BLOOD GROUP IDENTIFICATION

Team 1

INTRODUCTION

The Blood Group Identification System is an online Django web application using OpenCV for effective detection of blood group based on image processing. Such a system makes it so much easier to identify through the much-needed aspect in emergencies and routine checkup processes. It's, thus, offering health care practitioners and patients the means to quickly and easily decide blood group status without long laboratory tests ensuring both time and informed decisions both in clinical practice and in personal life circumstances.

PROJECT OVERVIEW

CUSTOMER FEATURES

CREATE A new User Account to access the application.

LOGIN With your Username and Password.

UPLOAD An Image of ABD Blood Cells in Profile Page.

OUTPUT PAGE Will display a original image, processed image as well as type of blood group of ABD blood cells.

TECHNOLOGY USED

Frontend :-

- HTML/CSS: For designing the web page layout and the upload form.

Django Templates: To render dynamic content like the uploaded image, processed image, and blood type.

Backend :-

- Django Framework: Handles the request-response cycle, file uploads, and rendering results.
- Python Libraries:

1. OpenCV: For image processing.
2. NumPy: For numerical operations.
3. Base64: For encoding images in base64 format to display.

MILESTONE

1. The system allows users to sign up, log in, and verify their username with password along with security measures to protect user data.
Implement functionality for users to upload images of ABD blood cells to check their blood groups,
Database schema to store user information like username and password for authentication.

2. Using base64 encoding for image and detect contours in the processed image to identify and count significant elements for further analysis of blood group characteristics.

MILESTONE

3. Display the extracted contour count on the profile page, integrating it into the blood group identification process for reliability. Utilize OpenCV to preprocess blood slide images by converting them to grayscale, applying Gaussian blur, and performing binary thresholding , morphological operation to enhance features. Display the Processed image as well as original image on the profile page, integrating it into the blood group identification process for reliability.

4. Calculated a blood type using agglutination function. Display the predicted blood group type with image extracted from the preprocessed enhanced features of input image.

PROCESS WORKFLOW

1. Frontend Workflow:

- The user sees a webpage with a form to upload an ABD blood cell image and a "Check Blood Type" button.
- The user clicks on the upload field and selects an image from their computer.
- The selected image is prepared for sending to the backend in a format the server can understand.
- When the user clicks "Check Blood Type," the image is sent to the Django backend using a POST request.
- The Django backend processes the image and sends back the results.

PROCESS WORKFLOW

2. Backend Workflow:

- Accepts ABD blood cell image from the frontend via a POST request.
- Converts the uploaded file into a processable format using OpenCV.
- Applies grayscale conversion, Gaussian blur, and binary thresholding to enhance features.
- Divides the image into three regions (A, B, D) for analysis.
- Detects agglutination patterns in each region using connected components.
- Classifies blood type based on agglutination in the segmented regions.
- Encodes original and processed images along with the detected blood type.
- Returns results to the frontend for display.

PROCESS WORKFLOW

3. Output:

Once the image is processed, the webpage displays the following:

- Original Image: The uploaded ABD blood cell image for reference.
- Morphologically Processed Image: A cleaned and enhanced version showing key features extracted during analysis.
- Predicted Blood Type: The final result, indicating the blood group based on image analysis.

