ASDGenus Documentation

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ASDGenus Overview

1. Target Audience

- Medical practitioners (doctors, EEG technicians, etc.)
- Researchers involved in Autism Spectrum Disorder (ASD) research

2. Supported EEG file type

- In current version (1.0), .vhdr extension is supported. Other EEG file extensions will be included in the coming updates.

3. System Architecture

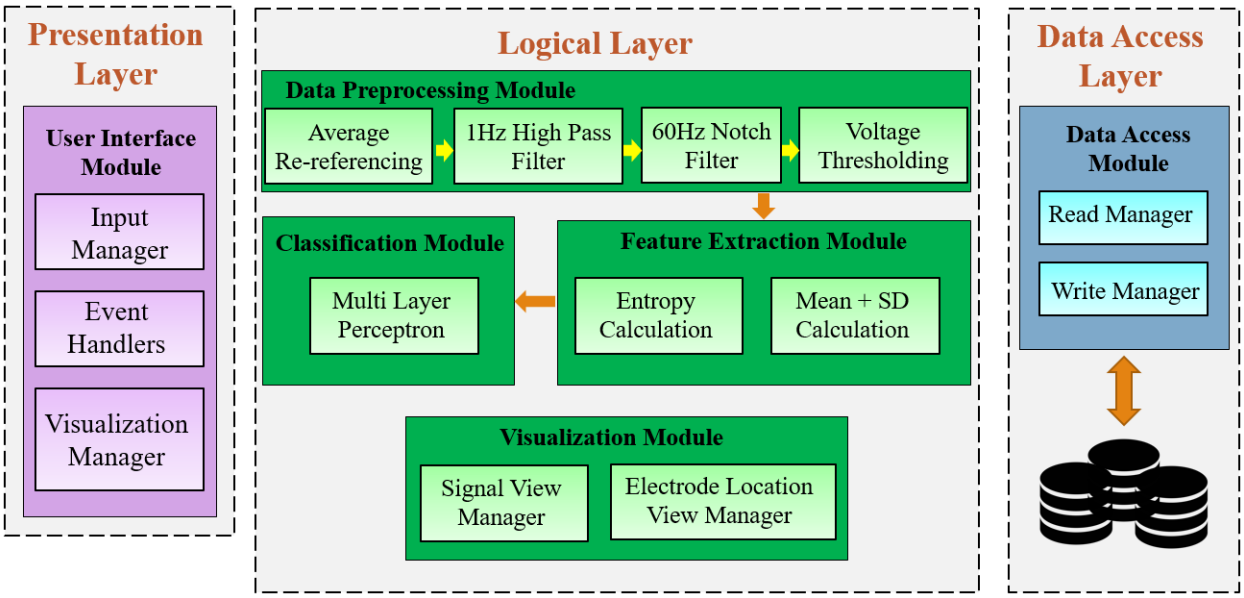

Figure 1: Overall System Architecture

4. System Output

- System outputs severity of ASD. The results are of four categories: No ASD (severity: 0-2), Low Risk for ASD (severity: 3 - 6), Mild ASD (severity: 7 - 12) and Severe ASD (severity: 13 - 26). The severity score is similar to that of ADOS-2 score.

Quick Start Guide

This section explains the functionalities of the entire system step by step. Users can follow them in order to complete the action they need. Each one of them is explained with numbering steps orderly and giving original user interfaces. Thus, users can easily adapt to them.

1. Login

This is the landing page for all users when they access the ASDGenus first. Every one of them needs to login to the system first if they have already registered with ASDGenus. Registered users can log in to the system as follows.

1. Enter the email address you provided at registration in the Email field.
2. Enter the password you provided at registration in the Password field.
3. After providing the email and password you can click on ***'LOGIN'*** button. If they match, you will get access to the HOME page of the system. If they do not match you will see a message saying that email and password do not match. Then, try again giving correct details.

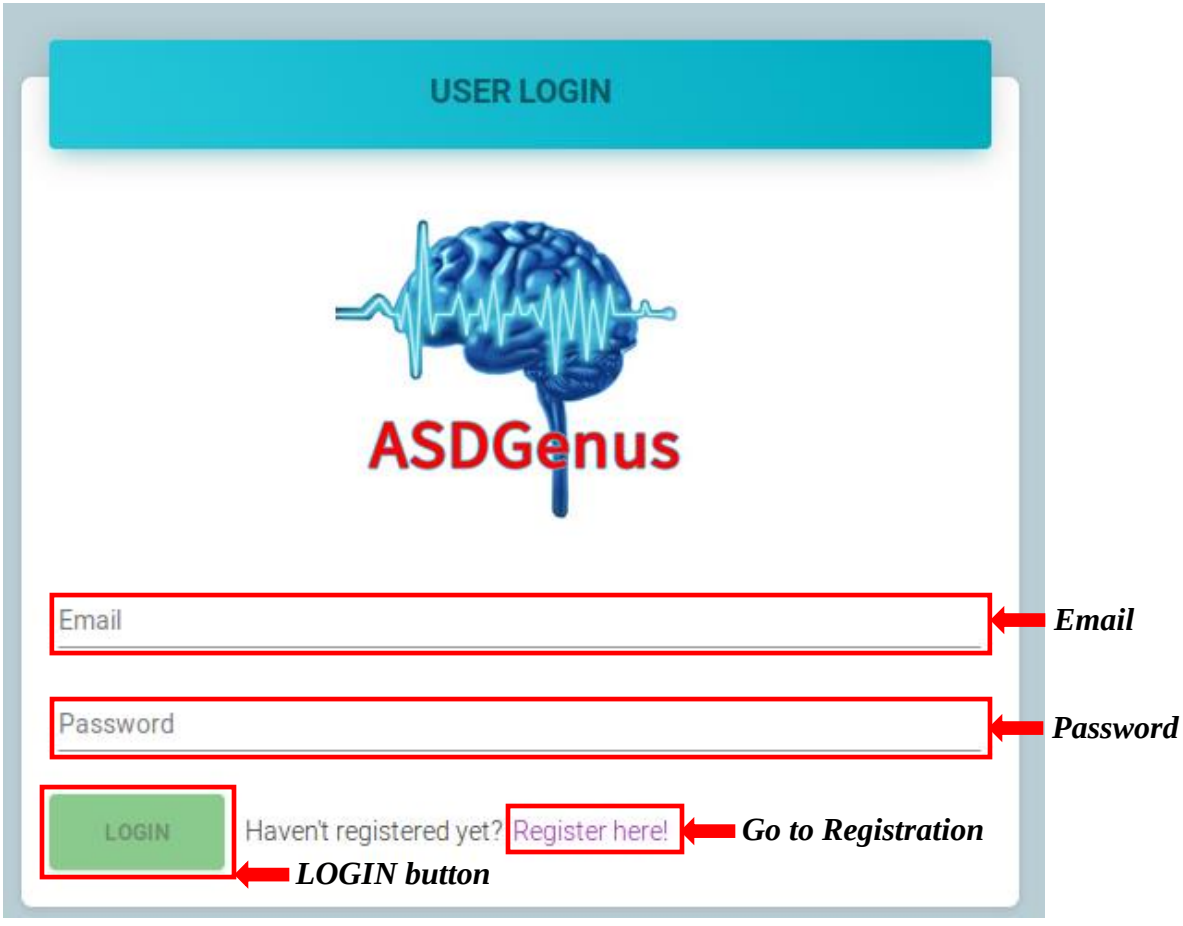

Figure 2.1: Login page

2. Registration

This page lets users register themselves at the system by providing a name, email, and password. Users can access this page by clicking the ***'Register here!'*** phrase as appeared in the login page above. Follow the below steps to register.

1. Enter your name in the Name field.
2. Enter your email in the Email field. The email address should be unique to you. Which means no two users can register by using the same email address.
3. Enter your password in the Password field.
4. Click on the Register button to complete the registration. The register button will be enabled once all the fields are filled correctly.

After completing the registration, the login page will be displayed for users. Then, users can log in to the system as explained above (in ***1. Login)***. If you have already registered and need to go back to the Login page, click on ***'Login here!'*** phrase.

