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# User Manual

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Next Eight Pty Ltd  
*Intelligait*

October 2021

Version 1.0

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## Software Description

Intelligait is a web application for the analysis of a person's gait.

### Description

Intelligait uses TensorFlow's pose estimation technology to analyse the hip, knee, and ankle joints to visualise any differences between the left and right joints throughout their gait cycle. The program allows the user to upload a video of a person walking to be analysed. It produces a PDF (Portable Document File) of the tracked data points of each joint for the duration of the video and displays them in easy-to-read graphs. The graphs display a message if it has detected irregular movement for that joint in either the horizontal or vertical direction.

### Benefits and Value

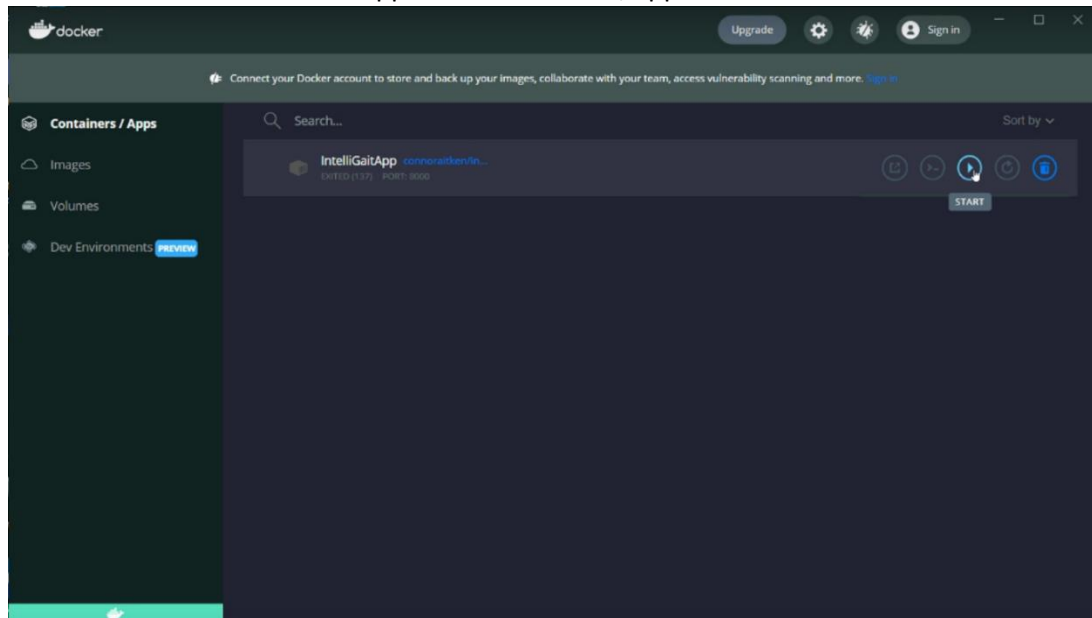
Cheaper, easier to use, no specialised equipment, no dedicated setup area, accessible to any registered user.

### Platform Requirements

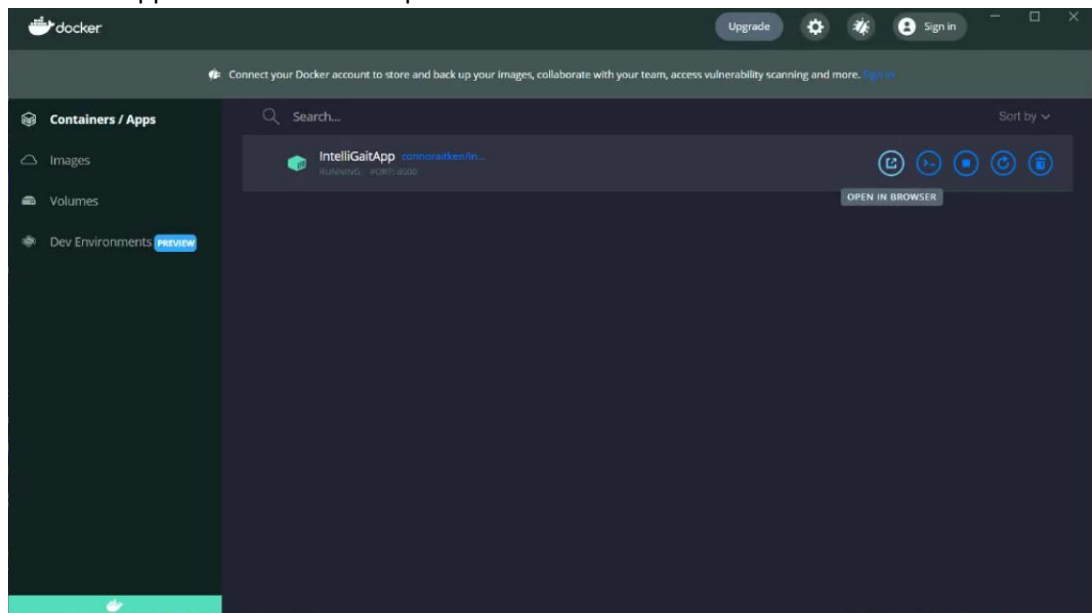
Computer running either Windows or macOS, and any web browser.

## How to Run the Application

1. Open “Docker Desktop”.
2. Click “Start” on the IntelliGaitApp under Containers/Apps.



3. Once the app has started click “Open in Browser”



4. The app will run at the address <http://localhost:8000>. Open this address in your web browser.

## Pose Estimation Module – Ideal Video Configuration

### Ideal Environment

Please advise clients to film in a plain environment (e.g., A hallway), and limit to a single person per frame. This is to reduce any potential issues the model may have with picking up other objects in the frame.

### Ideal Clothing

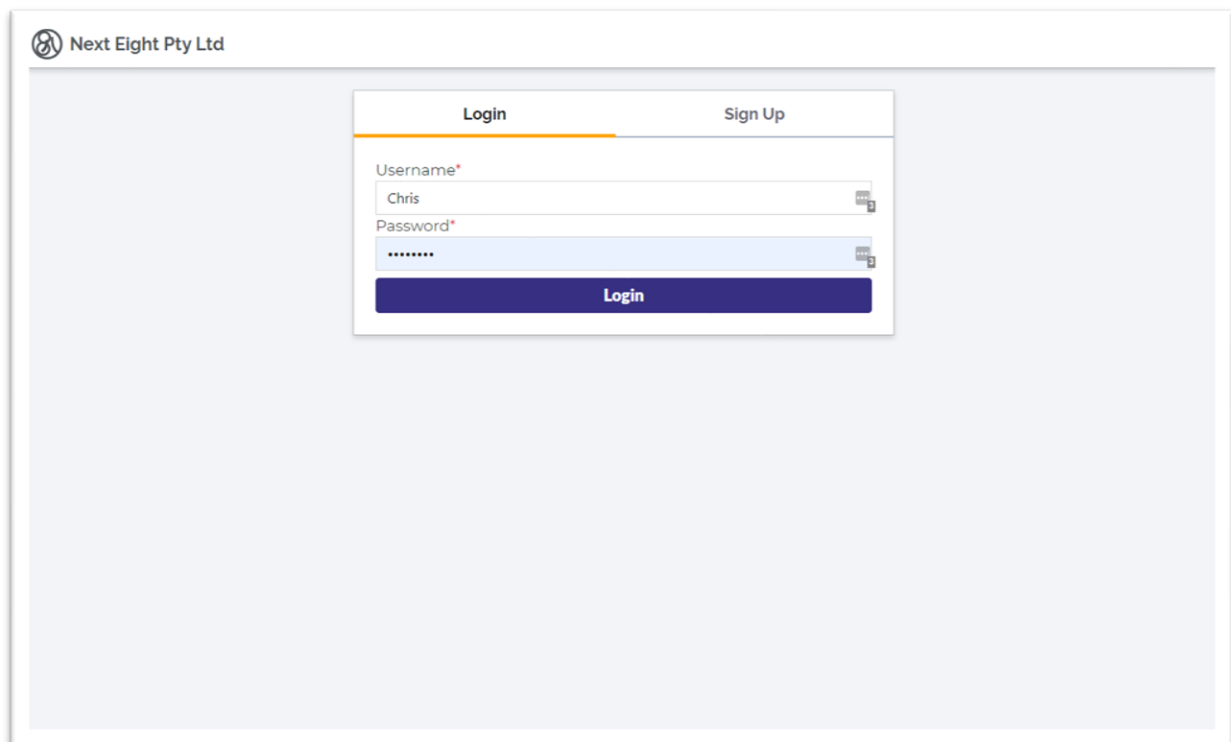
Please recommend that clients wear light coloured clothing and, if they can, clothing of shorter length (e.g., shorts, t-shirts, or singlets). This is to reduce any potential issues the model may have with estimating the pose of the individual.

