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AN AMELIORATED METHOD FOR EMPLOYING IMAGE PROCESSING TO IDENTIFY BLOOD GROUP

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Abstract: An blood group measurement method is in high demand worldwide, with developing nations having the greatest need for this kind of technology. Building this solution would be a good use for image processing, which is the most widely used device in both resource-rich and resource-poor places. A noninvasive method of measuring blood group is proposed in this project. In order to determine blood groups, it is also compared how different data collection locations,CNN,biosignal processing methods, theoretical underpinnings, photoplethysmogram (PPG) signal and features extraction procedures, image processing algorithms, and detection models vary. The results of this research were then utilized to suggest practical strategies for developing a noninvasive point-of-care tool for blood group assessment based on image processing.

***Index Terms* –Non invasive, biosignal processing, photoplethysmogram ,Image Processing.**

I. INTRODUCTION

One of the most prevalent and important requirements for many of the key healthcare applications is blood grouping. The use of humans, such as qualified medical personnel, in the traditional method of determining blood group almost always results in human error. Automating and digitizing this process is one way to get around this problem. Techniques from computer vision and image processing can be applied here. Thus, we use image processing approaches to study blood group detection. In order to achieve this, the experiment begins by obtaining color photographs as input, which are then used to identify blood groups. There is an urgent need for an inexpensive blood group measurement method worldwide, with a focus on developing nations. Blood group measurement using color image processing.

II. OBJECTIVE

This project aimed to predict blood groups using Image Processing algorithms for developing a noninvasive Blood Group estimation using a Image.

III. EXISTING SYSTEM

A blood diagnostic procedure called blood group level measurement counts the number of cells in the blood and their concentration. Blood Group is measured by clinicians in a number of ways. Though the most popular method is still the intrusive one (taking blood samples). Invasive procedures include adding different chemicals to a blood sample, and the Blood Group level is then determined by calculating optical fluctuations using spectroscopic data.

IV. LITERATURE REVIEW

B.K Aishwarya, Polishetti Abhinav [1] Blood Group Detection Using Deep Learning andImage Processing. It is believed that platelet division and counting represent important developments that help distinguish highlights for various disease studies. RBC guide counting in tiny photographs is a very difficult and time-consuming process. Planned research helps hematologist practitioners perform investigations more accurately and promptly. Finding one's blood type is a crucial first step in any treatment's healing process. A host of issues will arise from fake blood transfusions. This framework offers quick and easy methods to discreetly identify Rhesus components and blood category evidence. Our design is derived from real-world informative collections of several human fingertip character images. The presence or lack of specific natural materials called antibodies and received antigenic protein materials on the surfaces of erythrocytes within the body are used to categorize blood types.

Raj Bhagat1, Snehal Marge [2] Automatic Detection of Human Blood Group System using Deep Learning and Image Processing. In the current framework, blood gather finding is both moderate and imprecise. Human blood types are currently determined physically via slide tests. The following is the solution for the image processing techniques used to determine blood types: morphological operations, thresholding HSL luminance plane quantification, and preprocessing techniques. These techniques led to the creation of various prehandling systems, such as the use of dim and twofold transformations, shading plane extraction, and so on. The captured images should be of the same quality and size after preprocessing for handling.

Abubhakar Yamin [3] Detection of blood group in disaster or remote area where experts are unavailable is a challenging task to do. Three approaches are used in this method to identify blood group identification: picture capture, image pre-processing and segmentation, and blood group detection. obtaining images Blood samples combined with antiserum are placed on slides. To process the image further, it is loaded into a suggested system in MATLAB. Pre-processing: this involves adjusting the picture to fit into a particular format. Segmentation: We can simply crop the region of interest by utilizing the starting and ending coordinates of the region. Blood group detection: each segmented image's white pixel density is calculated to determine the blood group. The time it takes for the worker to take a picture under a microscope and subsequently determine the blood type is one of this method's drawbacks.

Sandip. D. Sahane [4] proposed a novel approach to provide an easy and fast means of identification of blood group using IR sensors. After passing through the blood sample, the light from the pulsating infrared LED is recognized, conditioned, and transformed into a voltage signal. To identify the blood type, the difference in the strength of the received signal caused by the absorption of blood for each blood group is converted into matching voltage changes. This method's drawback is that the sensation generated by the infrared sensors might not always be accurate. The inconsistency of color and contrast from different viewing angles is a disadvantage of employing LEDs.