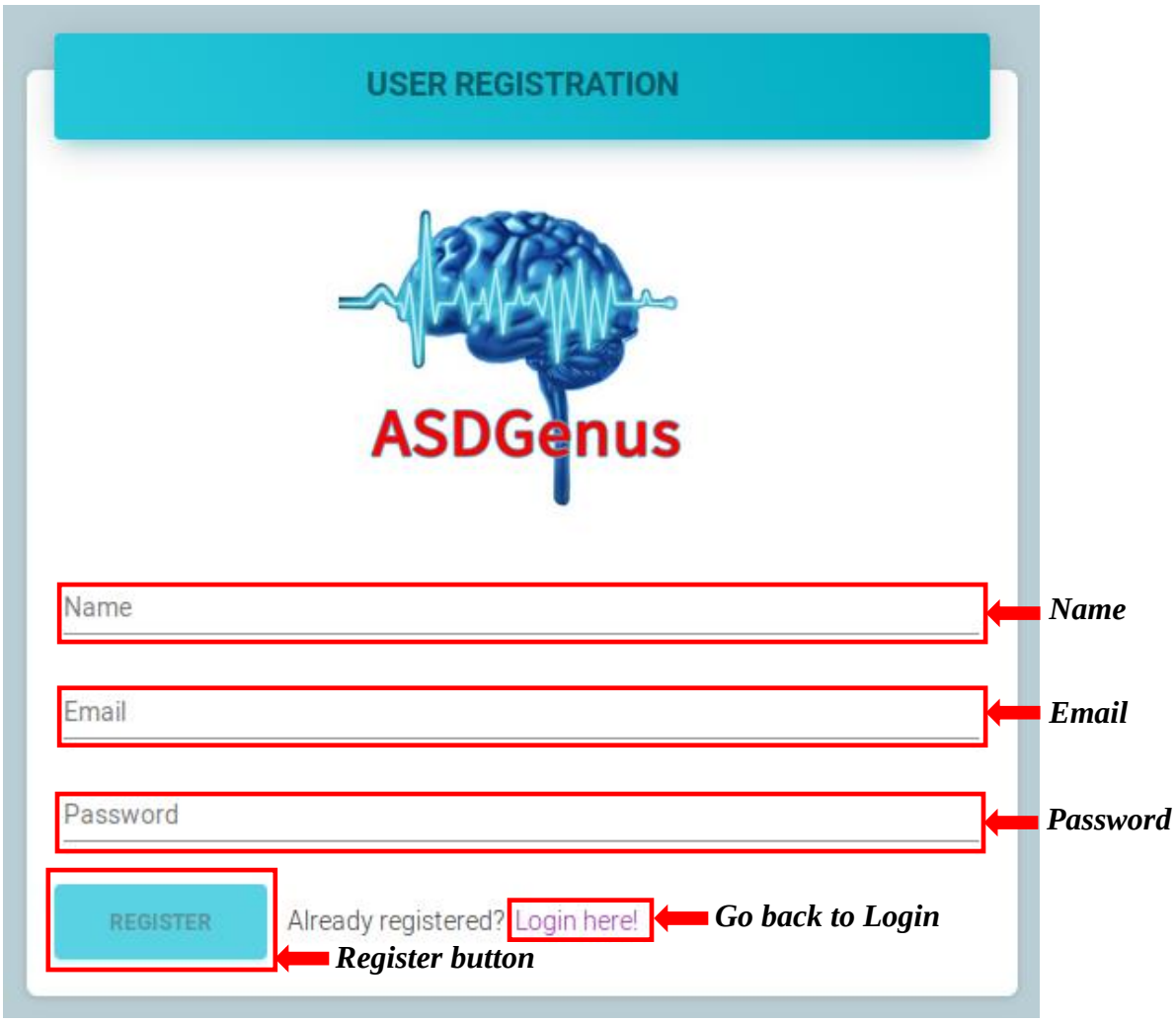

Figure 2.2: Registration Page

3. ASD Classification

This can be considered as the core function of the system. Users can classify ASD by providing the raw EEG data to the system. The complete classification is divided into three main tasks such as Data Selection, Data Uploading, and Classification. All three tasks are defined below orderly.

3.1 Data Selection

1. Click on the ***'Add Files'*** button. This will open up your file manager.

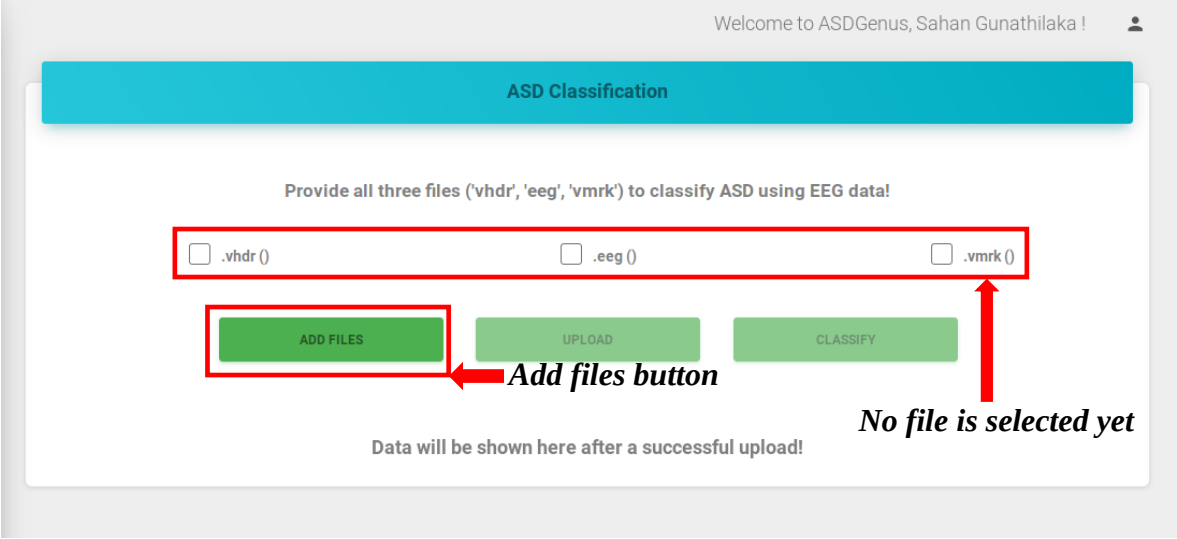

Figure 2.3.1.1: Data Selection

2. Select the correct raw data files by navigating to their path/location. You can select three files one after another or all at once (by pressing and holding Ctrl and selecting).

Users have to select three file types such as '.vhdr', '.vmrk', and '.eeg'. Once files are correctly selected users can see that the ***'Upload'*** button will get enabled as well as three checkboxes for three files get automatically selected. For ignoring the errors, three files should have the same base name. You can see it in figure 2.3.1.2 below.

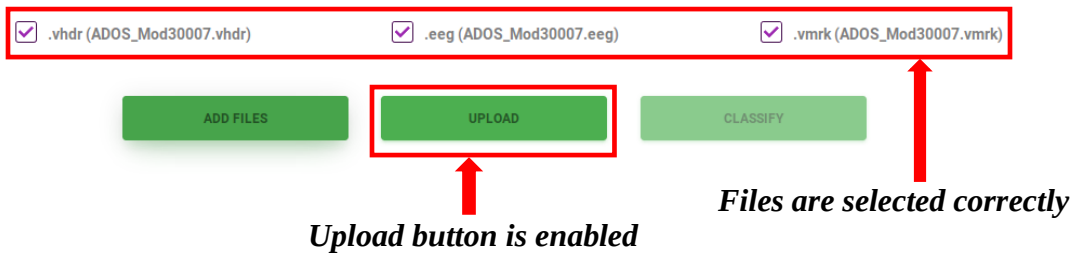

Figure 2.3.1.2: Data Selection succeeded

3.2 Data Uploading

After successfully selecting data files, you can simply click on the ***'Upload'*** button to upload selected data files. It will show the progress of file uploading to the user as shown in figure 2.3.2.1 below.

Figure 2.3.2.1: Selected data files being uploaded

After successfully uploaded, you can see the output in the same manner as shown in figure 2.3.2.2 below. It will show an EEG signal for the uploaded EEG data.