### Ideal Video Framing & Length

The application has been tested with videos taken from the side and from in front of the individual, but we have had the most success with the front on analysis. That said we would recommend asking the clients to take 2 videos – one from the side and one from the front. Please also advise the clients to limit the videos to 10 seconds or less as to limit the long computational time needed to estimate the pose of the individual.

# User Interface – How to Use the Web Application

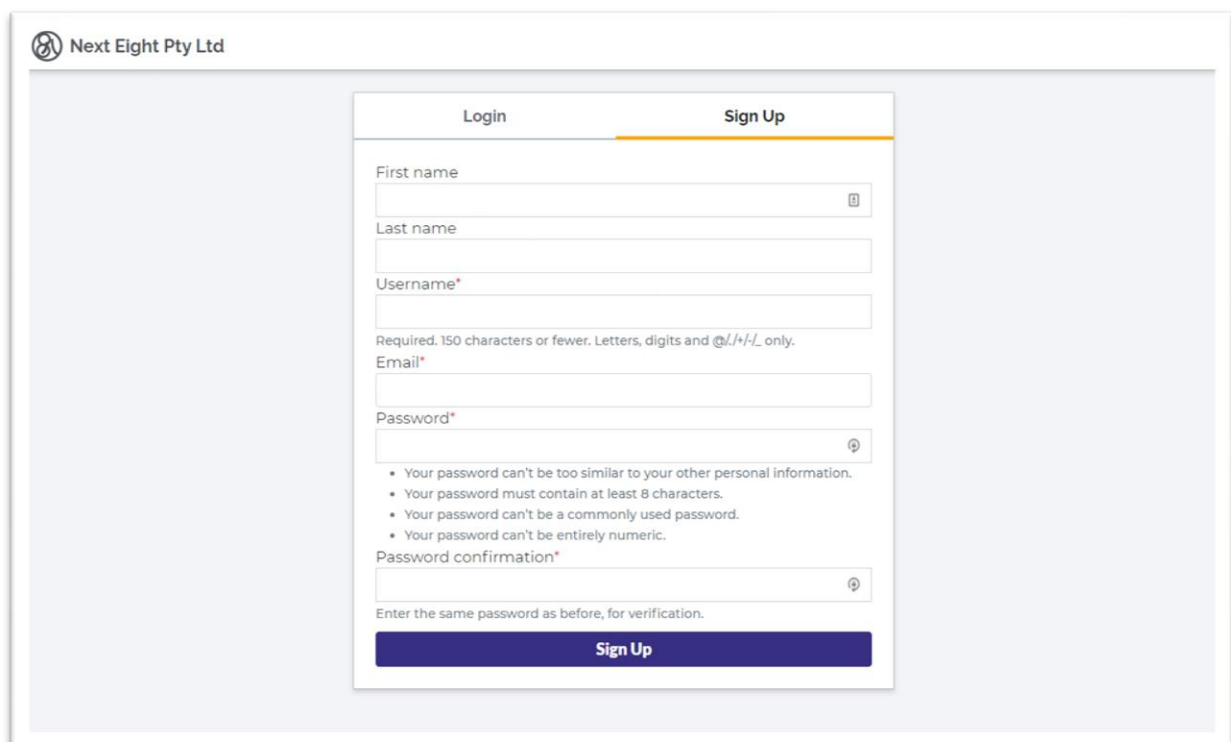
## How to Login & Sign Up



The screenshot shows the login interface for Next Eight Pty Ltd. At the top left is the company logo and name. The main area features a white box with two tabs: 'Login' (selected) and 'Sign Up'. Below the tabs are two input fields: 'Username\*' with the text 'Chris' and 'Password\*' with masked characters. A blue 'Login' button is at the bottom of the form.

When logged out, the first screen you will see is the login screen. You can log in from this page if you have an existing account or click on the “Sign Up” tab to create a new account.

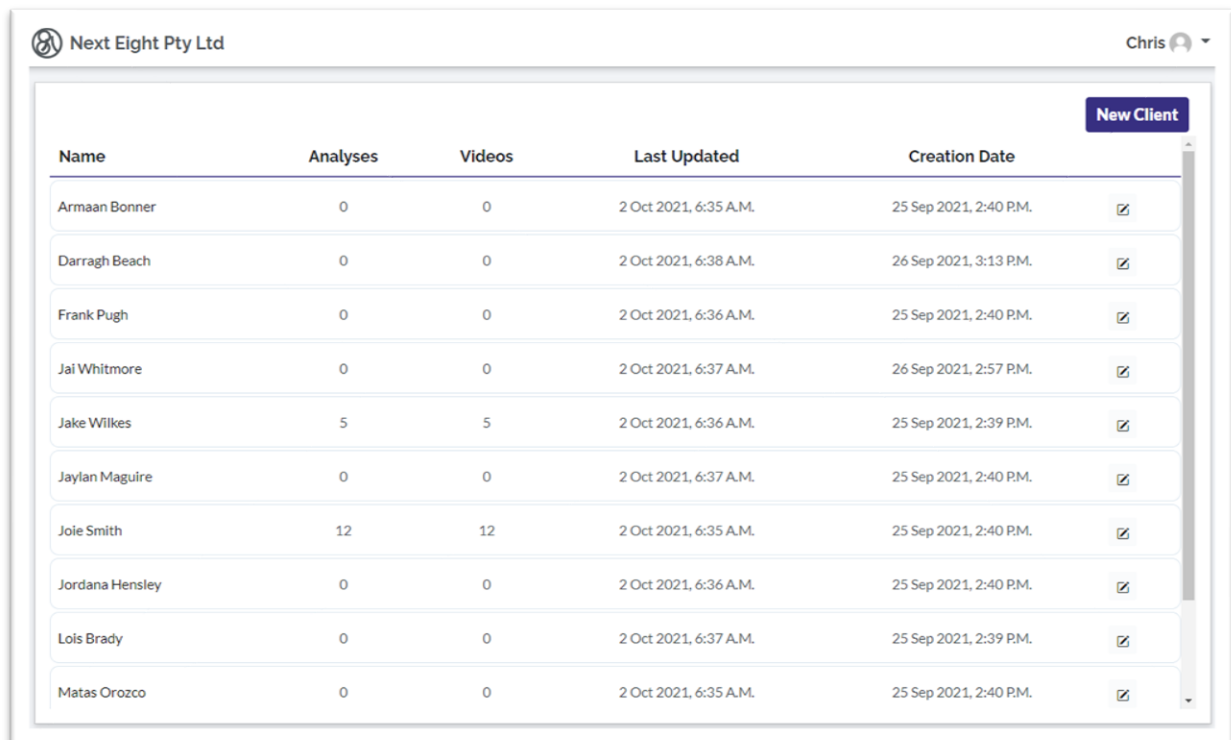
Clicking on the “Sign Up” tab will bring you to the sign-up page:



The screenshot shows the sign-up interface for Next Eight Pty Ltd. At the top left is the company logo and name. The main area features a white box with two tabs: 'Login' and 'Sign Up' (selected). Below the tabs are several input fields: 'First name', 'Last name', 'Username\*', 'Email\*' (with a note: 'Required. 150 characters or fewer. Letters, digits and @./+/-\_ only.'), 'Password\*' (with a strength indicator), and 'Password confirmation\*' (with a note: 'Enter the same password as before, for verification.'). A list of password requirements is shown below the password field. A blue 'Sign Up' button is at the bottom of the form.