Haihong lin [5] explains a novel approach to detect blood group using Raman spectroscopybased on Fourier transform .Raman spectroscopy in conjunction with PCA is used in this method to identify the sample and offer experimental data for blood identification and control. The PCA method is used to analyze the sample data and its quality attributes. The combination of Raman spectroscopy and stoichiometry analysis in PCA was unable to accurately discriminate A, B, and O samples because it exceeded the range of the Fourier transform value. This is one of the method's drawbacks. The authors describe a technique for identifying bridges and significant water crossings that can be seen in satellite photos.

V. METHODOLOGY

The implementation of image processing techniques has a huge impact on the tech organizations. Image processing systems play a crucial role in analysing and manipulating visual information from images. The architecture diagram describes the high-level overview of major system components and important working relationships.The architecture diagram is defined with the flow of the process which is used to refine theraw data and used for predicting the Blood Group data.Thenpreprocessing the collected raw data into an understandable format.Then we have to train the data by splitting the dataset into train data and test data.The Blood Group data is evaluated with the application of a image processing algorithm in the that is Color Image Processing, Detection Models, and the classification accuracy of this model.

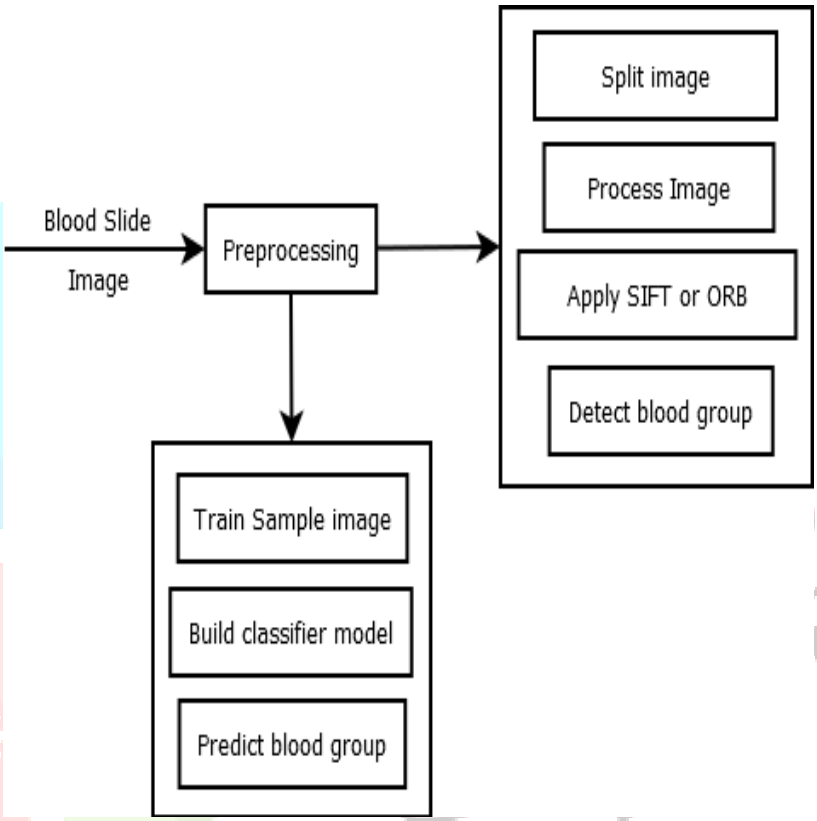

Fig: Architecture diagram

The identification of blood groups is crucial for both the purpose of donation and the subsequent classification of blood groups for in-depth research.TensorFlow and Keras are used in the image processing portion of this project, which is based on a neural network approach. The model uses a variety of layers, including dropout, dense, and sequential. An image classification probability is generated by this technique.All of the chosen images are subjected to the logic of image matching algorithms like SIFT and ORB in order to identify a blood group.

FLOW DIAGRAM

A data flow diagram (DFD) shows how information moves through a system or process. A blood group detection technology is applied to a picture of a blood slide. After that, the final blood group is identified by applying classification models and picture matching algorithms.The below represent the data flow diagram of blood group detection system.