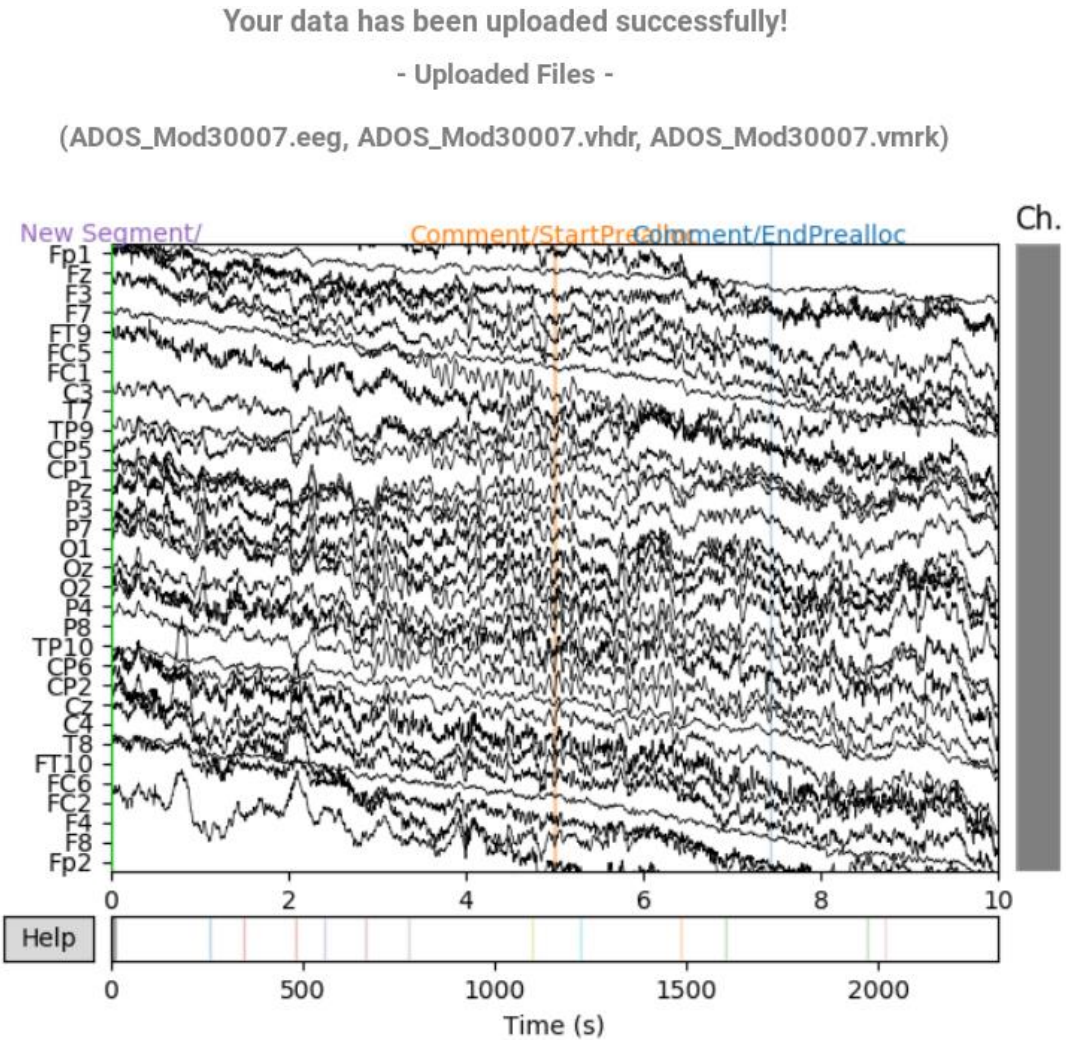

Figure 2.3.2.2: EEG Signal for uploaded data

3.3 Classification

Once the upload process is successful, the classification button will be enabled and you can start classification. This will take around 2 – 3 minutes since preprocessing, feature extraction, and classification are happening behind.

To classify, just click on the ***'Classification'*** button.

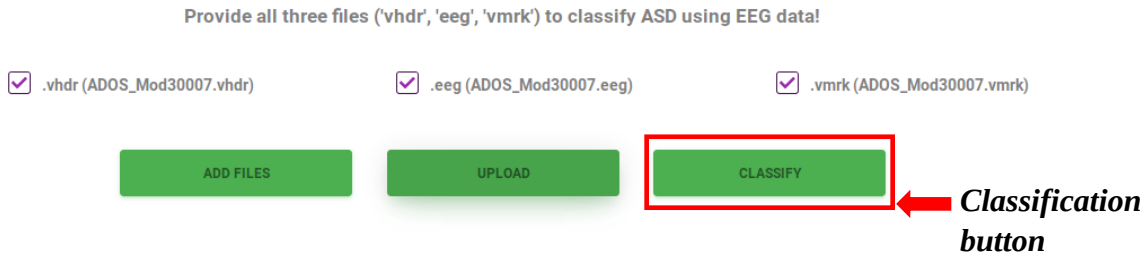

Figure 2.3.3.1: Selected data files being uploaded

After the classification is successful, the results will be shown in figure 2.3.3.2 below. This result is not yet saved. You have to save this result if you need to keep it for future needs. There are two ways to save new results and they will be explained in the result section later in this guide.

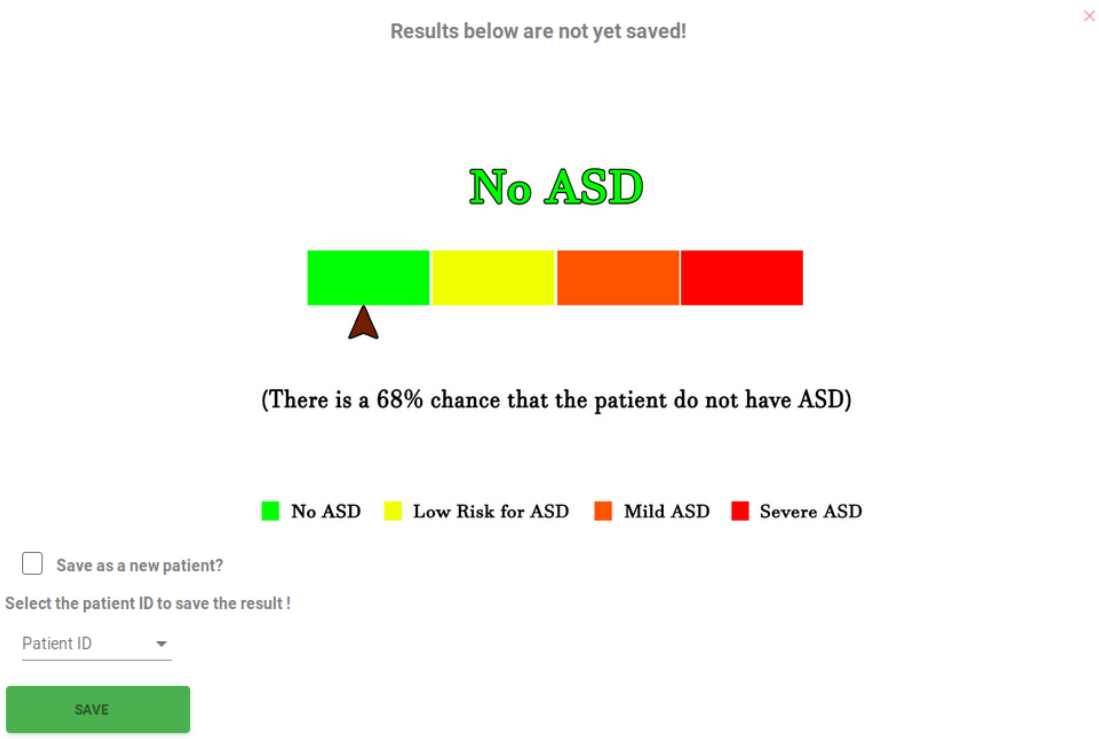

Figure 2.3.3.2: Selected data files being uploaded

4. Patient Maintenance

This section describes all the functions available for patient management in the system.

4.1 See all Patients

Click on ***'Patients'*** from side bar items.

This will show all the saved patients in a tabular manner as shown in figure 2.4.1 below.