Logging in or signing up will both bring you to the Home Screen.

### Viewing the Home Screen/Clients List

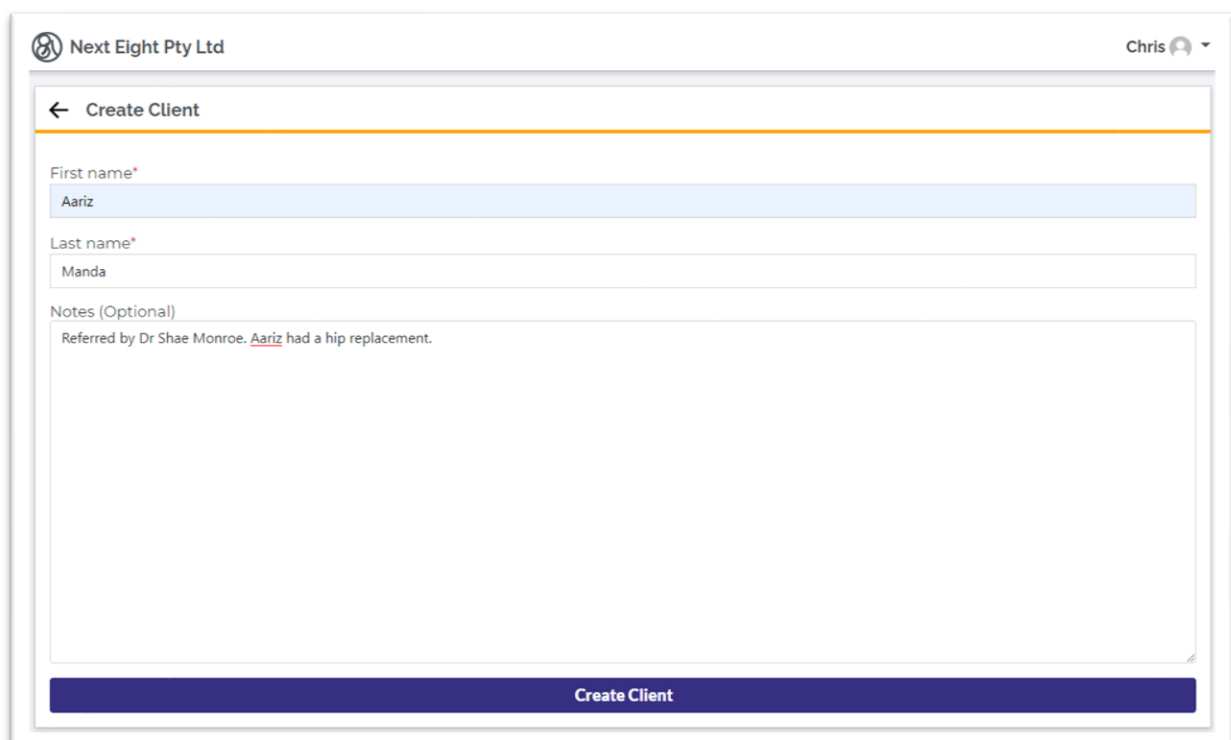


The screenshot shows the 'Next Eight Pty Ltd' interface. At the top right, the user 'Chris' is logged in. A 'New Client' button is in the top right corner. Below it is a table with columns: Name, Analyses, Videos, Last Updated, and Creation Date. The table lists 11 clients, including Armaan Bonner, Darragh Beach, Frank Pugh, Jai Whitmore, Jake Wilkes, Jaylan Maguire, Jole Smith, Jordana Hensley, Lois Brady, and Matas Orozco. Each row has a checkbox in the last column.

| Name            | Analyses | Videos | Last Updated          | Creation Date          |                                     |
|-----------------|----------|--------|-----------------------|------------------------|-------------------------------------|
| Armaan Bonner   | 0        | 0      | 2 Oct 2021, 6:35 A.M. | 25 Sep 2021, 2:40 P.M. | <input checked="" type="checkbox"/> |
| Darragh Beach   | 0        | 0      | 2 Oct 2021, 6:38 A.M. | 26 Sep 2021, 3:13 P.M. | <input checked="" type="checkbox"/> |
| Frank Pugh      | 0        | 0      | 2 Oct 2021, 6:36 A.M. | 25 Sep 2021, 2:40 P.M. | <input checked="" type="checkbox"/> |
| Jai Whitmore    | 0        | 0      | 2 Oct 2021, 6:37 A.M. | 26 Sep 2021, 2:57 P.M. | <input checked="" type="checkbox"/> |
| Jake Wilkes     | 5        | 5      | 2 Oct 2021, 6:36 A.M. | 25 Sep 2021, 2:39 P.M. | <input checked="" type="checkbox"/> |
| Jaylan Maguire  | 0        | 0      | 2 Oct 2021, 6:37 A.M. | 25 Sep 2021, 2:40 P.M. | <input checked="" type="checkbox"/> |
| Jole Smith      | 12       | 12     | 2 Oct 2021, 6:35 A.M. | 25 Sep 2021, 2:40 P.M. | <input checked="" type="checkbox"/> |
| Jordana Hensley | 0        | 0      | 2 Oct 2021, 6:36 A.M. | 25 Sep 2021, 2:40 P.M. | <input checked="" type="checkbox"/> |
| Lois Brady      | 0        | 0      | 2 Oct 2021, 6:37 A.M. | 25 Sep 2021, 2:39 P.M. | <input checked="" type="checkbox"/> |
| Matas Orozco    | 0        | 0      | 2 Oct 2021, 6:35 A.M. | 25 Sep 2021, 2:40 P.M. | <input checked="" type="checkbox"/> |

The home screen displays a list of all clients. To create a new client, click the dark blue “New Client” button in the top right. This will take you to the “Create Client” page.

### Creating a New Client



The screenshot shows the 'Create Client' form. It has a back arrow and the title 'Create Client'. The form contains three fields: 'First name\*' with the value 'Aariz', 'Last name\*' with the value 'Manda', and 'Notes (Optional)' with the text 'Referred by Dr Shae Monroe. Aariz had a hip replacement.' At the bottom is a dark blue 'Create Client' button.

← Create Client

First name\*  
Aariz

Last name\*  
Manda

Notes (Optional)  
Referred by Dr Shae Monroe. Aariz had a hip replacement.

Create Client

Please note that both “First name” and “Last name” are required fields (must be filled in to create a new client).

“Notes” is an optional field that may contain information on the client’s referring doctor, current medical history, current referral, etc. In this example, a note was added reading “Referred by Dr Shae Monroe. Aariz had a hip replacement.”

All three fields (first name, last name, and notes) can later be viewed and edited from the client’s page.