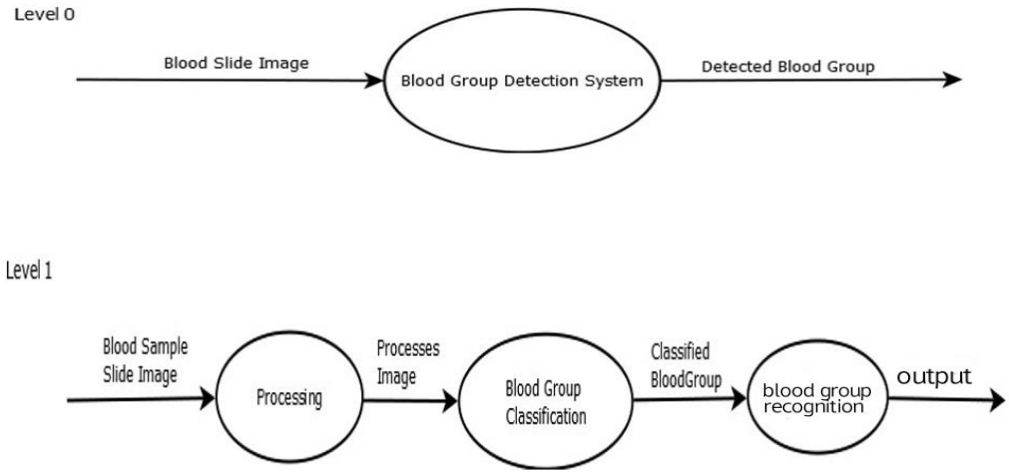

Fig: Flow diagram

Blood sample slide images are meticulously processed to classify blood groups. Initially, the images are prepared through preprocessing, enhancing clarity and removing noise. Segmentation isolates blood cells, vital for subsequent analysis. Features like cell shape and antigen presence are extracted, informing classification. Using advanced algorithms, such as neural networks, the blood group is determined. Finally, validation ensures accuracy, yielding a clear recognition output of the classified blood group.

