

Blood Group Identification Using Machine Learning- A Review of Literature

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ABSTRACT

Abstract- Recognizing the blood group is very important in medical emergency cases. The method based on image processing and machine learning technology at present are very fast and it has widely used in the medical field. In this system, we are proposing the more accurate and fast recognition of human blood group based on computer vision and machine learning technology. Sometimes the human eye may give us an inaccurate result, but if we detect the blood group using computer vision with machine learning technology then the small error in the results which are calculated and given by humans is eliminated. Using computer vision technology, we can give the best result as this technology is growing faster and faster. This technique can quickly and accurately identify the blood group.

Keywords— Machine Learning, Threshold Segmentation, Histogram, HSV, Binary image, computer Vision.

I. INTRODUCTION

Identification of blood groups is essential to make sure that transfusion is safe. Blood group typing is more important before the transfusion of blood, blood donation, and road disasters, and other urgent situations. During emergencies, a quick examination of the blood group typing is essential, which is openly associated with the survival of the patient. Due to advancements in image processing technology, automatic systems to identify blood group has become a vital requirement in the medical field. The categorization of human blood is done based on the availability of the protein molecules named, antigens and antibodies. The antigen is the unrevealed body that causes a response to the human immune system either individually or by forming a multifaceted huge protein arrangement. Antibodies are protein substances that are formed by the immune system to fight not in favor of the unknown body which may cause impairment to our body. The main motive of this prototype is to build a system to categorize different blood groups and in a very short span of time with high accuracy. This system helps in reducing human errors and the reactions caused by the blood transfusion due to errors are also reduced. This system uses an image processing technique that uses python programming.

An ABO incompatibility reaction can occur if you receive the wrong type of blood during a blood transfusion. It's a rare but serious and potentially fatal response to incompatible blood by your immune system. Human error is the most likely cause of an ABO incompatibility reaction. If your transfusion uses the wrong blood type, it could be the result of unlabeled blood, incorrectly completed forms, or a failure to check donated blood before the transfusion. There is a scope for determining blood types using computer vision techniques. Image segmentation algorithm for blood type classification and various computer vision parameters are analyzed image quantification such as mean value, variance, variance, etc. The slide test consists of the mixture of one drop of blood and one drop of reagent, being the result interpreted according to the occurrence or not of agglutination. The combination of the occurrence and nonoccurrence of the agglutination determines the blood type of the patient. Thus, the Application developed in computer vision techniques allows, through an image captured after the procedure of the slide test recognize the occurrence of agglutination and consequently the human blood type of the patient. by using the raspberry pi we can show the result on LCD.

II. OBJECTIVES OF PROJECT

- To improve the accuracy of human blood group determination and classification of blood type using image processing.
- To reduce the time required for blood group detection.
- To send notification automatically to the donor when there is a shortage of any blood group.

III. LITERATURE SURVEY

Mehedi Talukder, Md Rabiul Islam, etc. all in the year October 2015 on “Improvement of accuracy of human blood groups.”[1] He has suggested that, the human blood group can be identified by using computer vision using the plate method. This method gives the accurate result.

Pravin manikandan, Ravindra G, etc. all in year February 2017 on “Detection and classification of blood type using computer vision techniques.”[2] He has suggested that, the type of human blood group can be identified by using image processing with method such as thresholding, morphological processing, quantification, etc. It is powerful and efficient method to detect the agglutination and determines the blood type of the patient accurately.

Yue fang doing, etc. all in year 2017 on “ABO blood group identification based on image processing technology.”[3] He has suggested that, the blood group can be detected by using image processing with method such as measurement of linear primitives and circular primitives, color information extraction, object segmentation based on niblack, feature extraction, etc. A fast, accurate and robust blood group judgment method is proposed for the rapid and accurate identification of blood type in the case of emergency transfusion.

IV. PROPOSED ARCHITECTURE

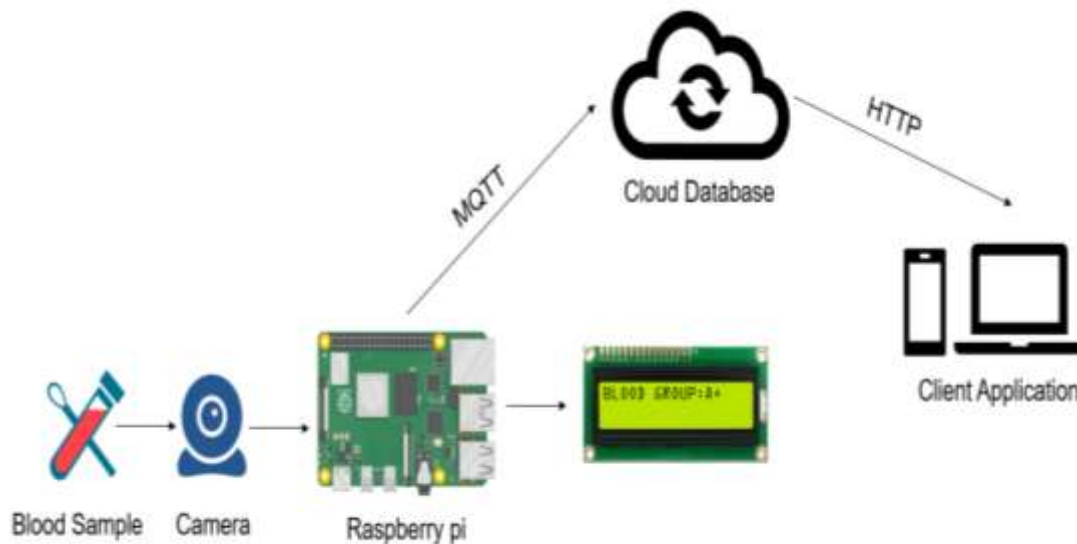


Figure 1 System Architecture

In our proposed system, reagents are mixed with three samples of blood. After some time, agglutination might possibly happen. After the formation of clumping, the slide is captured using the PiCam module and using raspberry pi-3B+ board, processing of the captured image is carried out such as morphology, thresholding, segmentation, quantification, etc. finally result is displayed on the LCD.

- a. **Pre-processing techniques**-In this system by adding the antinodes in the three-sample of blood. Then the stripe of blood sample is put under the camera and image is captured. this image is in RGB format we need to do some basic operation on the image so that we can get the better image so that this image can be process further .In Raspberry pi terminal we can capture the image with fix size format 1000*500p.The image is taken by the camera is stored and preprocess in Raspberry pi.
- b. **Thresholding**- It includes several capabilities for image processing. Contrast increase by static or dynamic binarization, lookup tables or image plane partition. Resolution reduction via binning.
- c. **Segmentation**-Segmentation is the process of extracting ROI (region of image) from the image. We need to extract the information form the image.
- d. **Morphological technique**-Morphology is a tool of extracting image components that are useful in the representation of region shape, such as edges, skeleton. In image morphological technique, there are two fundamental operations such as dilation and erosion, in terms of the union of an image with translated shape called a structuring element.

IV. CONCLUSION

A rapid, precise, and robust human blood group identification method is introduced for the fast and accurate identification of blood group in the case of emergency blood transfusion. Many experiments show that this method can quickly and precisely detect whether the serum and antibody agglutination reaction, and then get blood group type identification, to meet the emergency needs of automated rapid blood type detection.

V. REFERENCES

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