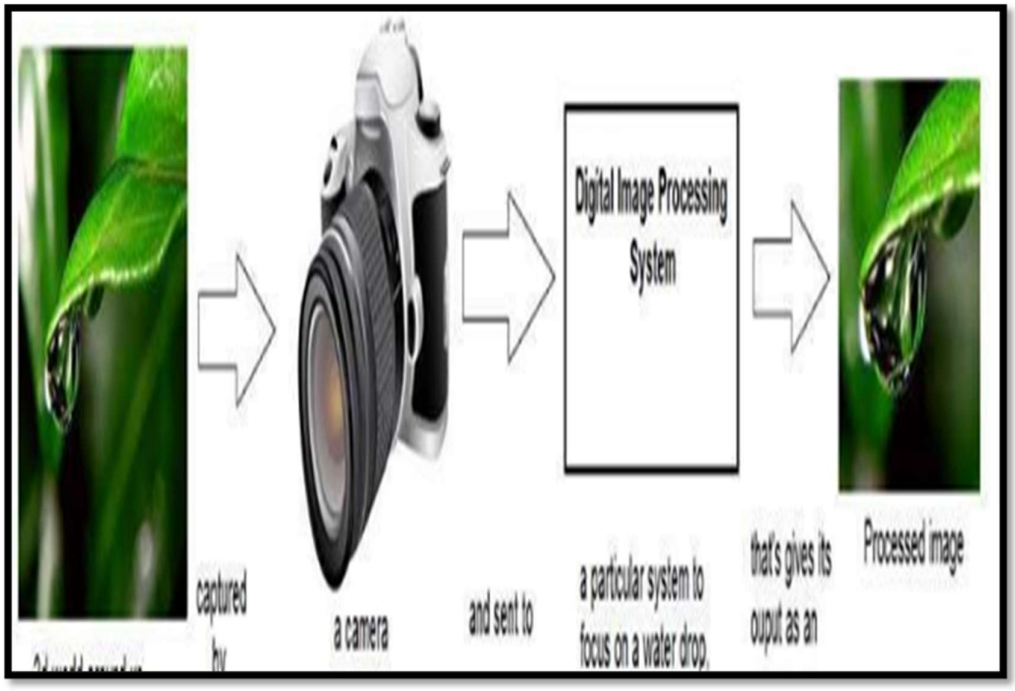

Figure 1: Digitalization of image

(Source: 2)

Digital image has many advantages like analogy image is over processing DIP algorithms can be used in variety of platforms. The above image is enhancing, which is a visual quality of an image. It is adjusting there improving brightness quality.

II. OBJECTIVES

1) To transform the image in the direction of digital form.
2) To edit the image into retouching
3) To use the image enhancement
4) To shaping the image and restoration
5) To use in adobe Photoshop
6) To use for encoding and robot vision

III.METHEDEOLOGY

DIP is with digital images deals with manipulating algorithms through the image. It is necessary to processing there step in many application.Recognization, image compression and object detection is the use of an application. Image processing follow the including steps such as manipulating and analyzing, acqusition of a image tool [10].The image can altered for an output of result which is based on analyze for image.

Compression of an image and encoding the amount of data which is described save the image and transmit the image. The processing time reduced the memory of data and coding the data. In the compression technology, the most important method is coding.