VI. RESULTS AND DISCUSSION

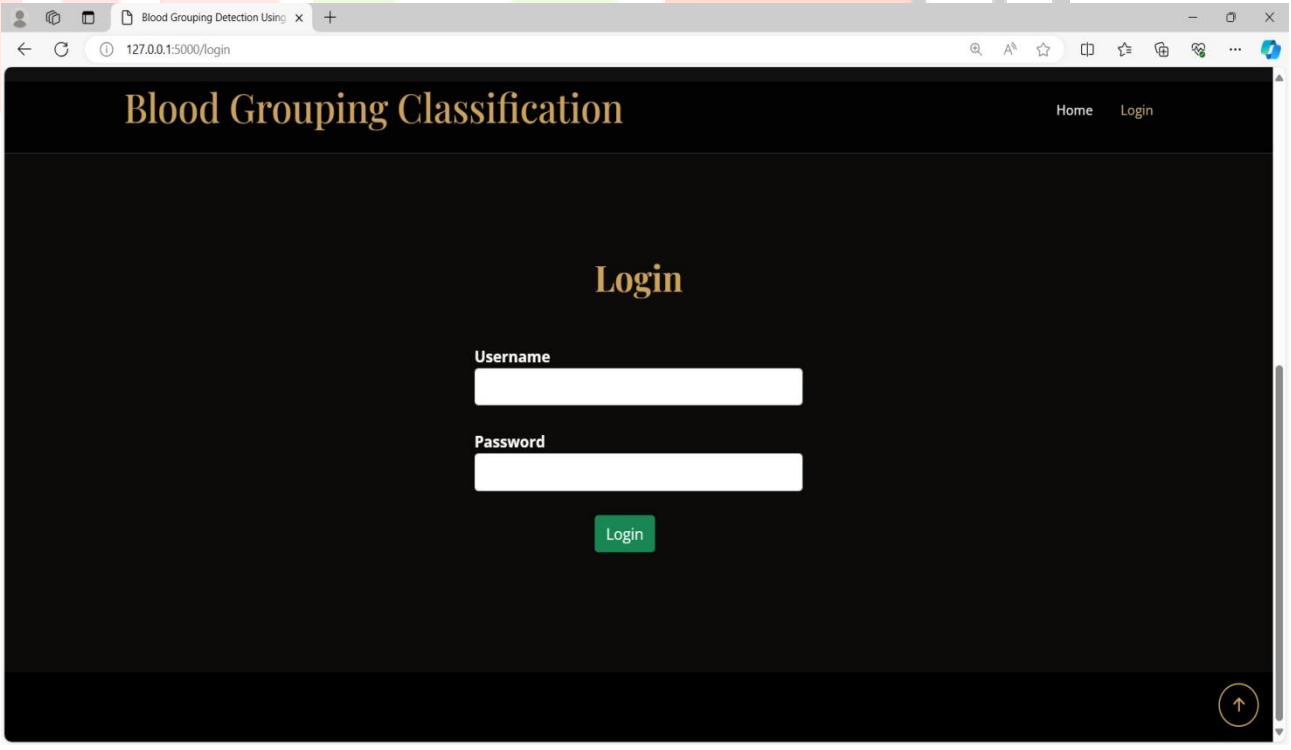

Fig: Login Page

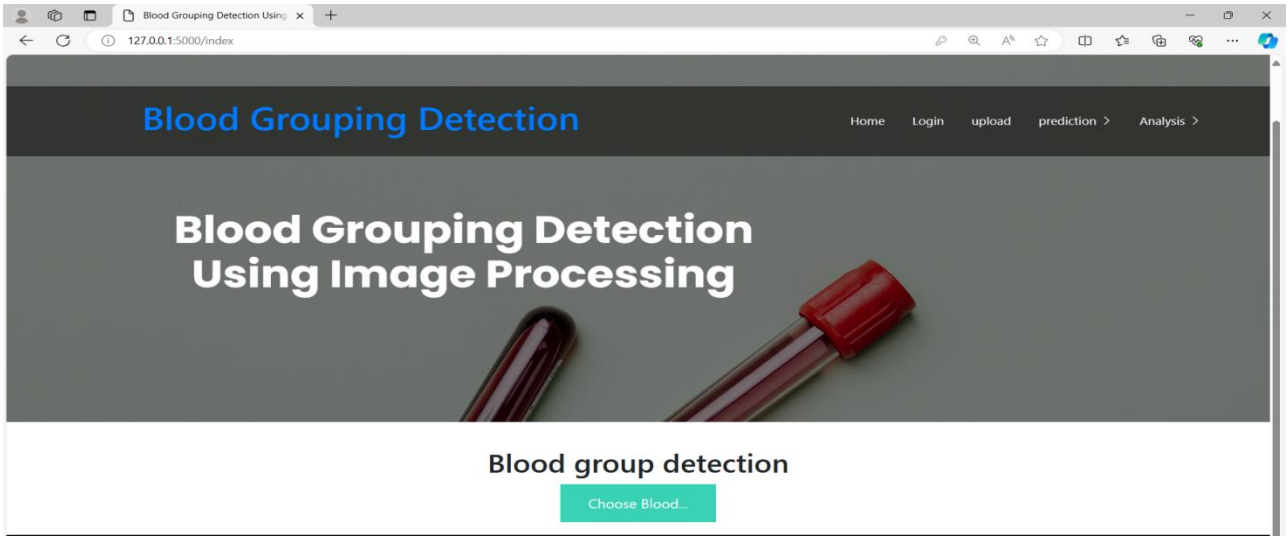

Fig: choosing the image

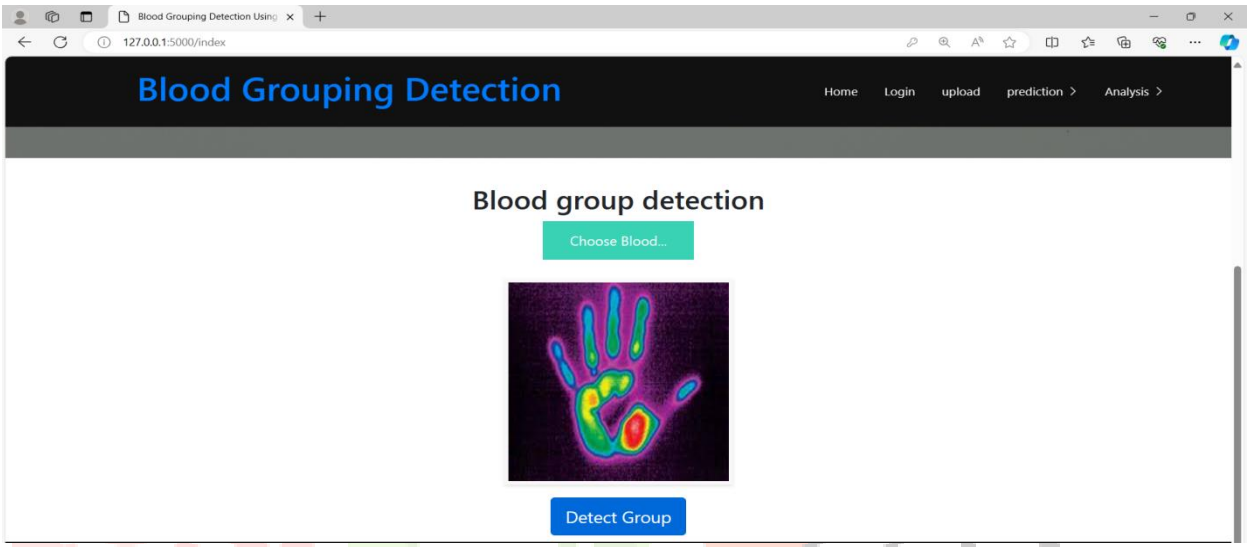

Fig: Insert the picture

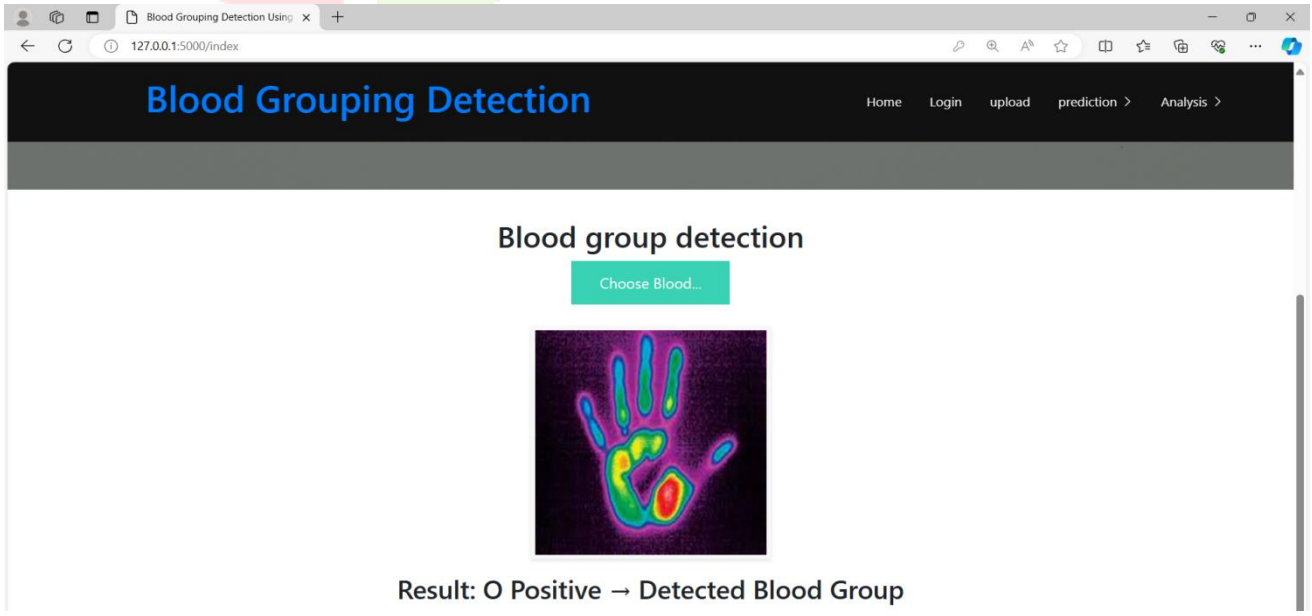

Fig: Predicting Results

First, login credentials are provided for blood group identification. Next, select an image and insert it to determine the blood group.The blood group is predicted and displayed on the screen.

VII. CONCLUSION

In this project, the blood type is determined quickly and accurately in an emergency before transfusion. Today, rapid blood typing methods based on image recognition technology are widely used in automated blood analyzers. This project proposes a fast, accurate, and robust blood group analysis method based on the imaging function of the ABO high-speed blood group analyzer. Then, according to the gray level distribution of the image, the characteristic parameters of the ABO blood group are extracted. With the agglutination reaction between the antigen and the antibody, the system ultimately determines the blood type. Experimental results show that this method can quickly and accurately classify ABO blood groups.

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