Detecting Cardiac Arrest Based on Image Processing

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Abstract. In the world, about 21 percent of death occurs in the age group of 28-72 years because of a cardiac arrest. Many people among us lose their life because of heart-attack. After the occurrence of heart-attack only, the patient can be monitored. To help our society from heart-attack, I am developing a system that helps to decrease the death rate and early detection of a heart attack. Thus, this system is used to save the life of many people. We detect the prior occurrence of heart-attack of a patient using their monitored lungs datasets using image processing along with IoT.

Keywords: image restoration, Support Vector Machine, Grayscale conversion, segmentation, Histogram, Haar wavelet transform, median filtering.

1. Introduction

An image is a matrix of square pixels arranged in rows and columns. Image processing is a part of the electro domain wherein the image is converted into a matrix of small values, called pixels. Image enhancement is the improvement of the digital quality image without having the knowledge of the source degradation. If the source degradation is known, it is called as image restoration [¹]. Pixels transform into inches throughout is called resolution. The number of pixels per square inch in a computer [²]. The histogram points the number of pixels in the updated image of a vertical axis with a particular brightness of the horizontal axis.

Fig 1. Input image
To differentiate between black and white levels in images, on a flat panel display or a projection screen, I used contrast. Without good contrast, images appear to lack colour, brightness. The difference between the luminance of the white part of an image divided by the black part is known as image contrast ratio. Once the image is brought to good condition, the measurement extraction operations are used to obtain useful information from the image. Image enhancement is the improvement quality digital image [3].

Digital data compressions – to reduce the file sizes we use many image file formats to save memory or storage.

2. Existing System

First, we have to give input image, the input to the system are dermoscopic images which are taken by dermoscope. It is a type of magnifier used to take pictures of cardiac lesions. It is a handheld instrument make it easier to diagnose cardiac arrest pre-processing. Image pre-processing involves of three types: 1) Noise removal, 2) Grayscale conversion, 3) Image enhancement [4,5]. Noise tends to less clarity when pictures are taken in low light settings. A picture with invade image can be given an effect antiqued by adding monochrome noise. Removing these distracting noises improves overall composition [6,7]. SVM’s are supervised learning with associated learning algorithm used for classification and regression analysis.

3. Proposed System

In order to improve the result of feature extraction, I used eight different algorithms were used. The pre-processing algorithms used were converting greyscale image, sharpening filter, smooth filter, median filter, binary mask, RGB extraction and histogram, and operator. These algorithms used are collect the database and find out the person is with a cardiac arrest or normal. To segmentation through K means clustering method is used. SVM’s are supervised learning with associated learning algorithms used for regression and classification analysis. Tuberculosis – Is one of the most infectious disease in the World caused by bacterium. It generally affects the lungs and also other parts of the body. One-fifth of the world’s population is thought to be infected with tuberculosis. From ancient times, tuberculosis was found in humans. About 90 percent of cases who are affected with tuberculosis are found to be infected in lungs. When compared to lower part of lungs, higher part has more chances to occur tuberculosis.
Fig 3. Chest X ray with advanced tuberculosis

Fig 4. Block diagram

4. Flow Diagram Description

First, the input image is selected for the identification of brain tuberculosis that affects lung images. The selected may have some noise so the image is filtered by using the filter that removes the salt and pepper noises in the image. The filtered image is then segmented and then using OTSU’s thresholding energy which segments the lung part of the X-ray. Then the features of the image are extracted by using the Haar wavelet transform and histogram. Finally, the features of the input images are compared with the
training datasets using support vector machines. The trained datasets contain images of affected and normal lung images. The result will be shown that tuberculosis was affected or not.

5. Results

Tuberculosis might infect any part of the body but commonly occurs in the lungs known as pulmonary tuberculosis. Extra pulmonary occurs when tuberculosis occurs inside the lungs. General symptoms are fever, chills, weight loss, nail clubbing may also occur. Results of the images shows the infected region of the lungs and person is affected with a specific disease provided to images.

![Symptoms of Tuberculosis](image_url)

Fig 5. Symptoms of Tuberculosis

6. CONCLUSION

Pulmonary tuberculosis persists as a big health problem in Korea. Increase in the overall age of the population and the rise of drug resistant. Finally, extracted features are compared with trained datasets using SVM and the result will be shown whether then tuberculosis is affected or not. All the above process is done and implemented the images and results using support vector machines.

References

[1] A. Dawoud, “Lung segmentation in chest radiographs by fusing shape information in iterative thresholding”, IET Comput. Vis., vol. 5, no. 3, pp. 185-190, 2013.

[2] Hrudya Dasl, Ajay Nath,”An Efficient Detection of Tuberculosis from Chest X-rays “, international Journal of Advance Research in Computer Science and Management Studies”, Volume 3, Issue 5, May 2015 pg.149-154.

[3] Viji Amutha Mary A, A Random Projection Approach to Strengthen the Privacy Level of
Medical Images, Journal of Computational and Theoretical Nanoscience, vol. 16, issue 8, August 2019, pp. 3219-3221.

[4] A.M. Khan, Ravi. S,” Image Segmentation Methods: Comparative Study”, International Journal of Soft Computing and Engineering (USCE) ISSN:2231-2307, Volume-3, Issue-4, September 2013.

[5] Wai Yan Nyein Naing, Zaw Z. htike, “Advances in automatic tuberculosis detection in chest X-ray images”, signal & image 802 processing an international Journal (sipij) vol.5, no.6, December 2014.

[6] Tao Xu, Irene Cheng, Senior Member IEEE, and Mrinal Mandai, Senior Member, IEEE, “Automated Cavity Detection of Infectious Pulmonary Tuberculosis in Chest Radiographs”, 33rd Annual international Conference of the IEEE EMBS Boston USA, August 30-September 3, 2011.

[7] Jayachandar, Franjoe Morais B, Viji Amutha Mary A, “An Efficient Approach to Secure Personal Health Record”, GJPAM, Vol 13, No6, 2017.