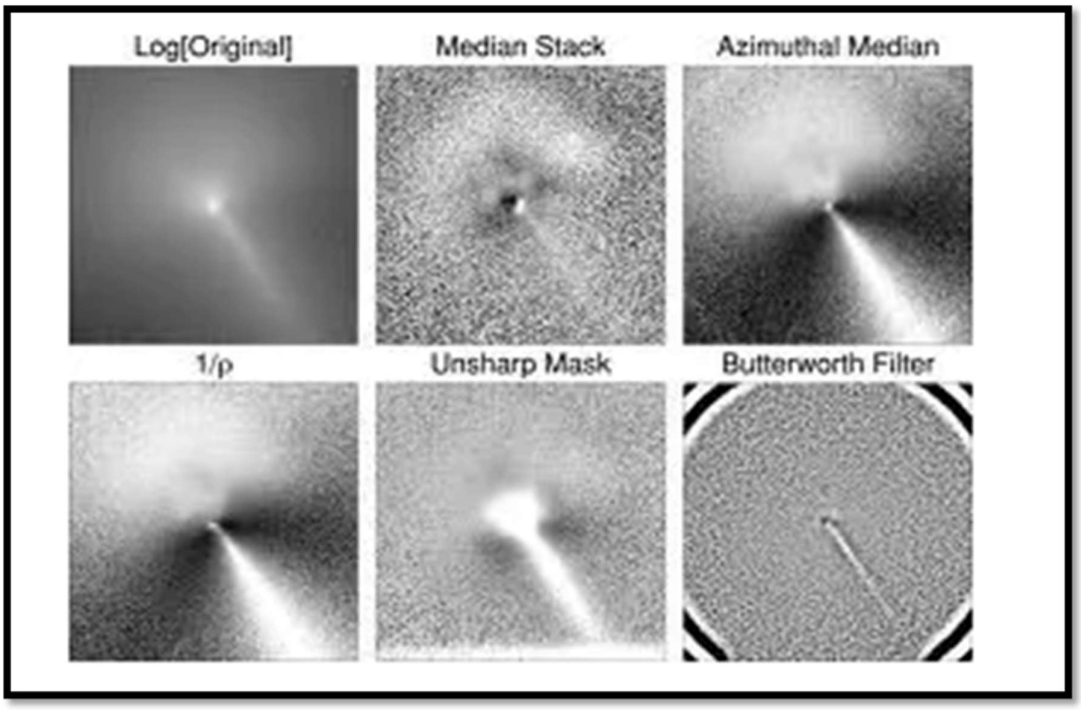

Figure 2 Pixel of image
(Source 4)

In the image processing data it is the earliest mature technology in the world [15]. Image transmission is the large processing of the spatial domain computation. Indirect processing of image is used to convert transform domain in the processing domain.

IV.TRANSFORNM THE IMAGE

In the digital image processing to use algorithm for transform the image. Transformation function is the map of the set of another step to performing the operation. In the introductory field, we have already seen the image processing of data. A system develops input and output image for processing in the image transformation. It gives a wonderful result of a image transmission. Figure in this digital system the image can apply and convert the image it is called the image transformation function [2].The main content of a image transmission is to classified the pattern reorganization.

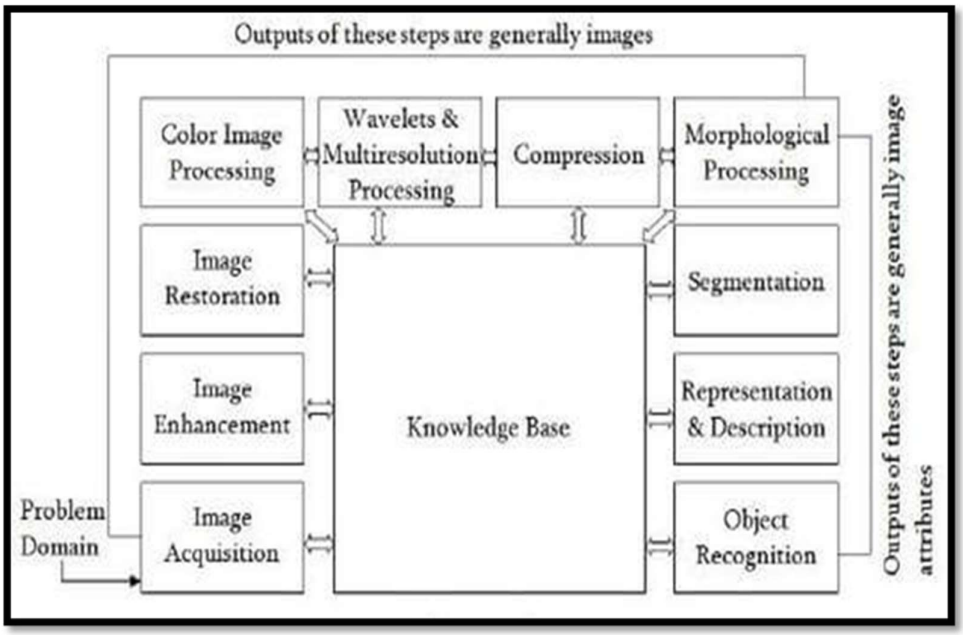

Figure 3: Outputs of the Images
(Source: 13)

Figure 3 is highlighted by the differed way out which helps to get information about output process. Some of the image feature extraction and segmentation of enhancement compression and restoration [11]. The image of method follows the classical pattern of an image. And recognize the classical statistical pattern. Structural pattern is one of the most common examples of image transform action. For two image subtraction and addition is use for subtract and adding image on the grey scale image. The grey scale image store the rectangle point of column in the transformation. In the image transformation for noisy image filter can be used.

