

Informative Images for Information and Communication Using Brightness, Contrast and Picture Effect

Lianly Rompis

Universitas Katolik De La Salle, Manado 95253, Indonesia

Email: lrompis@unikadelasalle.ac.id

Abstract—Sometimes information needs to be interactive and informative for people to be able to understand and catch the meaning or comprehension of it which is written in booklets, course materials or topics discussed through social media or classroom. Portion of multimedia elements that make information so valuable and accepted by students or a society is the one we called image, an important element that mainly acts as a communication line for transferring information. For better conveying, users or students usually change and modify an original image into a good quality image through image processing. Even in Electrical Engineering field image takes an important role because it used to represent a device, network, tool, component or system in brief description. A good and informative image facilitates the development of knowledge, clear information and supple communication. The idea is about informative image that merely focuses on parts of an image that need to be emphasized and showed to the audiences. This paper is conducted a research to create an informative image using three features: brightness, contrast, and picture effect. The research methodology is literature study, practice experience, and image processing method. The output gives a positive outcome and could help people to improve their skills in designing or editing a new excellent apparent of image for the purpose of information and communication.

Index Terms—communicative information, 3D image, image processing, image communication, live presentation, virtual reality

I. INTRODUCTION

Image is one of the multimedia elements. Together with text, sound, animation, video and link, it creates a useful presentation for communication, especially transferring or sharing information through social media, office, or classroom. It is necessary and exciting to get more involved with images and conduct image processing whenever we want to emphasis on something or deliver the main points of information in those pictures. In last two decades these matters are not so difficult to accomplish with the help of digital camera, mobile application, and computer software. Using these tools, a new image with a desired brightness and contrast can be created for more fancy-look [1]-[3]. However, people

sometimes find difficulty to express their thoughts through images and need more extra time to design the good quality ones for information and communication. Due to this problem, mostly people just keep maintaining using the default original images. A designer exists to solve the problem to help people with their creative skills on manipulating and modifying pictures or images but generally they modify it as a whole image according to level of exposure and standard editing.

This paper explains about a research which has already conducted in relation to image processing for constructing informative images. It suggests method that gains skill to combine brightness, contrast, and picture effect for performing a new good looking image which does not point the body of picture as whole but only scopes in one or two parts of it that considered important and necessary to highlight those for information and communication satisfaction and urgency.

II. RESEARCH METHODOLOGY

For this research, author conducted several procedures: literature study, practice experience, and image processing method. The output concludes a procedure on how to help people creating informative images with different looks and perspectives for improving delivery of information and successful communication.

III. LITERATURE STUDY

Many researches have been done related to image processing. The current trend research is about 3D Image and Virtual Reality. The reason why we are dealing with 3D and Virtual Reality is the requirement of real image for better viewing and understanding of the message inside it. With perfect techniques and smoothing method, we could derive 2D and 3D images that informative for audiences which give brief explanation and arouse imagination [4]-[6].

An informative image was created in this research using three features: brightness, contrast, and picture effect. These features were considered common in image processing and easy to learn. Other important features did not take into account and would be considered for advance research in the future.

A. Brightness

Pixel intensity brightness adjustment is the easiest pixel operation. The brightness level of an image can be seen by its histogram as given in Fig. 1. All pixels usually concentrated at one side of histogram with specific range of gray level. When we increase the brightness level of an image, the concentration of pixel value will shift to the right side. If we decrease the brightness level then the pixel concentration will shift to the left [7]-[9]. An image with brightness adjustment is shown in Fig. 2.

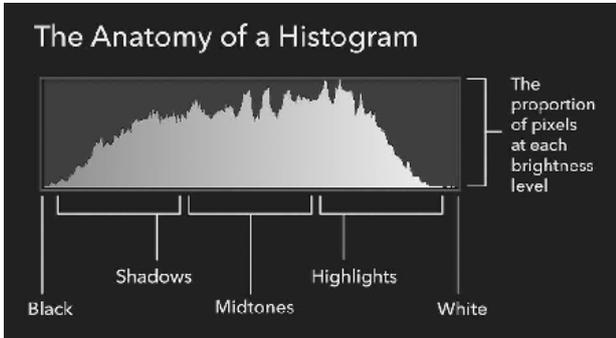


Figure 1. Brightness level histogram (Source: researchgate.net).



Figure 2. Image with brightness adjustment.

B. Contrast Stretching



Figure 3. Low contrast and high contrast histogram.



Figure 4. Image with contrast stretching.

Contrast of an image is a distribution of light and dark pixel. Gray scale image with low contrast will look too dark, too light, or too gray. The histogram of low contrast image will show the concentration of all pixels at the left side, right side, or the center. A high contrast image has a wide dark and light area as shown in Fig. 3. A good contrast image will show a wide range of pixel. The

histogram uniformly distributed, does not have maximum or minimum peak. Contrast stretching is a simple technique that could be used to repair the contrast of an image especially low contrast image. This technique works well with image that has Gaussian distribution [4], [9]. An image with contrast stretching is shown in Fig. 4.

C. Picture Effect

Picture Effect is a feature that polishes an image and gives effects with shadow, reflection, glow, and soft edge. This will help a lot in finishing the result with good blending so we could have a perfect image as we wish [7], [9]. Several picture effects carried out on image are described in Fig. 5.



Figure 5. Image with picture effects.

IV. ANALYSIS AND OBSERVATION

A. Analysis

From the above discussion and based on author practice experience, three features were combined to perform image processing together with image editing techniques and easily create an informative image: brightness, contrast and picture effect.