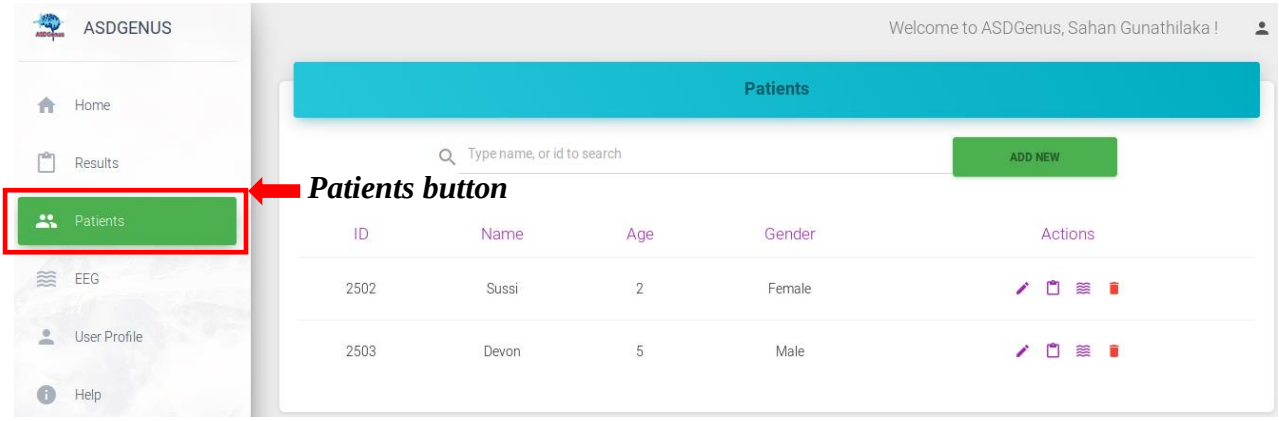

Figure 2.4.1: All patients

4.2 Add New Patient

1. Click on ***'Add New'*** button in patients page. This will show sections to be filled for a new patient.

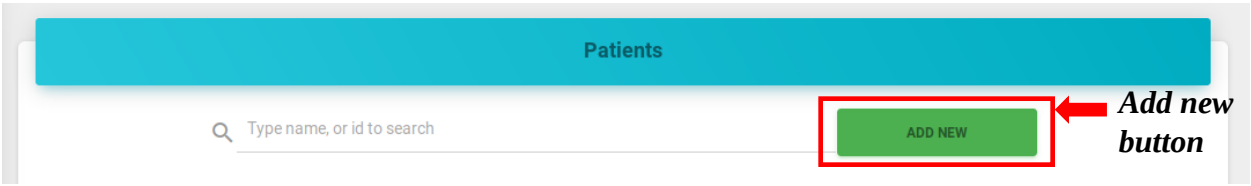

Figure 2.4.2.1: Add new button

2. Enter required details in the fields as shown in the below figure 2.4.2.2 and click on ***'Save'*** button. The save button will be enabled after filling the fields correctly.

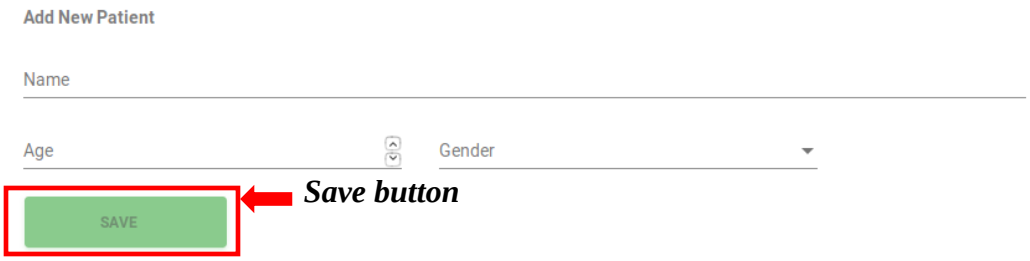

Figure 2.4.2.2: Add new patient form

4.3 Update Patient's Details

1. Click on ***'Edit'*** icon as shown in the figure 2.4.3.1 below for the patient which needs to be updated. This will open a form section to update details as shown in figure 4.3.2 below.

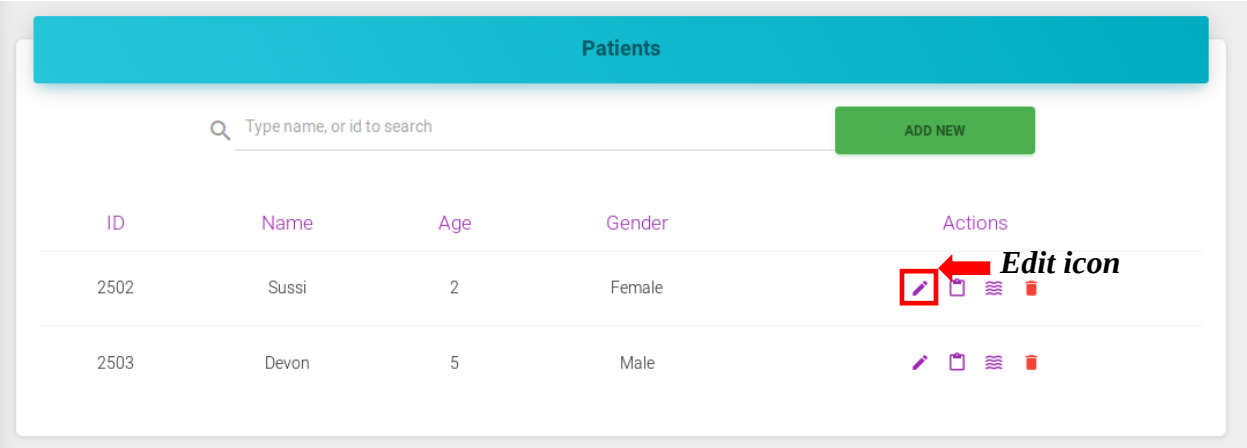

Figure 2.4.3.1: Update patient details

2. Enter new details to be updated for the patient.
3. Click on ***'Update'*** button.

Figure 2.4.3.2: Update patient details section

After update is successful, you can see the updated details inside the table itself.

4.4 View Patient's all results

Click on ***'Result'*** icon inside the patient table for the required patient.

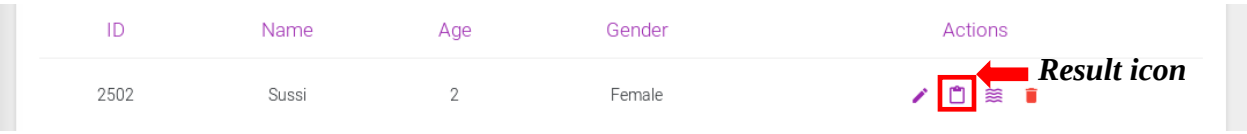

Figure 2.4.4.1: Result icon for patient

This will take you into the results page and show all the result for that patient as shown in the figure 2.4.4.2 below.

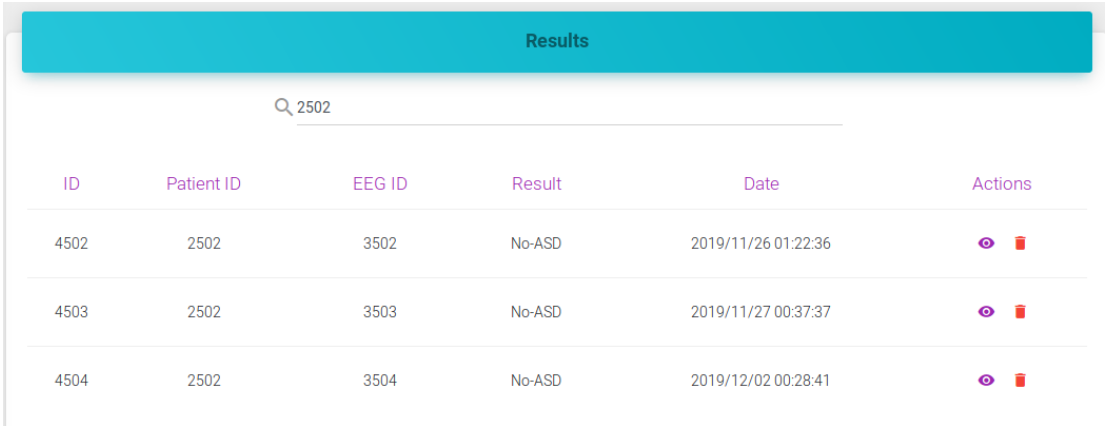

Figure 2.4.4.2: All results for the patient

4.5 View Patient's all EEG data

Click on ***'EEG'*** icon inside the patient table for the required patient.

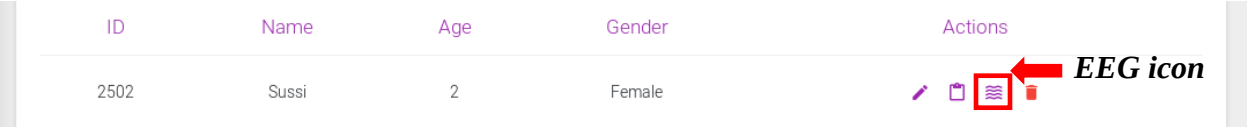

Figure 2.4.5.1: EEG icon for the patient

This will take you into the EEG data page and show all the EEG data details for that patient as shown in the figure 2.4.5.2 below.

