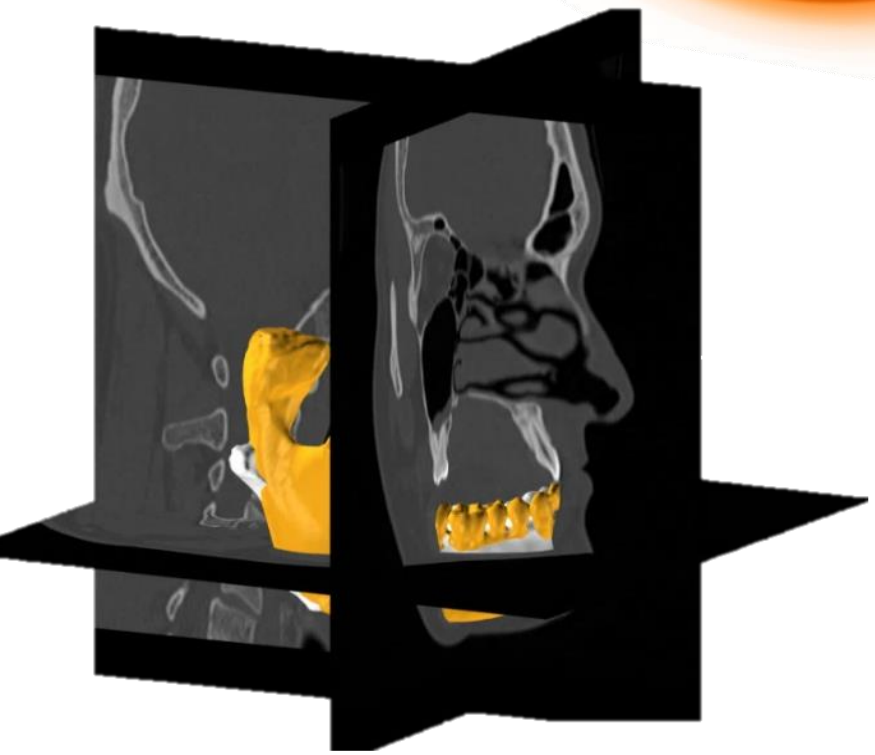
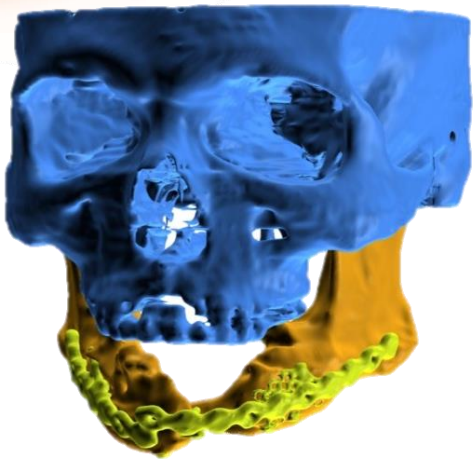
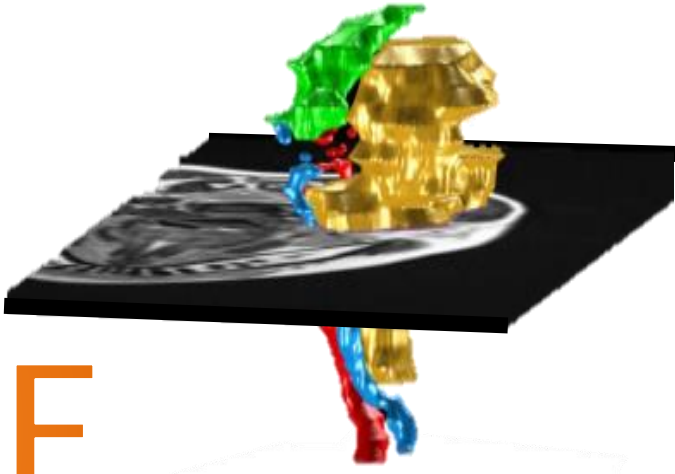
STEROVIZ® PIXELS