Clicking “Create Client” will create a new client and bring us to the new client’s page:

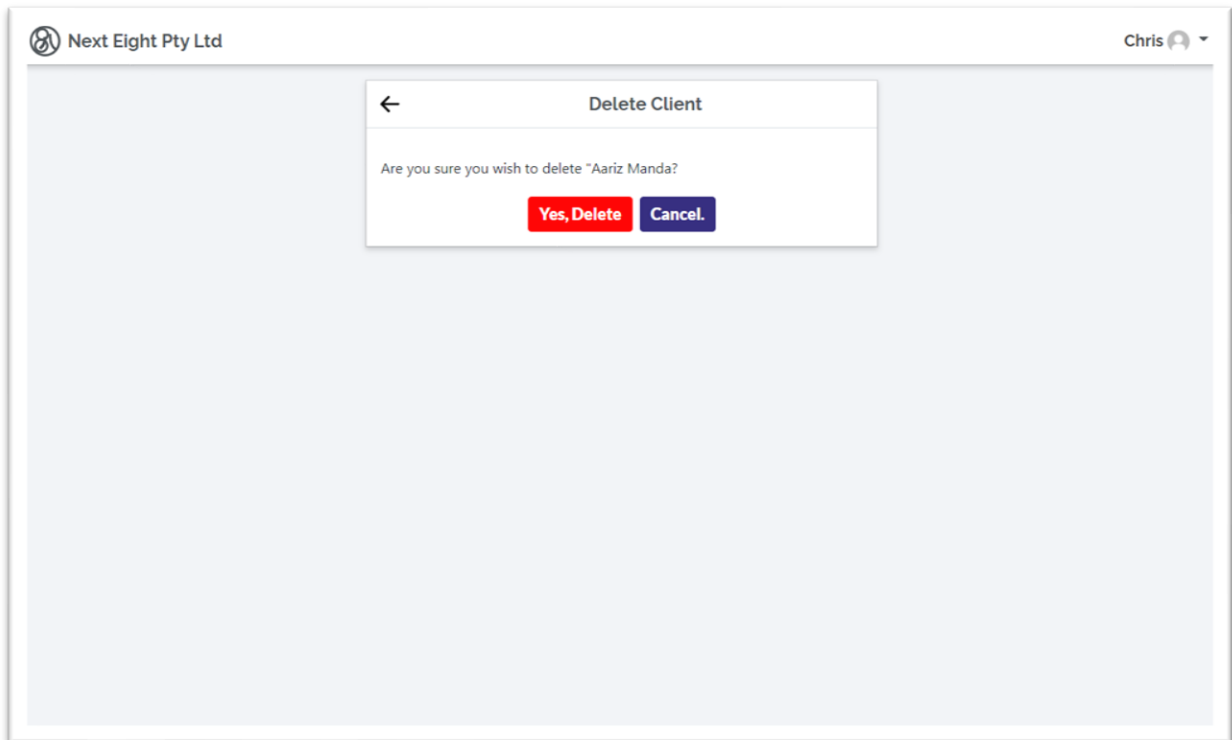
### Client Details, Editing a Client & Deleting a Client

The screenshot shows the client details page for Aariz Manda in the Next Eight Pty Ltd system. The page is divided into two main sections. On the left is a sidebar containing a back button, a profile picture placeholder, the client's name 'Aariz Manda', creation and last update timestamps (both 2 Oct 2021, 7:01 a.m.), client data (Number of Analyses: 0, Number of Videos: 0), and a note: 'Referred by Dr Shae Monroe. Aariz had a hip replacement.' At the bottom of the sidebar are 'Edit Client' and 'Delete Client' buttons. The main content area is titled 'Videos & Analyses' and features an 'Upload Video' button. Below this is a table with columns: 'Original Video', 'Pose Estimation Video', 'Analysis (PDF)', and 'Date'. The table currently contains a message: 'No Analyses To Display. Click The 'Analyse Video' Button Above To Upload And Analyse A Video.'

Clicking the “Edit Client” button will allow you to update that client’s information. The updated information will be reflected immediately in the client’s profile.

Clicking the “Delete Client” button will prompt you to confirm the deletion:

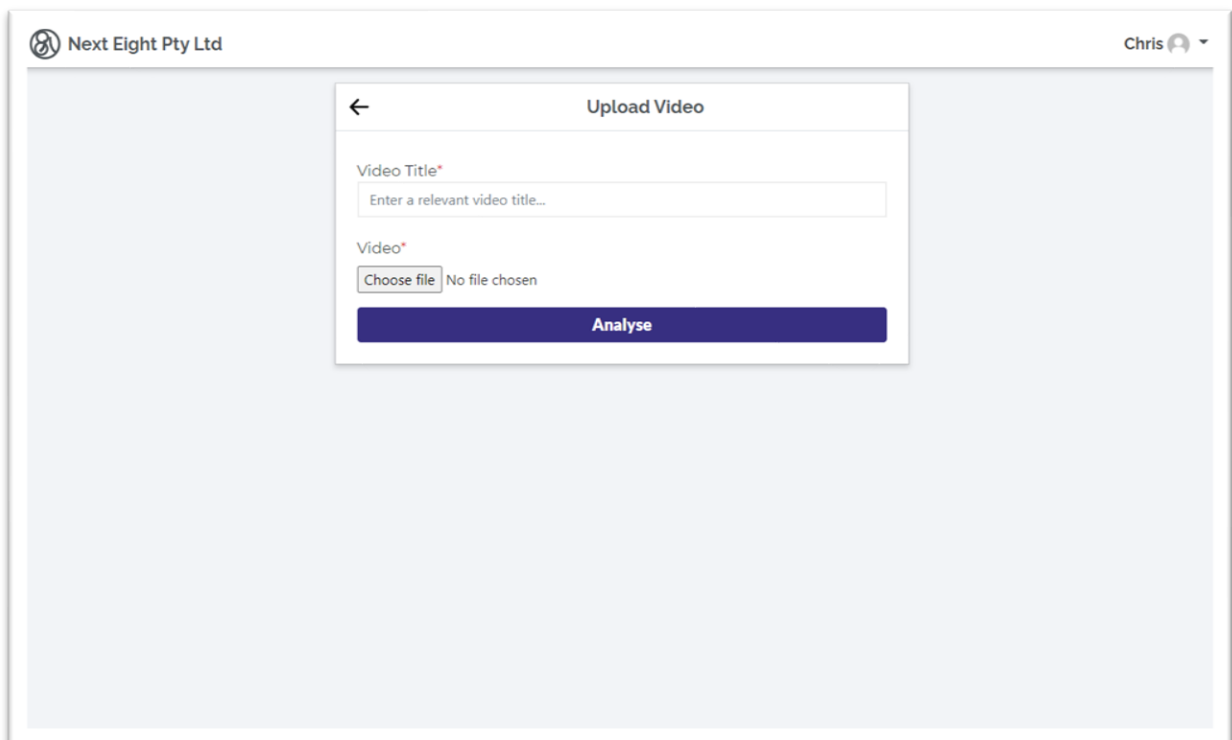




Clicking “Yes, delete.” will delete the client. Deleted clients will be removed from the database and not appear on the home screen.