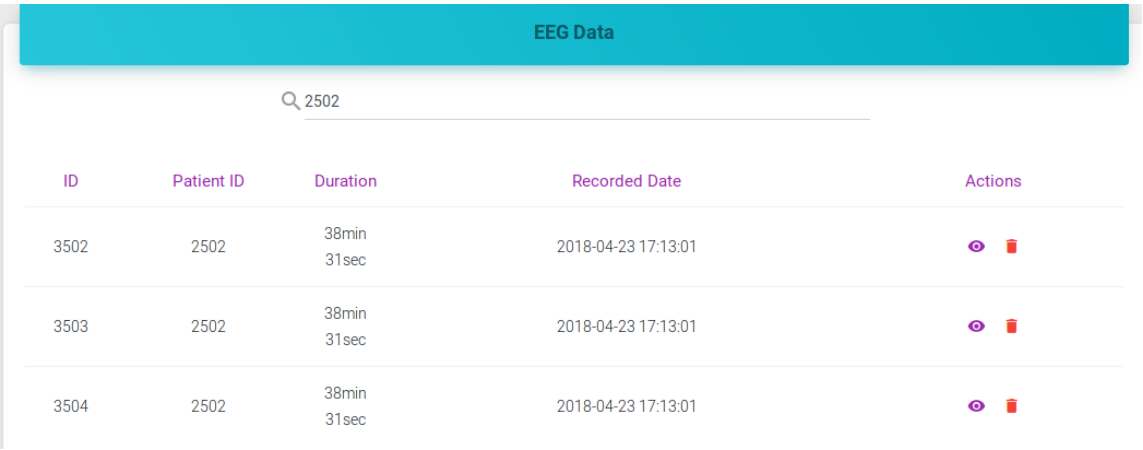

Figure 2.4.5.1: EEG data details for the patient

4.6 Delete Patient

1. Click on ***'Delete'*** icon inside the patient table for the patient.

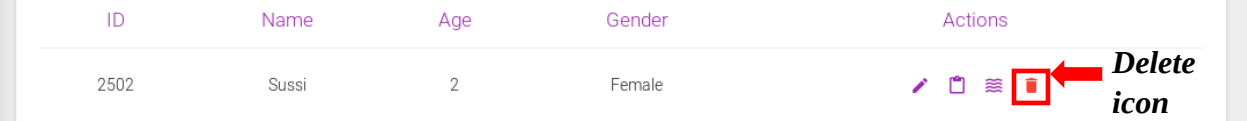

Figure 2.4.6.1: Delete icon for the patient

This will open up a confirmation dialog box to complete the deletion.

2. Click on the ***'Yes'*** button on the dialog box. This will delete all the results and EEG data saved for that patient too.

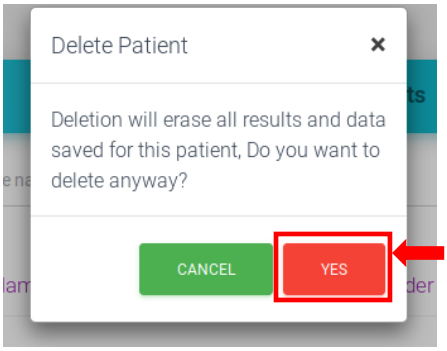

Figure 2.4.6.2: Confirmation dialog box for the deletion

If you still want to cancel the deletion, click on the ***'Cancel'*** button on the dialog box instead of the ***'Yes'*** button.

5. Result Maintenance

This section describes all the functions available for results management in the system.

5.1 See all results

Click on the ***'Results'*** button from sidebar items.

This will show all the saved results in a tabular manner as shown in figure 2.5.1 below.

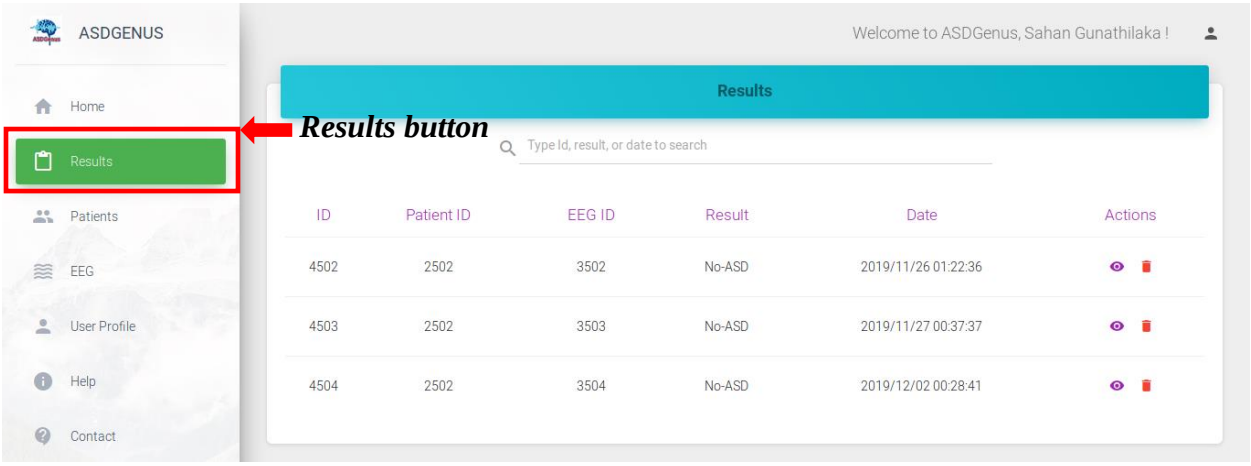

Figure 2.5.1: All results

5.2 Save a new result

Results can only be saved just after a classification process. Thus, after classification, there are two ways to save results. One way is to save the result for an existing patient. The second way is to save the result for a new patient.

By default, results are appeared to save for an existing patient. You can see the section for saving the result as in figure 2.5.2.1 below.

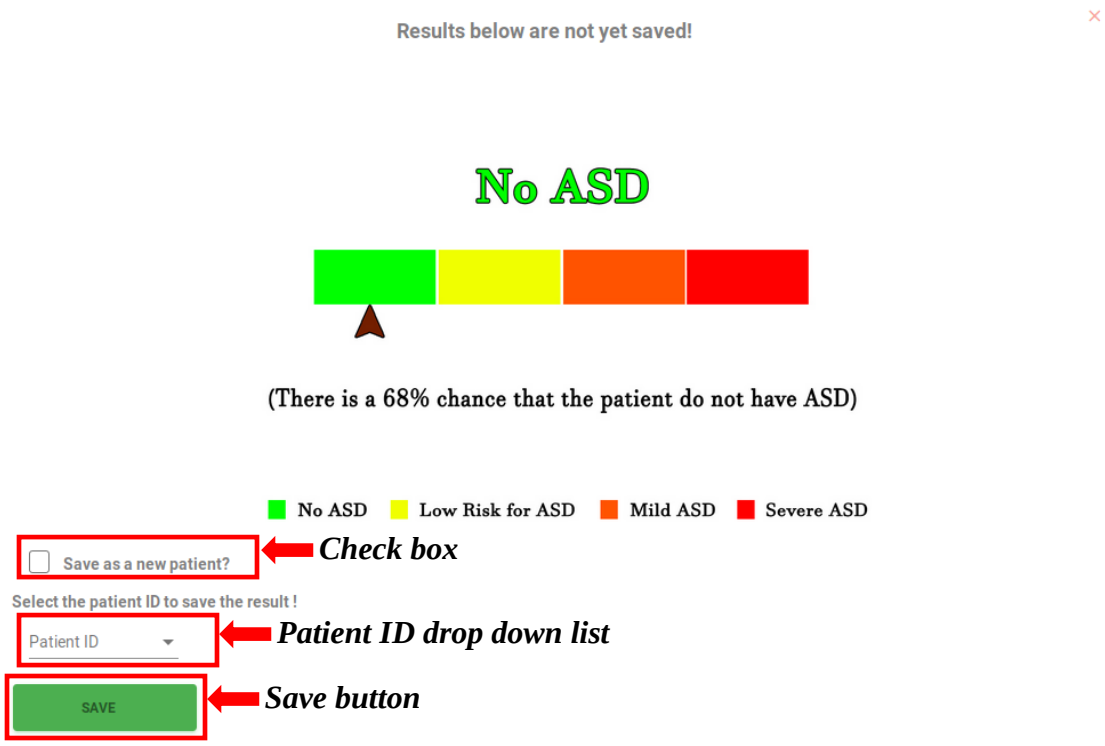

Figure 2.5.2.1: Save the result for an existing patient

Save the result for an existing patient

1. Click on the ***'Patient ID'*** drop-down list as in figure 2.5.2.1 above.
2. Select the required patient ID which needs to be saved the result.
3. Click on the ***'Save'*** button to save the result.