B. Observation

The method used for image processing was selecting the part of the original image that we want to emphasize, ‘glow up’, or ‘pop up’ and did the right cropping, adjustment, stretching and blending. For example we need to present information about lotus flower. In relation to this the parts of lotus flower will be highlighted or ‘popped up’ so it will be easy for the audience to get the main point of the presentation.

Another example, if we want to discuss or communicate about new computer device to employers and think that the parts of that device should be emphasized, then we can create an informative image for this kind of requirement.

The first step in research was selecting the part of the image that need to be glow up and then cropped the rest of an image that does not important to be informed. A piece of image that in line with the topic was picked up considerably so people will have more attention on that part of the information that we want to show through the image. However a group of images can be selected if it is considered important.

If the image needs special crop, then do it slowly and neatly. An example of the original and cropped image is given in Fig. 6 and Fig. 7.



Figure 6. Original image (Source: alamendah.org).



Figure 7. Cropped image.

The next step was important because it applied one or several adjustments or stretching on cropped image by setting the proper brightness and contrast value like the images described in Fig. 8. Perfect brightness, contrast and picture effect made the image more interactive and informative, interesting to see the highlights and the way they bring a presentation into live and attract people attention to be more focus on the topics [4], [6], [10].



Figure 8. Image with brightness and contrast 20% and 40%.

After doing adjustments and stretchings, picture effect were added for the process of blending, smoothing and clearness of the image. The final step would be the

finishing skill to attach the edited image with the original image so both will be perfectly integrated as one as shown in Fig. 9 to Fig. 11.



Figure 9. Specific applied features on image.



Figure 10. Flower image that looks appealing (Source of original image: microsoft).



Figure 11. Showing the pureness of water (Source of original image: unsplash.com).

Performing an informative image into 3D forms is more catchy and delightful as can be seen in Fig. 12. 3D picture effect should be applied correctly into the step of image processing in order to get the wonderful embossed picture. This is almost like creating real images with virtual reality but in here we are using general tools and software that mostly familiar with users.



Figure 12. Embossed images with attracting colors and brightness.

Let the pictures or images talk and express the meaningful messages [5] like the information given in

Fig. 13. Using camera and proper perspective, the images look alive and more beautiful. An image designer or multimedia designer surely can polish these images and make them more attractive.



Figure 13. Images that emphasize 3D images with attracting colors and brightness (Source of original images: fullhdwall.com and pngdownload.id).

V. CONCLUSIONS

The research aims to encourage people to liven up their presentation on important topics or main ideas with the support of image processing tools. Informative images more interactive and catchy beside optimizing multimedia techniques and skills from students, designers and scientists.

Many software and applications can be found nowadays related to digital image adjustments using brightness, contrast and picture effect. All the images in this research mainly can be created using Microsoft Word that already familiar for users from all ages and turned into high quality images using Adobe Photoshop and other image processing tools.

This research outcome also suggests a development of image processing software for future works that easily will help users to emboss or pop-up or magnify the chunks or 'puzzles' of an image for improving the quality of information and communication for presentation in education, expo, game, studio, museum, picture gallery, global positioning system, and even in signal processing

that has many signals and parts to be analyzed. A new job can be built from here and probably could complement the virtual reality technology that already exist.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGMENT

I thank my family for the inspirations of these wonderful creations and my friends for the motivations in learning.

REFERENCES

- [1] A. Watt and F. Policarpo, *The Computer Image*, England: Addison Wesley Longman, 1999.
- [2] D. Putra, *Pengolahan Citra Digital*, Yogyakarta: Penerbit ANDI, 2010.
- [3] U. Ahmad, *Pengolahan Citra Digital dan Teknik Pemrogramannya*, Yogyakarta: Penerbit Graha Ilmu, 2005.
- [4] R. E. Wendt. (1994). Automatic adjustment of contrast and brightness of magnetic resonance images. *Journal of Digital Imaging* [Online]. 7(2). pp. 95-97. Available: <https://doi.org/10.1007/BF03168430>
- [5] S. M. Laluraa, *Aplikasi Edutainment Ikan di Taman Laut Bunaken Berbasis Virtual Reality*, Manado: Universitas Katolik De La Salle, 2016.
- [6] Y. Komalig, *Image Smoothing Menggunakan Gaussian Filter*, Manado: Universitas Katolik De La Salle, 2019.
- [7] J. J. Parsons, *New Perspectives on Computer Concepts 2016, Introductory*, 1st ed., USA: Cengage Learning, 2016, pp. 2-367.
- [8] D. Cromey, *Image Processing using the Histogram Tool*, Arizona: The University of Arizona, 2017, pp. 1-3.
- [9] W. Burger and M. J. Burge, *Digital Image Processing*, London: Springer, 2008, ch. 4. pp. 37-52.
- [10] D. P. Curtin. (2011). Digital desktop studio photography: The complete guide to lighting and photographing small objects with your digital camera. [Online]. Available: <http://www.shortcourses.com/tabletop/index.html>

Copyright © 2020 by the authors. This is an open access article distributed under the Creative Commons Attribution License ([CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)), which permits use, distribution and reproduction in any medium, provided that the article is properly cited, the use is non-commercial and no modifications or adaptations are made.



Lianly Rompis is a Senior Lecturer in Electrical Engineering Study Program, Faculty of Engineering Universitas Katolik De La Salle Manado-Indonesia. Her interest focuses on Electronics and Digital Technology. She has conducted several researches related to Digital System and Information Technology Services. She holds a Bachelor of Electrical Engineering from Universitas Sam Ratulangi Manado-Indonesia and received her Master of Information Technology Studies from University of Wollongong, Australia. She has published over 35 articles in conferences and journals. She is currently a Staff in Research Department of her university.