V.EDIT AND RTETOUCHING THE IMAGE

For retouch the image to avoid the duplicate image since it is damaging the original layer of a image. Remove the image wrinkles for use the patch tools [12].To eliminates the image eye bags for use the clone stamp. Remove the blemishes of the picture to use the healing spot tool. For digital image the software use in various purpose to improve there overall presentation

[5].Photography is one of the best example for removing the noise of picture. Design the studio and painting faculty is also available in the retouch the photo. Image editing is the set of visual manipulation it is performed to improve there picture quality [8]. Colour correction resizing, shape adjusting are examples of image retouching and editing. It is the use of binary image and geometric characteristics describe the characteristics of the object. Surface description and volume description is the object description in this field. It is the three dimensional object description of digital image processing. It also used for a two dimensional object description in the digital image.

VI.IMAGE ENHANCEMENT

Digital Image has 3 types 1) binary image pixel image is 0 and 1.2) black and white image pixel quality is npisy.3)8 bit colour format has the 265 different colours of shades. It is known as grey scale image in the image enhancement[5].In this 8 bit colour format black stands for 0,white stands for 255 and grey stands for 127.4)16 bit colour format has the different colours it is known for high colour format. In the distribution of colour grey scale is not same as a high colour format.16 bit format divided in the three formats such as red, green, and blue. This is why 16 bit colour format is the RGB format. Image enhancement featured is the obscured and highlight the image [5].It is the changing the colour and brightness of the picture. Image enhancement deals with an image restoration for improving the appurtenance of the image.

$$f(x,y) = \begin{bmatrix} f(0,0) & f(0,1) & f(0,2) & \dots & f(0,N-1) \\ f(1,0) & f(1,1) & f(1,2) & \dots & f(1,N-1) \\ . & . & . & & . \\ . & . & . & & . \\ . & . & . & & . \\ f(M-1,0) & f(M-1,1) & f(M-1,2) & \dots & f(M-1,N-1) \end{bmatrix}$$

Figure 4: Calculation of Image Enhancement
(Source: 15)

It is based on mathematical and probabilistic concept for image enhancement. Degradation of image is the one of the best example for image enhancement [9]. Colour image is important because it is gaining the significant of digital image. Digital image increase the colour of image processing in the image enhancement. Colour processing and modelling processing in the digital image for image of enhancement. In this other hand image enhancement is the subjective way in digital data processing.

VII. SHARPING AND RESTORATION OF IMAGE

Image sharping is the way of highlighting in the digital data process and enhances the fine details of picture. In the photographic and printing industry sharping of image is widely used in the world. In this industry increasing the image contrast and sharpening. Rise distance is the main instrument of the image sharpening for measure the edge of the image [10].In this

techniques measurement pixel level between 10% to 30% of the sharping the image. It is determine to pixel of image in the digital data process system. Interpolation and anti-aliasing filters are use to overcome the image. This is why it is the digital image to sharpening the all filters.