HOME PAGE

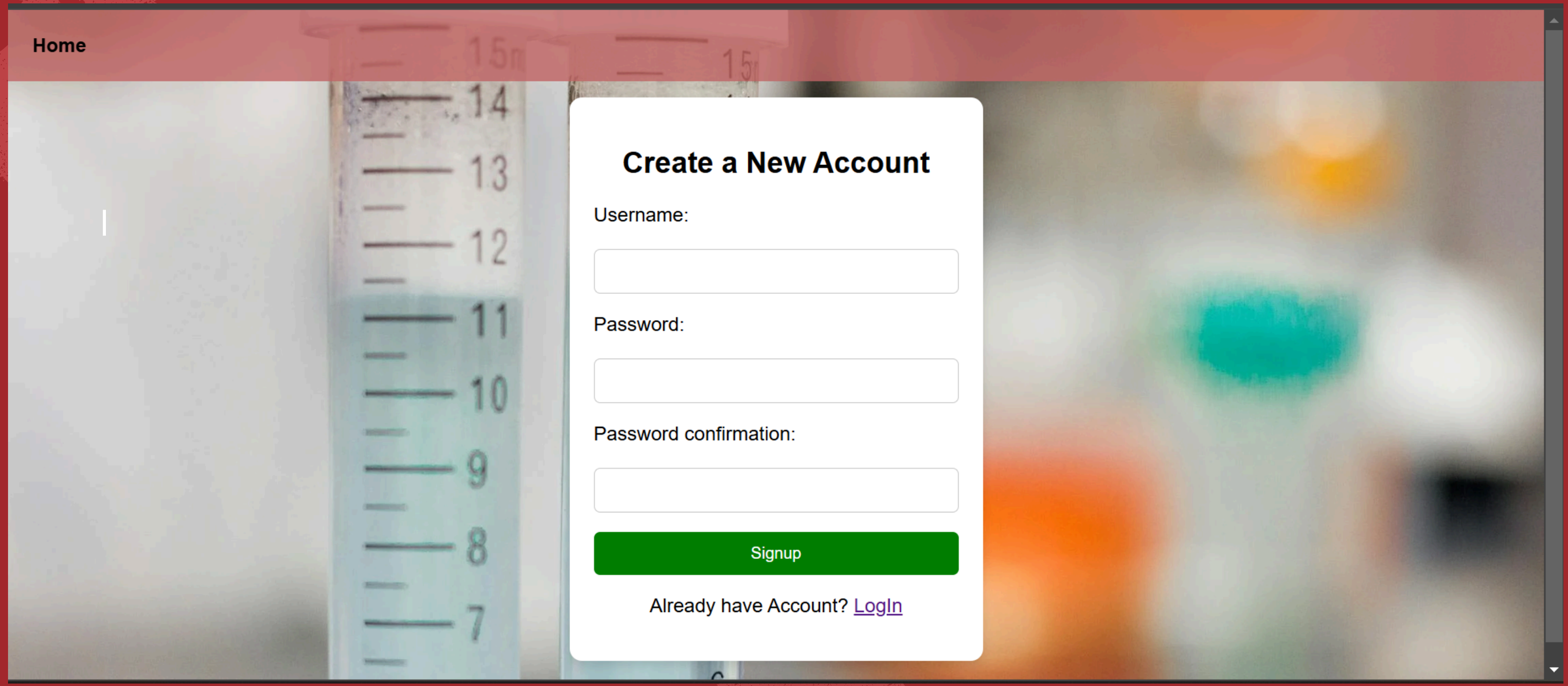
Welcome to Blood Group Identification

This platform allows you to easily identify your blood group by uploading images of your blood cells. Our cutting-edge analysis tool ensures accurate and quick results, making it essential for medical treatments and emergency situations.