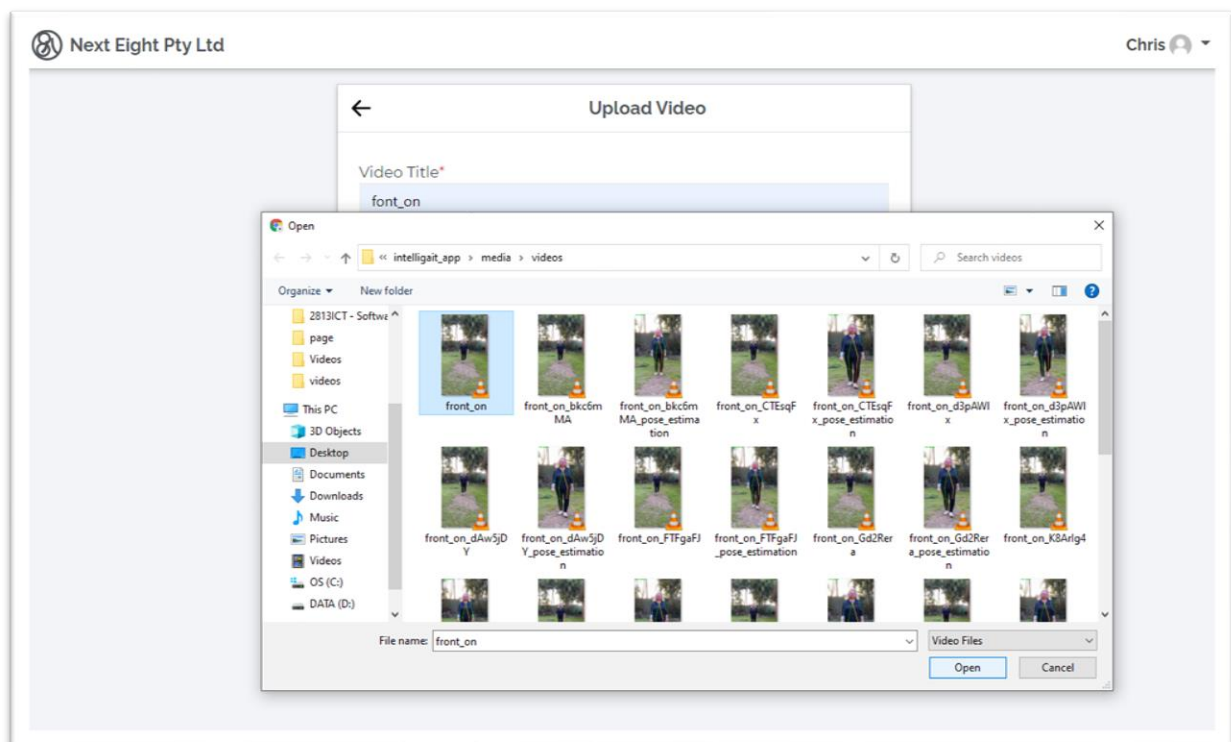
### Uploading & Analysing a Video

From the client’s user page, clicking on the “Upload Video” button will bring you to the “Upload Video” page:



Please note that both “Video Title” and “Video” are required fields to analyse a video.

Clicking the grey “Choose file” button will open file browser. Select the appropriate video and click “Open” as seen here:



Clicking the “Analyse” button will analyse the video.

Please note that analysing a short video can take up to several minutes. This analysis **will** continue to run in the background even if you leave the page. Users are **not** recommended uploading long videos (over 30 seconds).

If a video has **not** finished analysing, you will see something like this:

Next Eight Pty Ltd

Chris

Back

Aariz Manda

Created: 2 Oct 2021, 7:01 a.m.  
Last Updated: 2 Oct 2021, 7:16 a.m.

Client Data:

Number of Analyses: 1  
Number of Videos: 1

Notes:

Referred by Dr Shae Monroe. Aariz had a hip replacement.

Edit Client
Delete Client

Videos & Analyses

Upload Video

| Original Video | Pose Estimation Video   | Analysis (PDF) | Date                  |
|----------------|-------------------------|----------------|-----------------------|
| Font_on        | Font_on Pose Estimation | None           | 2 Oct 2021, 7:16 A.M. |

The Analysis (PDF) column has the value “None” because the video has not finished analysing.

If the PDF Analysis results and Pose Estimation Video (skeleton video) have not appeared, try refreshing the page. Please remember that the analysis can take a long time depending on the length of the video.

Once a video has been analysed, you will see something like this:

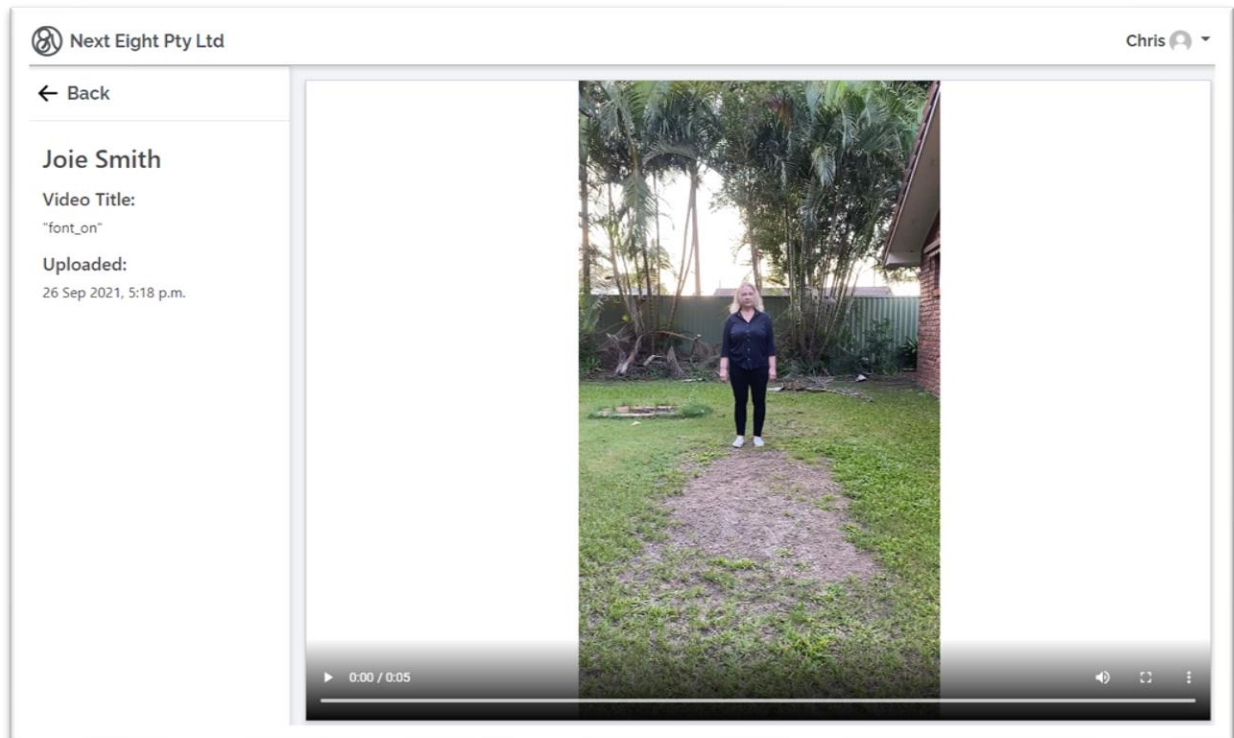
| Original Video | Pose Estimation Video   | Analysis (PDF) | Date                   |
|----------------|-------------------------|----------------|------------------------|
| Font_on        | Font_on Pose Estimation | Font_on.Pdf    | 26 Sep 2021, 5:18 P.M. |

Each row (video) contains 3 tabs linking to original video, pose estimation video, and analysis (PDF).

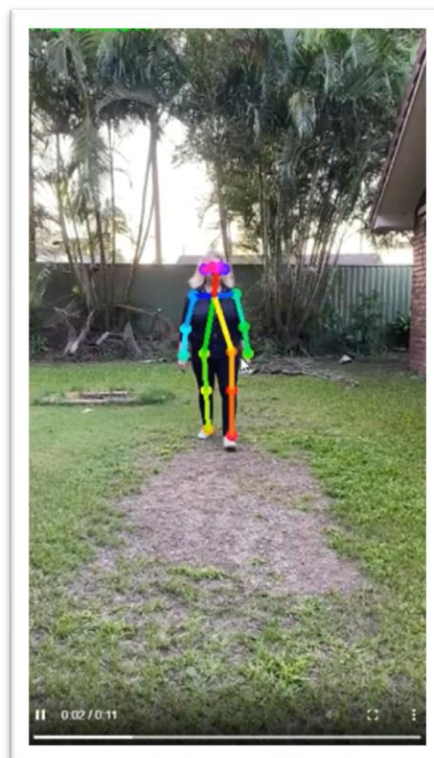
1. Original Video: clicking this tab will bring you to a video screen showing the original video.
2. Pose Estimation Video: clicking this tab will bring you to a video screen showing the skeleton video (original video with pose estimation overlayed onto it).
3. Analysis (PDF): clicking this tab will view the analysis it has created.