Save the result for a new patient

1. Click on the ***'Checkbox'*** shown in figure 2.5.2.1 above. It will open a new section to save a new patient. You can see it from figure 2.5.2.2 below.
2. Enter details for a new patient.
3. Click on the ***'Save'*** button to save the result for the new patient.

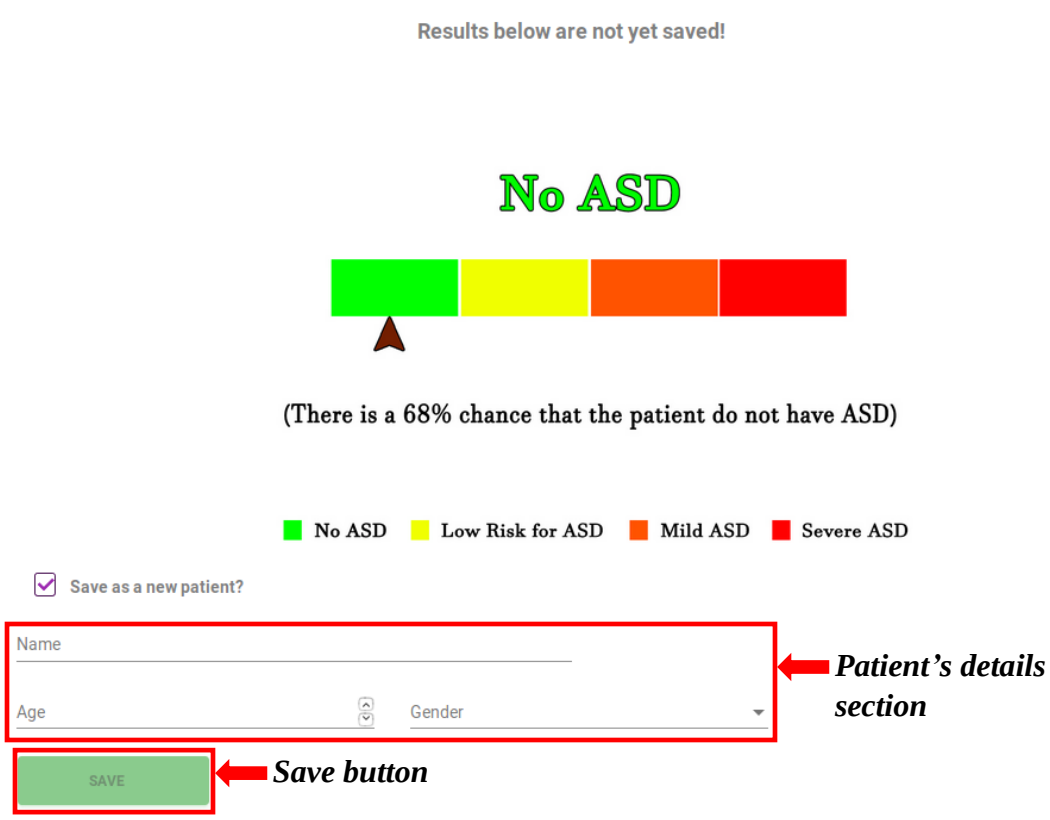

Figure 2.5.2.2: Save the result for a new patient

You can see that the result will be added to the table after saving is successful. While saving a result, it will also save the corresponding EEG data automatically. Thus, there will be not a separate section or a way to save EEG data for the current system.

5.3 View individual result

This will allow you to view saved results individually.

1. Click on the ***'View'*** icon as shown in figure 2.5.3.1 below. It will show the saved result as shown in figure 2.5.3.2 below.

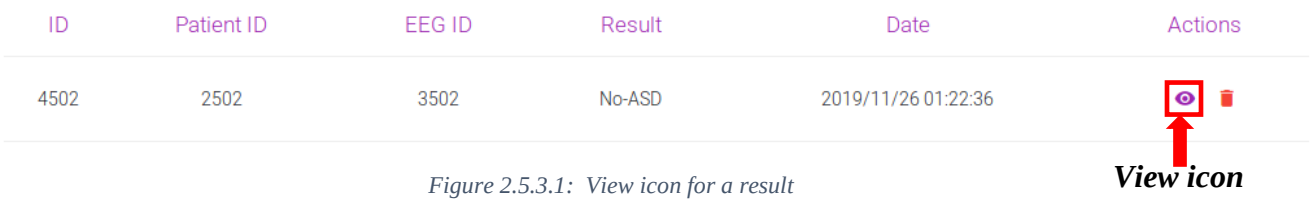

Figure 2.5.3.1: View icon for a result

2. You can close the view by just clicking on the ***'Close'*** icon as shown in figure 5.3.2 below.

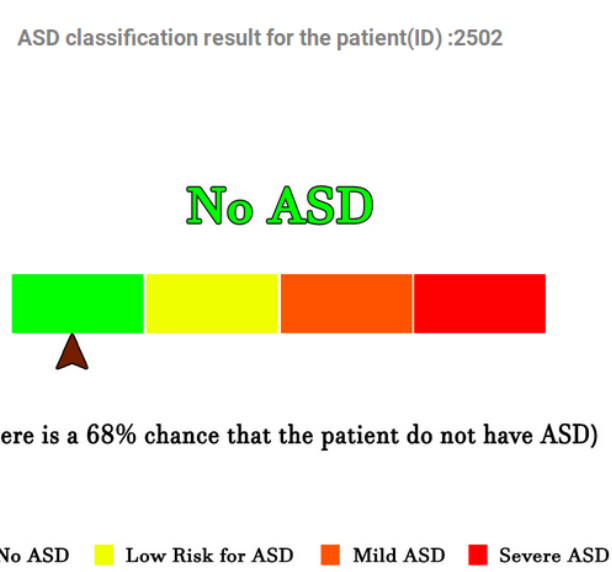

Figure 2.5.3.2: Displaying saved result

5.4 Delete Result

1. Click on the ***'Delete'*** icon inside the result table for the result.

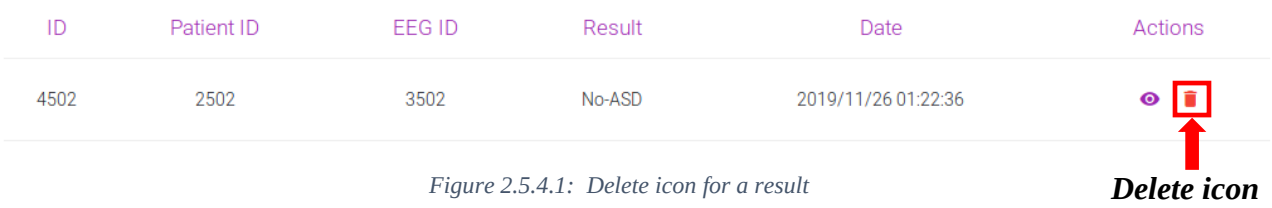

Figure 2.5.4.1: Delete icon for a result

This will open up a confirmation dialog box to complete the deletion.

2. Click on the ***'Yes'*** button on the dialog box. This will delete the result you can see that it will be removed from the table too.

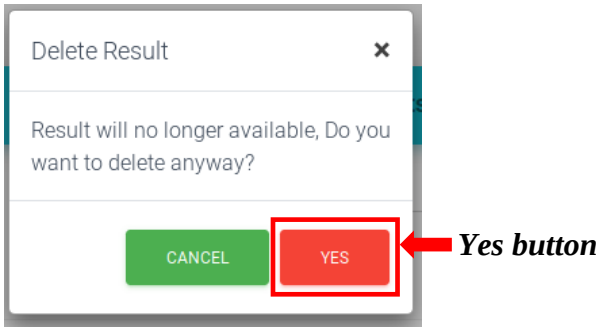

Figure 2.5.4.2: Dialog box for confirming the deletion of a result

If you still want to cancel the deletion, click on the ***'Cancel'*** button on the dialog box instead of the ***'Yes'*** button.

6. EEG Data Maintenance

6.1 See all EEG Data

Click on the ***'EEG'*** button from sidebar items.

This will show all the saved EEG data in a tabular manner as shown in figure 2.6.1 below.