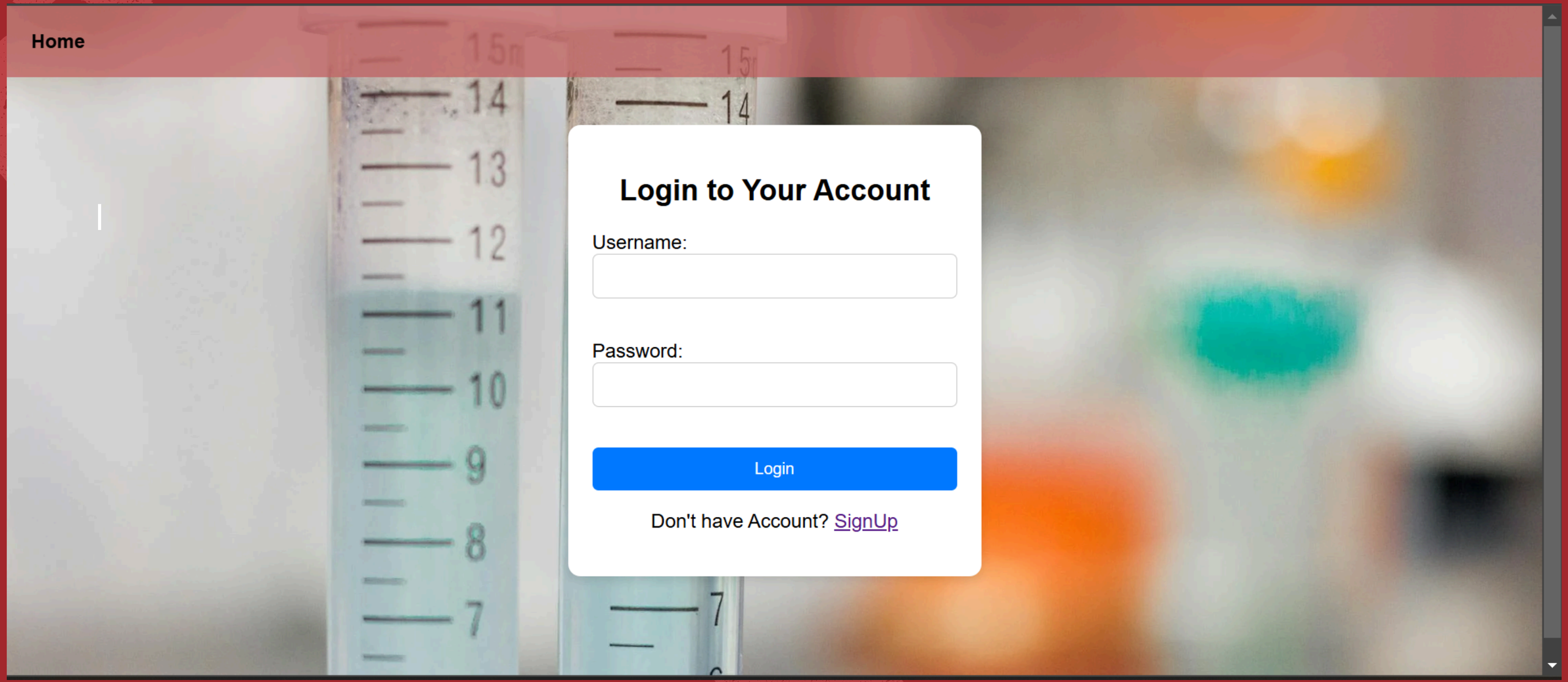
Simply log in or sign up to get started. Upload the required images and receive your blood group information in no time!