### Viewing an Uploaded Video

Clicking the “Original Video” will show the original video (pre-analysis).



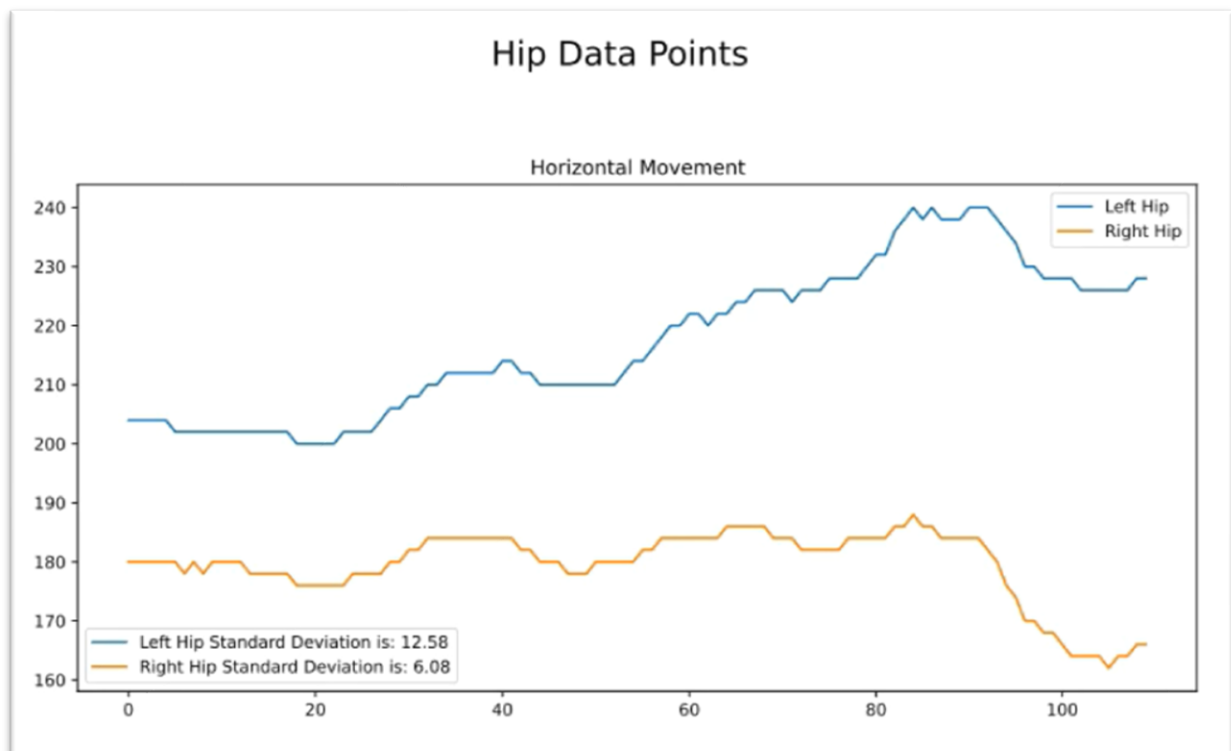
Clicking the “Pose Estimation Video” tab will show the original video with the data points it is analysing (post-analysis).



The “Pose Estimation Video” will show the original video with data points, and how each point “clicks” to each joint on the human body as they move in the video.

## Viewing a Video Analysis PDF

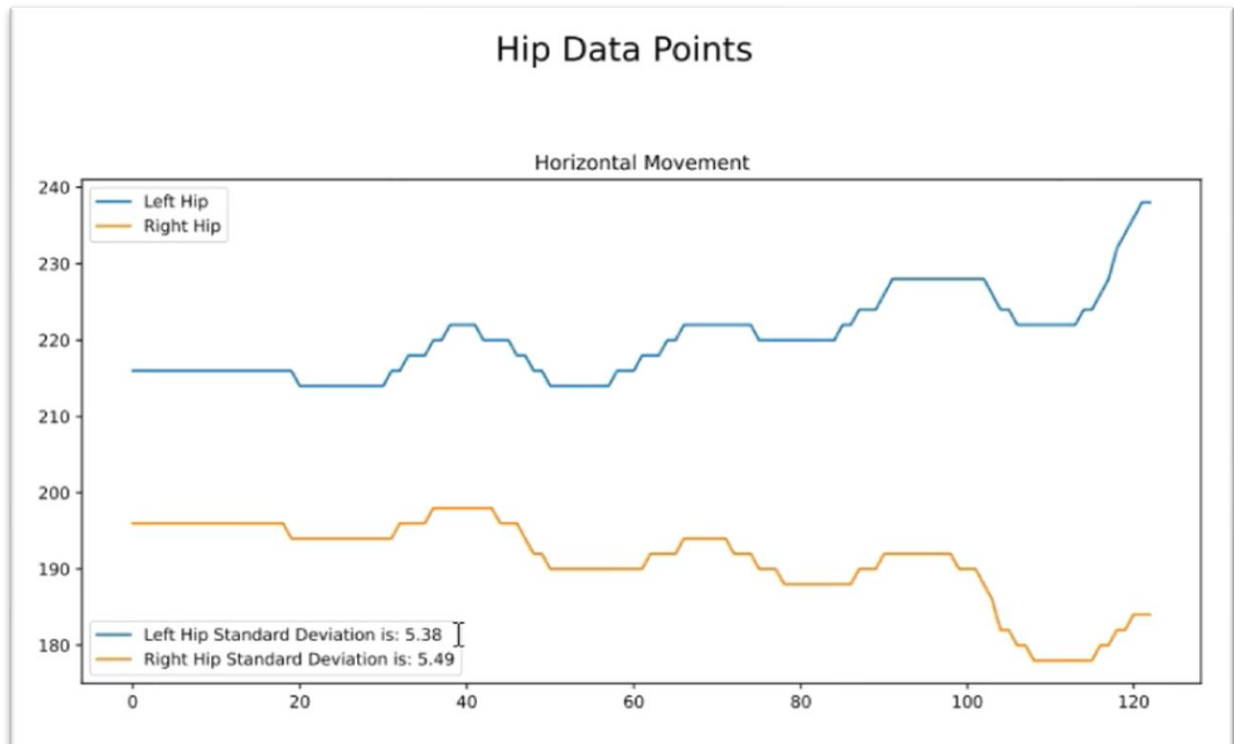
Image 1 (pre-operation):



This image shows the analysis for the patient **before** an operation on their left knee.

In this example, you can see that the Standard Deviation difference between the left (**blue**) and right (**yellow**) hip is over double. This means that as the patient walks, the left knee is moving (deviating) twice as far outwards or inwards as the right knee, indicating a problem.

Image 2 (post-operation):

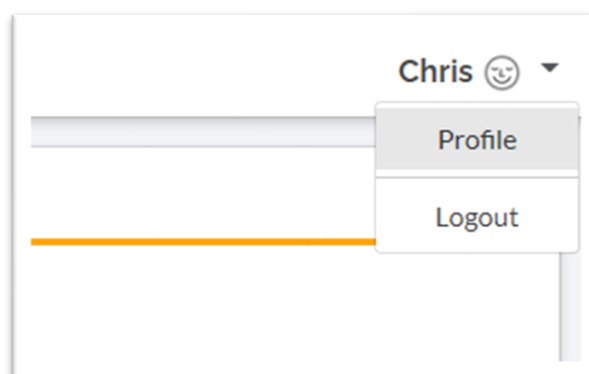


This image shows the analysis for the patient **after** an operation on their left knee (total knee replacement).

In this analysis, both are almost the same. By comparing image 1 to image 2, you can see how the program noticed the difference in the patient's gait prior to the total knee replacement and after their operation. It shows that their operation has affected the hip.