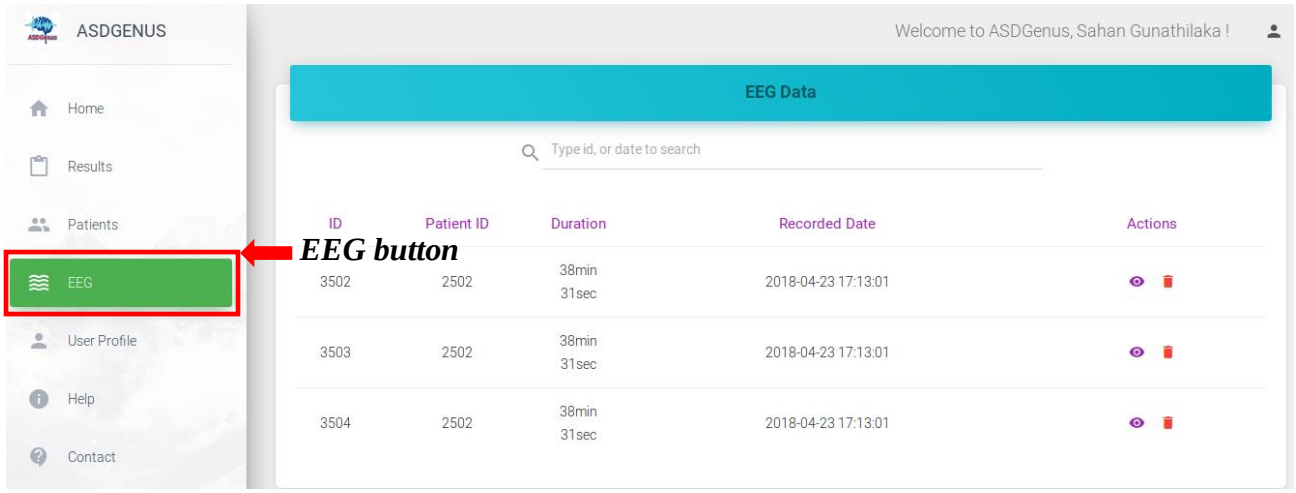

Figure 2.6.1: All EEG data

6.2 View individual EEG Data

This will allow you to view saved EEG data individually.

1. Click on the ***'View'*** icon as shown in figure 2.6.2.1 below. It will show the saved EEG data as shown in figure 2.6.2.2 below.

Figure 2.6.2.1: View icon for a EEG

2. You can close the view by just clicking on the ***'Close'*** icon as shown in the figure 2.6.2.2 below.

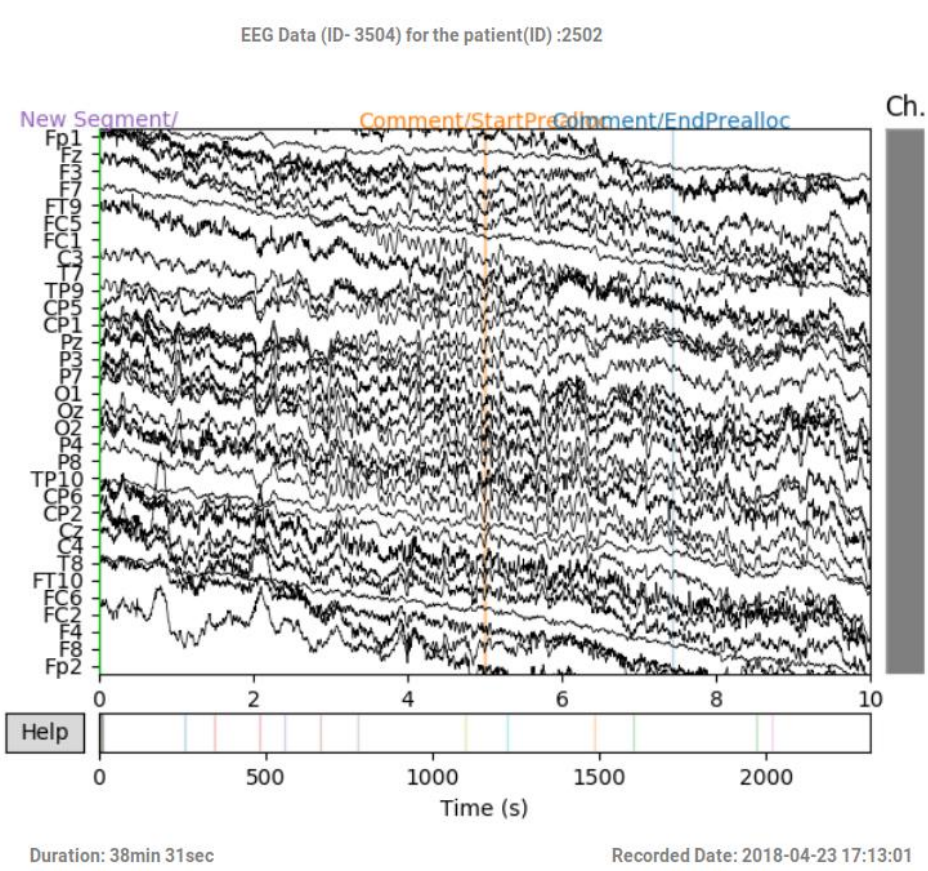

Figure 2.6.2.2: Displaying saved EEG

6.3 Delete EEG data

1. Click on the ***'Delete'*** icon inside the EEG data table for the EEG data.

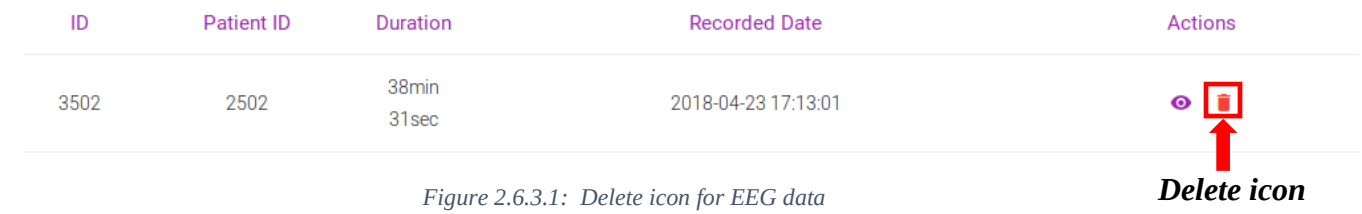

Figure 2.6.3.1: Delete icon for EEG data

This will open up a confirmation dialog box to complete the deletion.

2. Click on the ***'Yes'*** button on the dialog box. This will also delete the result corresponding to the selected EEG data. After deleting, you can see that it will be removed from the table too.

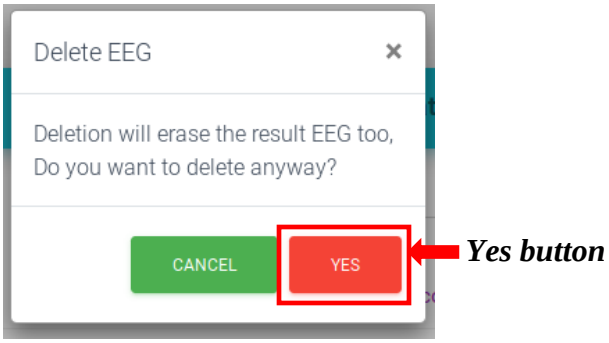

Figure 2.6.3.2: Dialog box for confirming the deletion of an EEG

If you still want to cancel the deletion, click on the ***'Cancel'*** button on the dialog box instead of the ***'Yes'*** button.

7. User Profile

Click on the ***'User Profile'*** button from sidebar items.

It will display the user profile page as shown in figure 7.1 below.

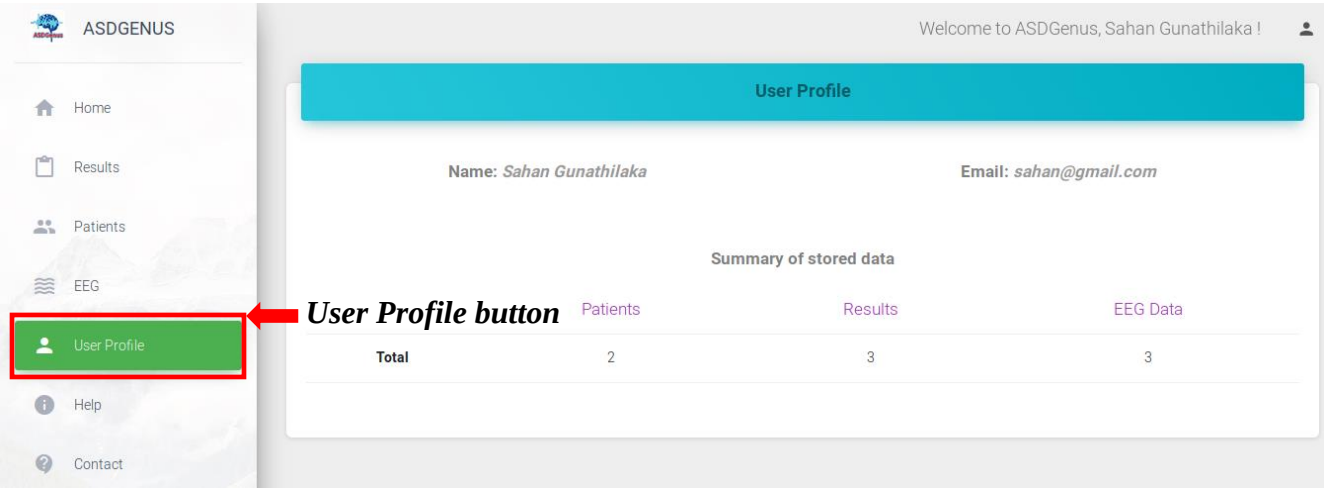

Figure 2.7.1: User Profile page

This page shows the name of the user and the email address of the user. Further, it shows the total number of patients, results, and EEG data which are saved on the system by a particular user. You can see them in figure 2.7.1 above.