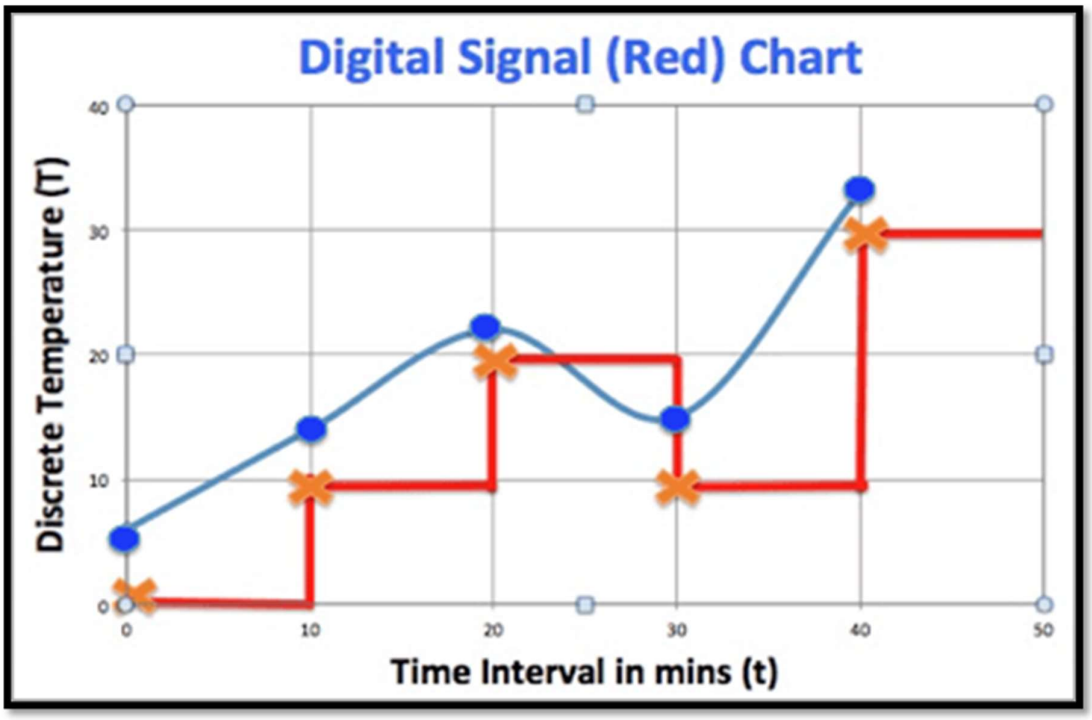

Figure 6: Digital Signal Chart
(Source: 14)

Figure 6 is based on the digital signal chart which helps to analyse the creative effect is to need the additional sharpening for image sharpening. Image restoration is one of the correct and noisy image instruments [12].It is the clear and clean image for restoration and it is the best way for digital data processing. Restoration attempts and reconstruct the process of mage in the restoration [15].It is the prior knowledge of the recover and degraded image in the restoration image.

In the digital image processing there are many types of restoration available such as inverse filter, constrained list filter, square filter, These are the methods of the restoration image but here some of the methods are either linear or non linear.

VII. USES OF THE MEDICAL FIELD

The most popular software programed is adobe Photoshop. Photo retouching is the final presentation of the digital data image. In the photo retouch there adjustment of the photo size is too small for retouching the photo. Airbrushing is the most common example of the retouch photo and editing the photo [2].In the new image photo fixing the pixels and brightness for retouching and editing the photo. In the digital processing two types are editing are available such as line editing and copy editing [9].Various methods are available in the photo editing, such as mechanical editing, substantive editing, and developmental editing. Creative effect is

to need the additional sharpening for image sharpening. Image restoration is one of the correct and noisy image instruments.

It is the clear and clean image for restoration and it is the best way for digital data processing. Restoration attempts and reconstruct the process of mage in the restoration [5].It is the prior knowledge of the recover and degraded image in the restoration image. In the digital image processing there are many types of restoration available such as inverse filter, constrained list filter, square filter, These are the methods of the restoration image but here some of the methods are either linear or non linear. This is why it is helps to blur and noise from the image.

IX. PROBLEM STATMENT

Researchers unable to collect statistical information, as data collection process are based on secondary methods. This is why it is helps to blur and noise from the image. Image sharping is the way of highlighting in the digital data process and enhance the fine details of picture[15].In the photographic and printing industry sharping of image is widely used in the world. In this industry increasing the image contrast and sharpening. Rise distance is the main instrument of the image sharpening for measure the edge of the image. It is determine to pixel of image in the digital data process system [5].Interpolation and anti-aliasing filters are use to overcome the image. This is why it is the digital image to sharpening the all filters.

CONCLUSION

It is not only less the computation of amount but use for always imaging processing. Image understanding and recognition is the prerequisite for image description. The filter can use in the arithmetical image for clear the noisy image. For the brightness of an image grey scale is used for to change the colour into black and white. The picture is the gradient level from black to white.

REFERENCES

[1] Banham, M. R., & Katsaggelos, A. K. (1997). Digital image restoration. IEEE signal processing magazine, 14(2), 24-41. Retrieved from: https://search.iczhiku.com/paper/dUHcahcZtC6ympTD.pdf [Retrieved on: 24/03/2023]

[2] Chen, L. G., Chen, W. T., Jehng, Y. S., & Chuch, C. T. (1991, June). An efficient parallel motion estimation algorithm for digital image processing. In 1991 IEEE International Symposium on Circuits and Systems (ISCAS) (pp. 670-673). IEEE. Retrieved from: https://scholars.lib.ntu.edu.tw/bitstream/123456789/150994/1/00176423.pdf [Retrieved on: 24/03/2023]

[3] Huang, H., Guo, W., & Zhang, Y. (2008, December). Detection of copy-move forgery in digital images using SIFT algorithm. In 2008 IEEE Pacific-Asia Workshop on Computational Intelligence and Industrial Application (Vol. 2, pp. 272-276). IEEE. Retrieved from: https://www.academia.edu/download/55620260/durga.pdf [Retrieved on: 24/03/2023]

[4] Joo, S., Moon, W. K., & Kim, H. C. (2004, September). Computer-aided diagnosis of solid breast nodules on ultrasound with digital image processing and artificial neural network. In The 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (Vol. 1, pp. 1397-1400). IEEE. Retrieved from: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=ebddf323f230c5ffb43b2a47e74eeeb0d79abdb3[Retrieved on: 24/03/2023]