It went from almost double standard deviation (pre-op) to almost identical (post-op).

#### [Viewing & Editing Your Profile](#)




To edit your profile, click on the drop-down menu in the top-right and select "Profile". This will bring you to the "Edit Profile" screen.

Next Eight Pty Ltd

Chris

← Edit Profile

 **Chris**  
cwilde.qr@gmail.com

Username\*  
Chris

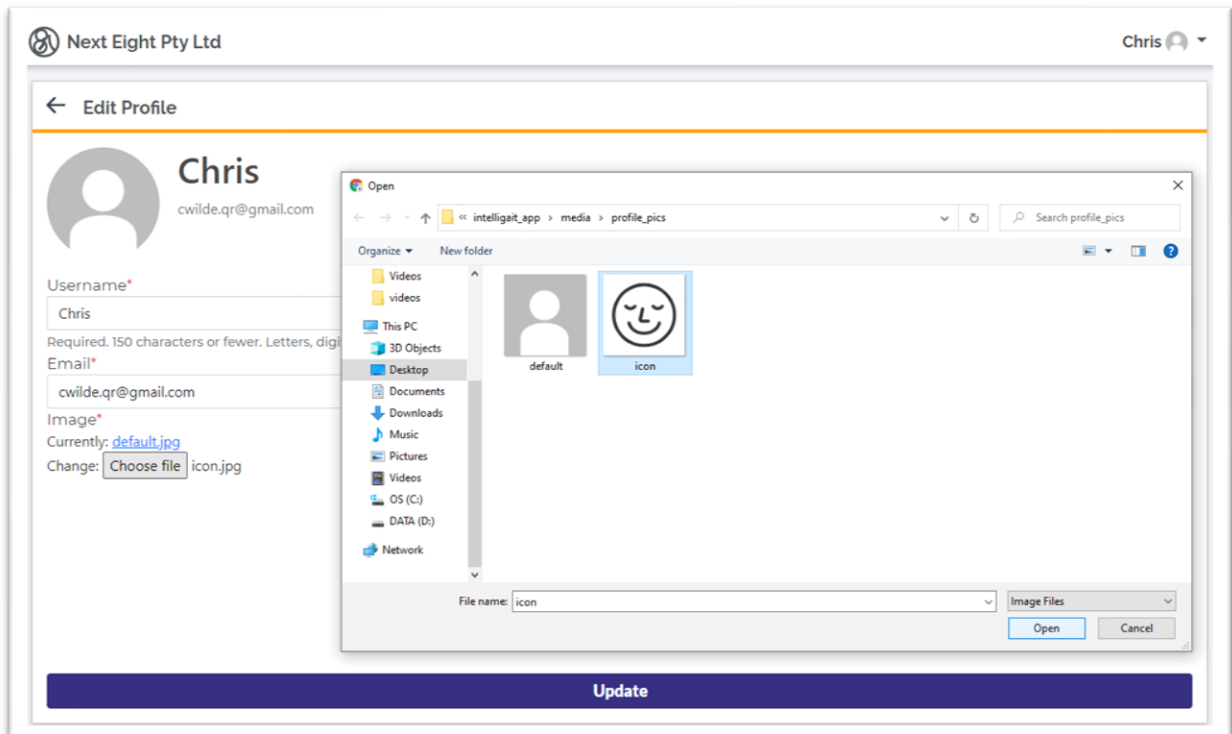
Required: 150 characters or fewer. Letters, digits and @./+/\_ only.

Email\*  
cwilde.qr@gmail.com

Image\*  
Currently: [default.jpg](#)  
Change:  No file chosen

There are 3 fields that can be altered: username, email, and profile picture.

Clicking on “Choose file” will open a file browser. You can then select an image and click “Open”, as seen here:




Please note that for changes to take effect, you must click the “Update” button.

Clicking the “Update” button will save any changes you made, and the changes will occur immediately, as seen here:

Next Eight Pty Ltd Chris ☺ ▼

← Edit Profile



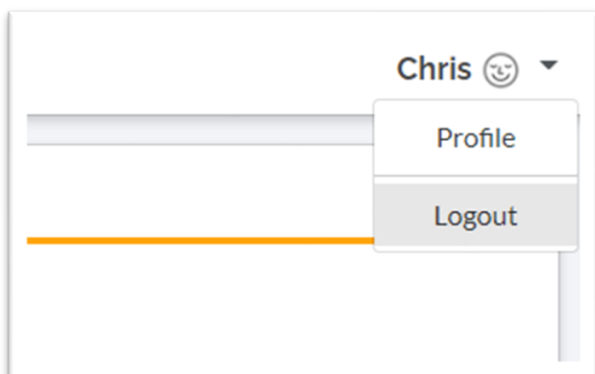
**Chris**  
cwilde.qr@gmail.com

Username\*  
  
Required. 150 characters or fewer. Letters, digits and @./+/\_ only.

Email\*

Image\*  
Currently: [profile\\_pics/icon\\_7EULYw0.jpg](#)  
Change:  No file chosen

## How to Logout



To log out, click on the drop-down menu in the top-right and select “Logout”. This will bring you to the logout screen:



## Logout

You have been logged out.

[Login?](#)

[Register](#)

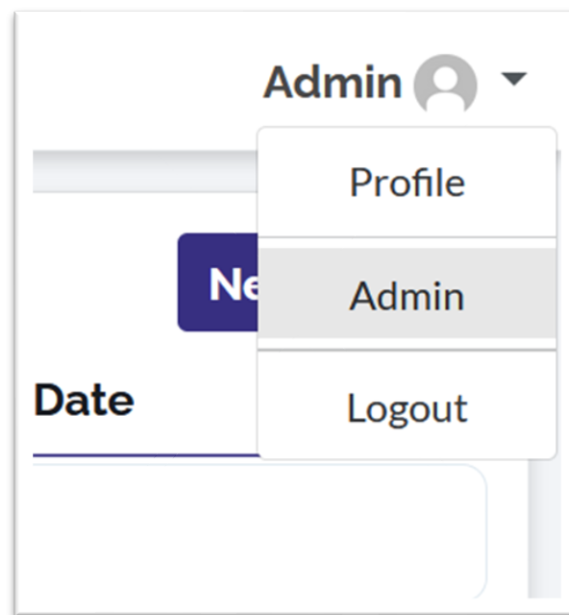
## System Administration & Maintenance

To access the admin part of the application, you must sign into the admin account with the following details:

Username: admin

Password: xJ+m4dFy\_m

This password should be changed (see [Changing User Passwords](#) section for details). Once signed in, to access the admin page, click on the dropdown menu in the top right and select "Admin".