Get Started

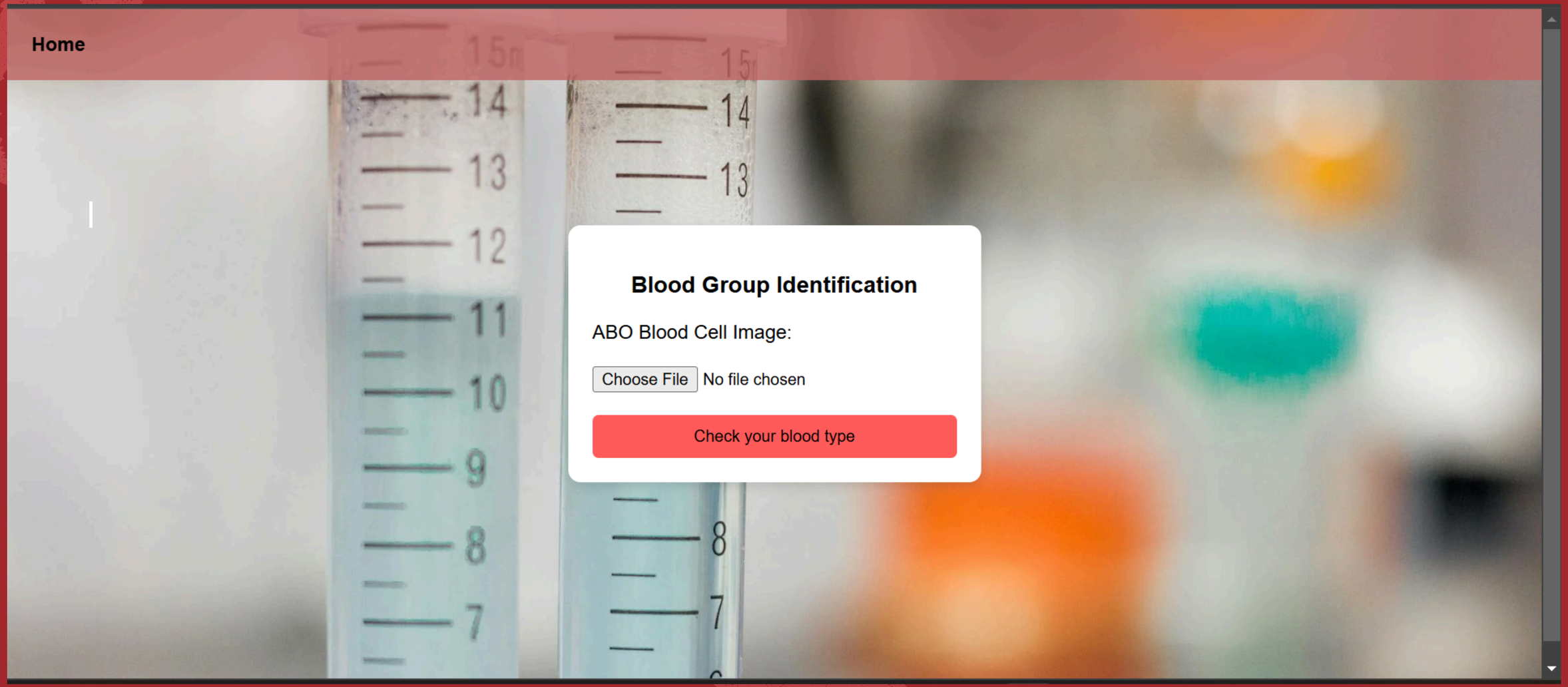
SIGNUP PAGE


Home
Create a New Account
Username:
Password:
Password confirmation:
Signup
Already have Account? LogIn

LOGIN PAGE


Home
Login to Your Account
Username:
Password:
Login
Don't have Account? SignUp

PROFILE PAGE



PARTIAL OUTPUT

when uploaded image recognized feature, original image with contour count will display.

Home

Blood Group Identification

ABD Blood Cell Image:

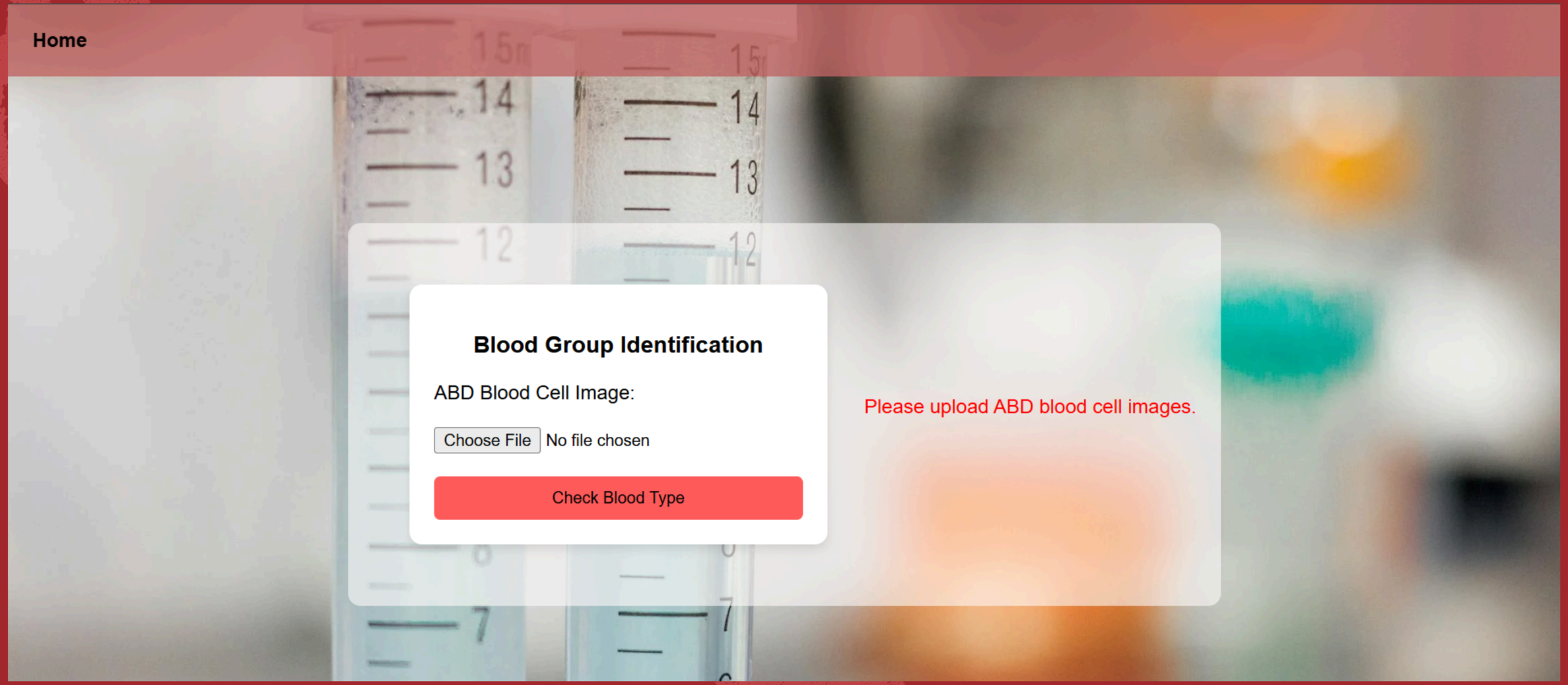
Choose File No file chosen

Check Blood Type

ABD Blood Cell Image:

Contour Count: 1

when image is not uploaded, error massage will be display.



FINAL OUTPUT

Home

Blood Group Identification

ABD Blood Cell Image:

Choose File No file chosen

Check Blood Type

Predicted Blood Type:

AB+

ABD Blood Cell Image:

Processed Image:

CONCLUSION

- The Blood Group Identification System is built using Django for secure user authentication.
- It employs OpenCV for advanced image processing techniques like grayscale conversion, blurring, thresholding, and contour, etc.
- The system analyzes uploaded blood cell images to identify blood types accurately.
- Results, including contour counts, original - processed image and blood type, are displayed directly on the user's profile page.
- The application offers a seamless and user-friendly experience for personal and medical use.
- Robust security measures ensure the protection of user data while enhancing accessibility to blood typing information.

TEAM MEMBERS

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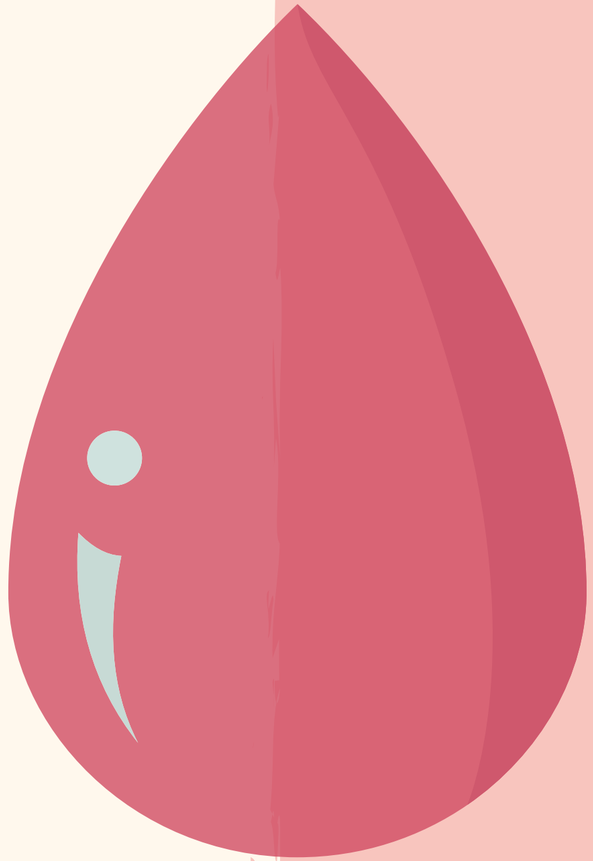

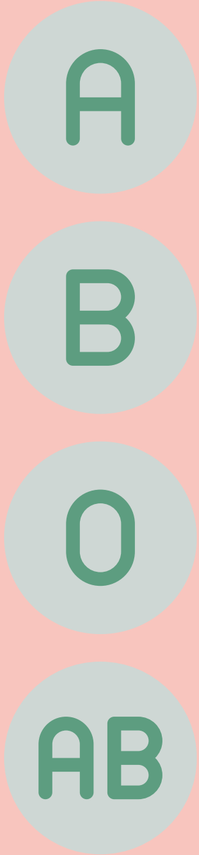

THANK YOU