[5] Joo, S., Moon, W. K., & Kim, H. C. (2004, September). Computer-aided diagnosis of solid breast nodules on ultrasound with digital image processing and artificial neural network. In The 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (Vol. 1, pp. 1397-1400). IEEE. Retrieved from: https://www.researchgate.net/profile/Segyeong-Joo/publication/6532642_Computer-aided_diagnosis_of_solid_breast_nodules_on_ultrasound_with_digital_image_processing_and_artificial_neural_network/links/0deec524e4ecfafd04000000/Computer-aided-diagnosis-of-solid-breast-nodules-on-ultrasound-with-digital-image-processing-and-artificial-neural-network.pdf [Retrieved on: 24/03/2023]

[6] Langelaar, G. C., Setyawan, I., & Lagendijk, R. L. (2000). Watermarking digital image and video data. A state-of-the-art overview. IEEE Signal processing magazine, 17(5), 20-46. Retrieved from: https://core.ac.uk/download/pdf/192346763.pdf [Retrieved on: 24/03/2023]

[7] Lee, J. S. (1980). Digital image enhancement and noise filtering by use of local statistics. IEEE transactions on pattern analysis and machine intelligence, (2), 165-168. Retrieved from: https://asset-pdf.scinapse.io/prod/2104763670/2104763670.pdf [Retrieved on: 24/03/2023]

[8] Li, J., & Wang, J. Z. (2004). Studying digital imagery of ancient paintings by mixtures of stochastic models. IEEE transactions on image processing, 13(3), 340-353. Retrieved from: http://infolab.stanford.edu/~wangz/project/imsearch/ART/TIP03/01278358.pdf [Retrieved on: 24/03/2023]

[9] Li, P., Lilja, D. J., Qian, W., Bazargan, K., & Riedel, M. D. (2013). Computation on stochastic bit streams digital image processing case studies. IEEE Transactions on Very Large Scale Integration (VLSI) Systems, 22(3), 449-462. C https://www.researchgate.net/profile/Weikang-Qian/publication/290178201_Case_Studies_of_Logical_Computation_on_Stochastic_Bit_Streams/links/5717509d08aeb56278c3884b/Case-Studies-of-Logical-Computation-on-Stochastic-Bit-Streams.pdf [Retrieved on: 24/03/2023]

[10] Liao, W., Huang, X., Van Coillie, F., Gautama, S., Pižurica, A., Philips, W., ... & Tuia, D. (2015). Processing of multiresolution thermal hyperspectral and digital color data: Outcome of the 2014 IEEE GRSS data fusion contest. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 8(6), 2984-2996. Retrieved from: https://ieeexplore.ieee.org/iel7/4609443/7175093/07109121.pdf [Retrieved on: 24/03/2023]

[11] Pitas, I. (1996, September). A method for signature casting on digital images. In Proceedings of 3rd IEEE International Conference on Image Processing (Vol. 3, pp. 215-218). IEEE. Retrieved from: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=23f78d580aa4b1a87a495c7604c0d32f727f2fad [Retrieved on: 24/03/2023]

[12] Pitas, I., & Venetsanopoulos, A. N. (1992). Order statistics in digital image processing. Proceedings of the IEEE, 80(12), 1893-1921. Retrieved from: http://web.eecs.utk.edu/~hqi/ece472-572/reference/order-statistics.pdf [Retrieved on: 24/03/2023]

[13] Voyatzis, G., & Pitas, I. (1999). Protecting digital image copyrights: a framework. IEEE Computer Graphics and Applications, 19(1), 18-24. Retrieved from:

https://scholar.archive.org/work/p6jv3qoo3nda5adidk54xk7xhu/access/wayback/http://come.ssu.ac.kr:80/~ieee/cga/cg1999/pdf/g1018.pdf [Retrieved on: 24/03/2023]

[14] Ye, S., Sun, Q., & Chang, E. C. (2007, July). Detecting digital image forgeries by measuring inconsistencies of blocking artifact. In 2007 IEEE International Conference on Multimedia and Expo (pp. 12-15). Ieee. Retrieved from: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=ebddf323f230c5ffb43b2a47e74eeeb0d79abdb3 [Retrieved on: 24/03/2023]

[15] Zeng, W., & Liu, B. (1999). A statistical watermark detection technique without using original images for resolving rightful ownerships of digital images. IEEE Transactions on Image Processing, 8(11), 1534-1548. Retrieved from: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=453ffd2851e3d7a7a842545d117b1cb88980349e [Retrieved on: 24/03/2023]