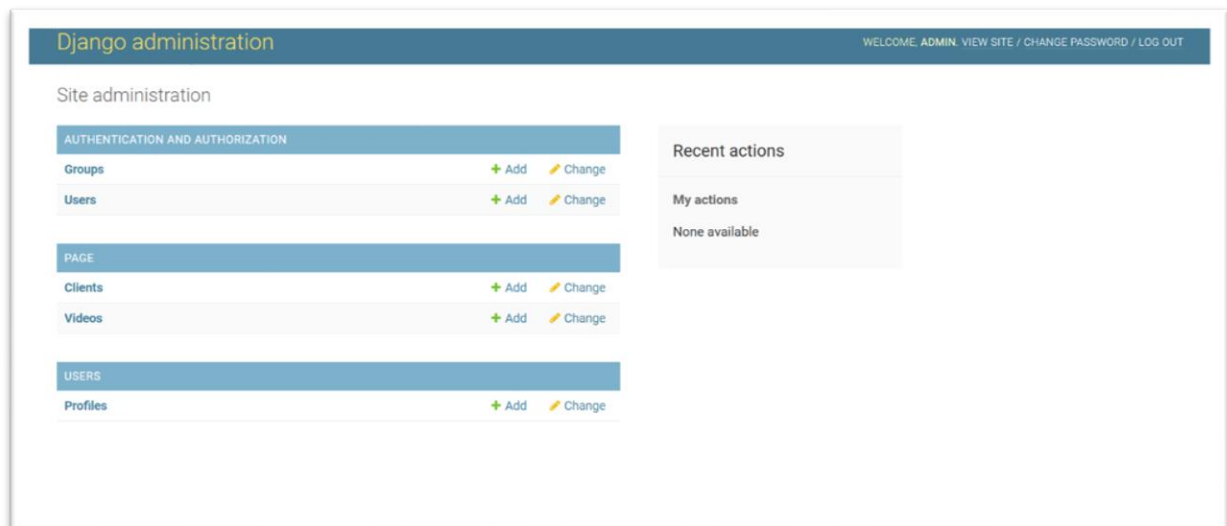


### Changing User Details & Permissions

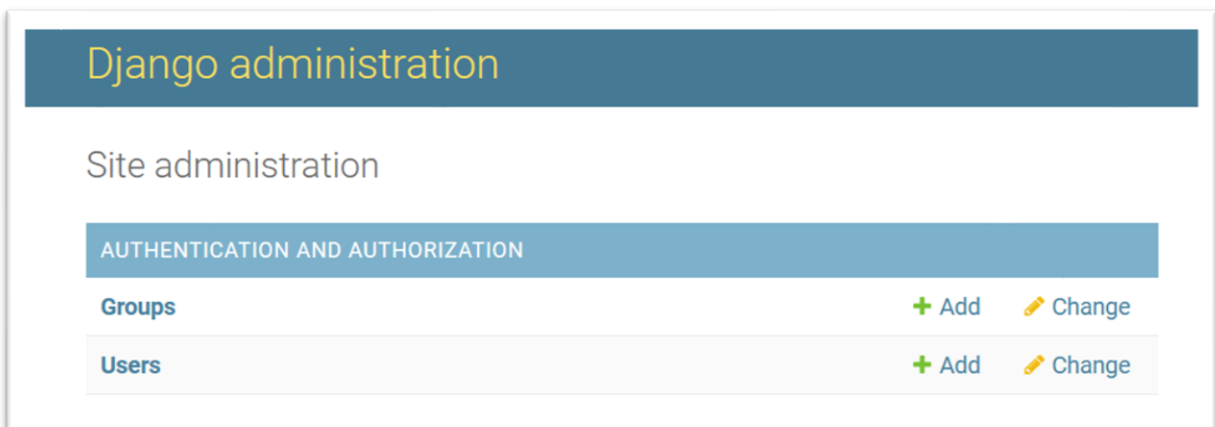
On this page you can access information about all the users of the application. This includes the users first name, last name, email address, and permissions. You will not be able to see their password. The permission levels are "Active", "Staff status", and "Superuser status". When a user signs up to a new account, their permissions are set to the lowest possible setting, "Active".

The "Active" and "Staff status" allows the user to access the normal web application, they will not be able to access the admin pages. Only users with "Superuser status" can view the admin pages. "Staff status" can be used in the future once the application is available to the public or physiotherapy clients to separate staff users and client users. However, this is not a feature of the current version of the application.

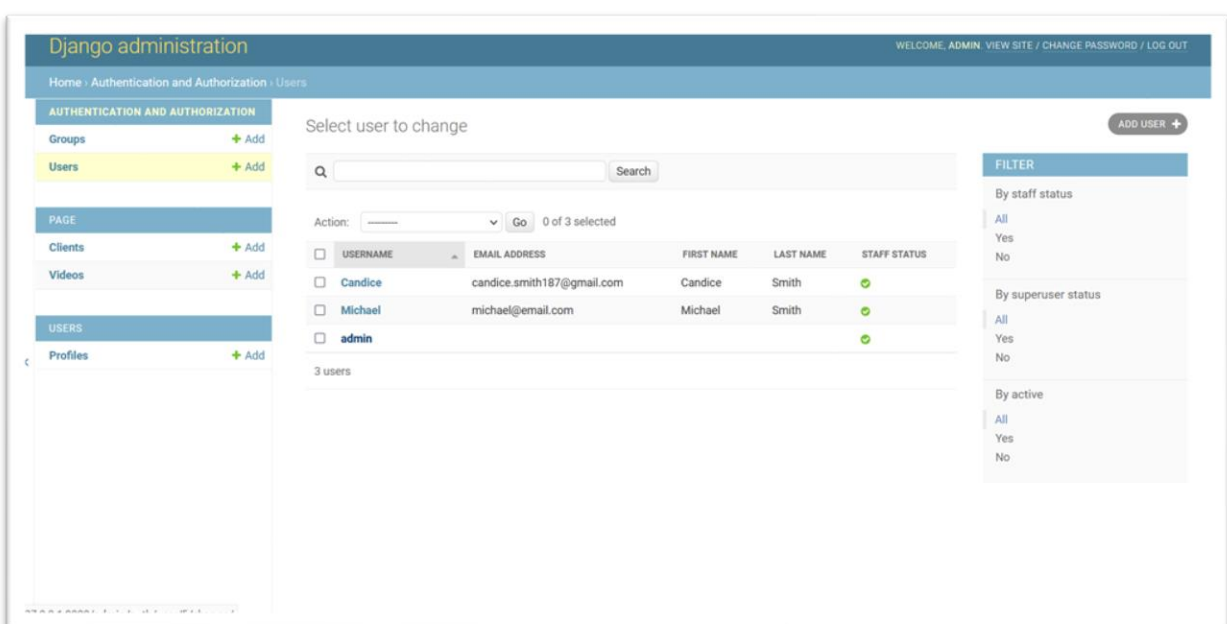
Below is the main screen of the admin page.



If you wish to change a user's permission status, this is done by clicking the "Users" link under "Authentication and Authorization".



Then select the user you want to change.



This takes you to the page for that user. This displays their details, and they can be updated.

**Change user**

**admin**

**Username:**   
Required: 150 characters or fewer. Letters, digits and @/./+/-/\_ only.

**Password:** **algorithm: pbkdf2\_sha256 iterations: 260000 salt: VhY6qN\*\*\*\*\* hash: nLjhFY\*\*\*\*\***  
Raw passwords are not stored, so there is no way to see this user's password, but you can change the password using this form.

**Personal info**

**First name:**

**Last name:**

**Email address:**

**Permissions**

- ☒ **Active**  
Designates whether this user should be treated as active. Unselect this instead of deleting accounts.
- ☒ **Staff status**  
Designates whether the user can log into this admin site.
- ☒ **Superuser status**  
Designates that this user has all permissions without explicitly assigning them.

Once any changes have been made, you must click save at the bottom right of the screen to save all changes.

**Important dates**

**Last login:** **Date:**  Today   
**Time:**  Now

**Date joined:** **Date:**  Today   
**Time:**  Now

**Delete** **Save and add another** **Save and continue editing** **SAVE**

## Changing User Passwords

There is no way for a user to change their password within the application. The only way to change a specific user's password is to change it through the admin page. This can be done by clicking on the user as shown above and clicking the link under Password, shown below.

**Password:** **algorithm: pbkdf2\_sha256 iterations: 260000 salt: VhY6qN\*\*\*\*\* hash: nLjhFY\*\*\*\*\***  
Raw passwords are not stored, so there is no way to see this user's password, but you can change the password using [this form](#).

This will take you to the Change Password form for that user.

## Change password: admin

Enter a new password for the user **admin**.

**Password:**

Your password can't be too similar to your other personal information.

Your password must contain at least 8 characters.

Your password can't be a commonly used password.

Your password can't be entirely numeric.

**Password (again):**

Enter the same password as before, for verification.

CHANGE PASSWORD