8. Help

You can find out this help documentation inside the Help page of the system.

Click on the ***'Help'*** button from the sidebar items.

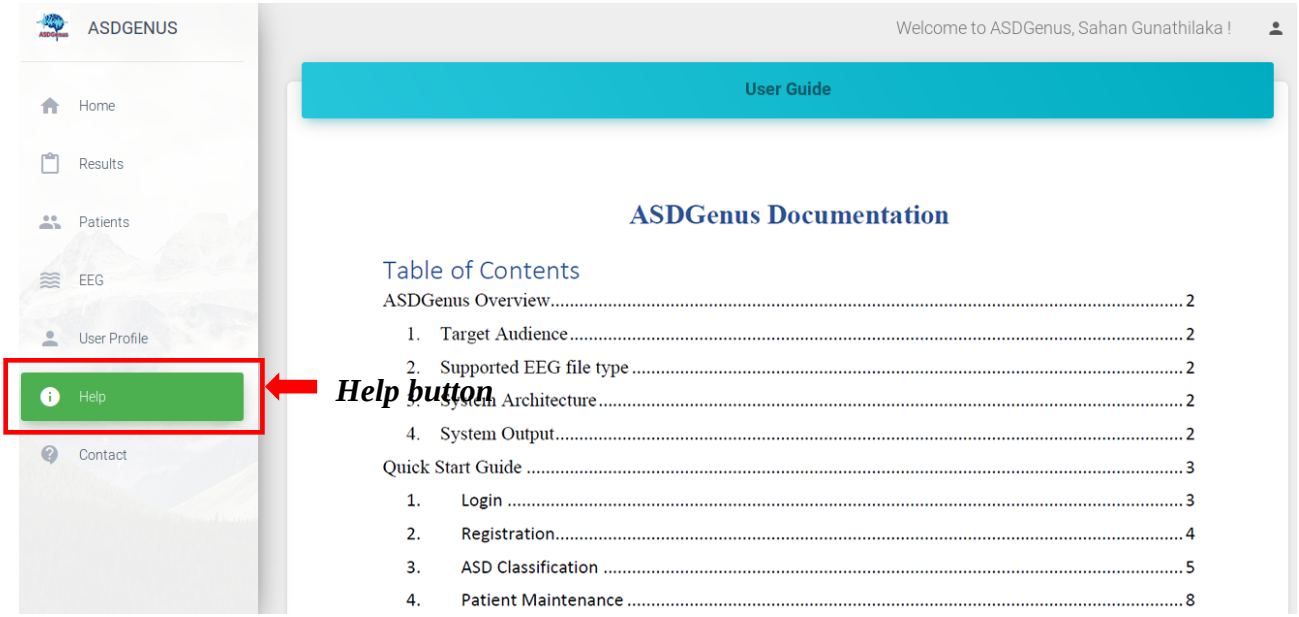

Figure 2.8.1: Help page

9. Contact

This allows users to contact us (system owners) if there is anything to be clarified. Follow the below steps to contact us.

1. Enter your name in the name field. We request this to make our communication more reliable.
2. Enter your email address in the email field. We request this to contact you back via email. We guarantee that we do not misuse your email address by any mean. Thus, provide any of your active email addresses for better communication.
3. Enter your message which you need to ask or clarify from us.
4. Click on the ***'Send'*** button. The ***'Send'*** button will be enabled once you filled the above details correctly.

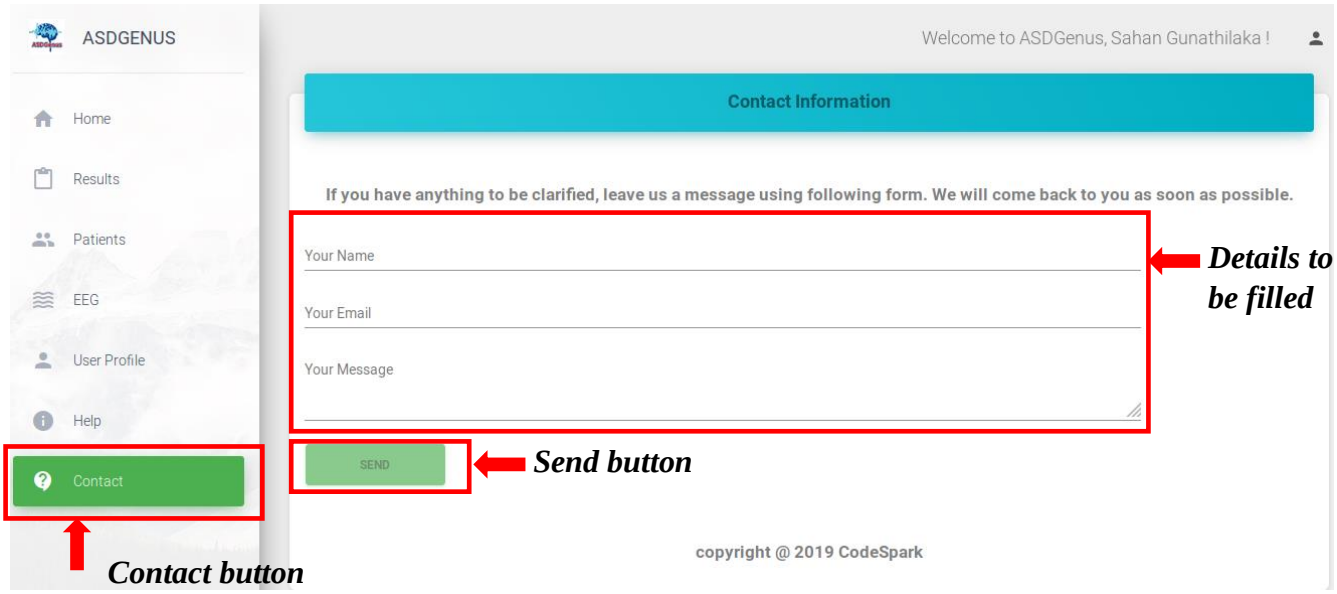

Figure 2.9.1: Contact page

After sending the message successfully, You will be notified with a pop-up message saying that your message is sent successfully.

10. Logout

1. Click on the ***'User'*** icon in the top right corner.
2. Then click on the ***'Logout'*** option.

It will log you out from the system and show the login page back. Refer the following figure 2.10.1 for this.

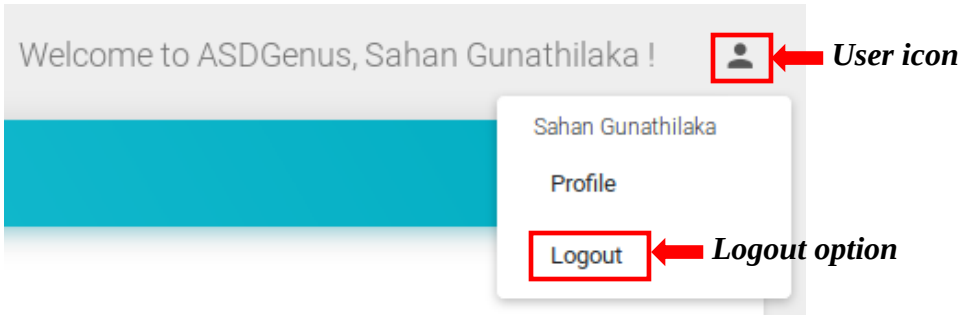

Figure 2.10.1: Logout option