ENHANCE *LITE*

User Manual

Version ~~1.2~~ 1.3

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Terms of Use:

This user manual is provided by Steroviz Pixels Pvt. Ltd. and is exclusive to *ENHANCE Lite*, a software application product that is wholly owned and proprietary to Steroviz Pixels Pvt. Ltd. *ENHANCE Lite* should be used for informational purposes only. ~~Detailed terms and conditions related to the information contained in this document can be found in the Customer Service Agreement with the user of *ENHANCE Lite*.~~

Indications for Use:

This user manual provides instructions to the user on how to utilize the *ENHANCE Lite* software application to visualize and analyze anatomical information derived from a pre-operative CT or MRI scan of the patient, and is intended to assist the surgeon with reference information related to anatomical structures.

Medical and Product Information:

Steroviz Pixels Pvt. Ltd. is a service provider for surgical planning services, does not practice medicine and does not recommend any specific surgical technique for use on a particular patient. Steroviz Pixels Pvt. Ltd. is not responsible for the selection of the appropriate surgical technique in the case of an individual patient. This user manual is for informational purposes only and is not intended as medical advice or substitute for medical advice.

Governing Law:

Any legal action or proceeding related to this user manual or the information contained in it shall be construed in accordance with the laws of the State of West Bengal, India, without regard to conflicts of laws principles, and brought exclusively in a court in Kolkata, West Bengal, India.

Disclaimer:

~~By acceptance of the terms and conditions described in the Customer Service Agreement~~ regarding the usage of *ENHANCE Lite*, the surgeon is hereby validating and accepting all pre-operative anatomical planning that was performed to enable visualization and analysis of anatomical information in the *ENHANCE Lite* platform.

Note:

1. Steroviz case number for each anatomical dataset will be saved within each *ENHANCE Lite* file.
2. All anatomical measurements will be in millimetres, rounded up to 1st decimal point.
3. All angles will be rounded up to the nearest degree.

Computer System Requirements:

ENHANCE Lite has been developed and tested to be operated on personal computer and workstations running Microsoft Windows operating system. This application software is not compatible with Mac or Linux operating system. This application software is not compatible with mobile phone systems running on either Android or iOS. Below are the recommended and minimum computer system specifications required for *ENHANCE Lite* to be operated as per its intended use.

A. Recommended system specifications:
CPU - Intel Quad core 2.5 GHz or higher; AMD Quad core 3 GHz or higher.
Operating system - Windows 11 or higher
RAM - 16 GB or higher
Hard drive space - free 15 GB or higher
Graphics - 2 GB or higher
Monitor - resolution 1080p or higher; size 17 inch or higher

B. Minimum system specifications:
CPU - Intel Quad core 2 GHz; AMD Quad core 2.5 GHz.
Operating system - Windows 10
RAM - 8 GB
Hard drive space - free 10 GB
Graphics - 512 MB
Monitor - resolution 1080p; size 13 inch

User Manual

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1. USER INTERFACE

1.1 FILE MENU

1.1.1 NEW [CTRL+N]

Opens a new Enhance Lite session.

1.1.2 LOAD DATA [CTRL+O]

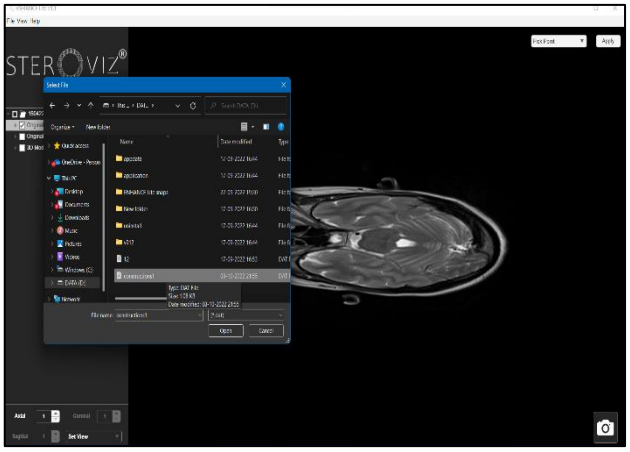
Loads the folder containing various original and processed patient data. The following types of data can be imported into ENHANCE Lite:

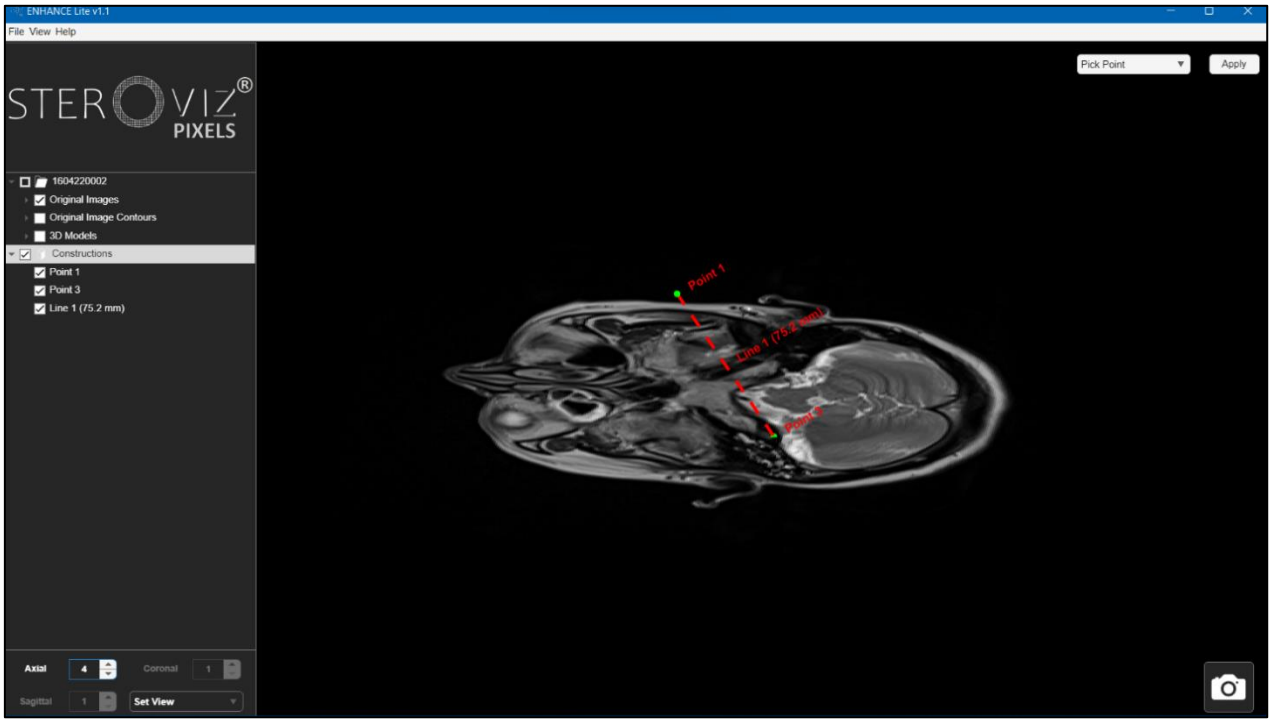
I. **Original Images** – The original image data of patients in .dat format.
II. **Original Image Contours** – Boundaries or contours of the region of interest/anatomy of interest imported from .dat files.
III. **Derived Images** – Derived images generated by arbitrary slicing of image stack across any plane, imported as .dat files.
IV. **Derived Image Contours** – Boundaries or contours of regions of interest constructed on any derived image (if done), imported as .dat files.
V. **3D Models** – The 3D reconstructed anatomy obtained after processing or any custom-made CAD model, imported as .enhx files.

Once imported into *ENHANCE Lite*, select the checkboxes in the layered tree to view each feature. Deselect to hide.

1.1.3 LOAD CONSTRUCTIONS

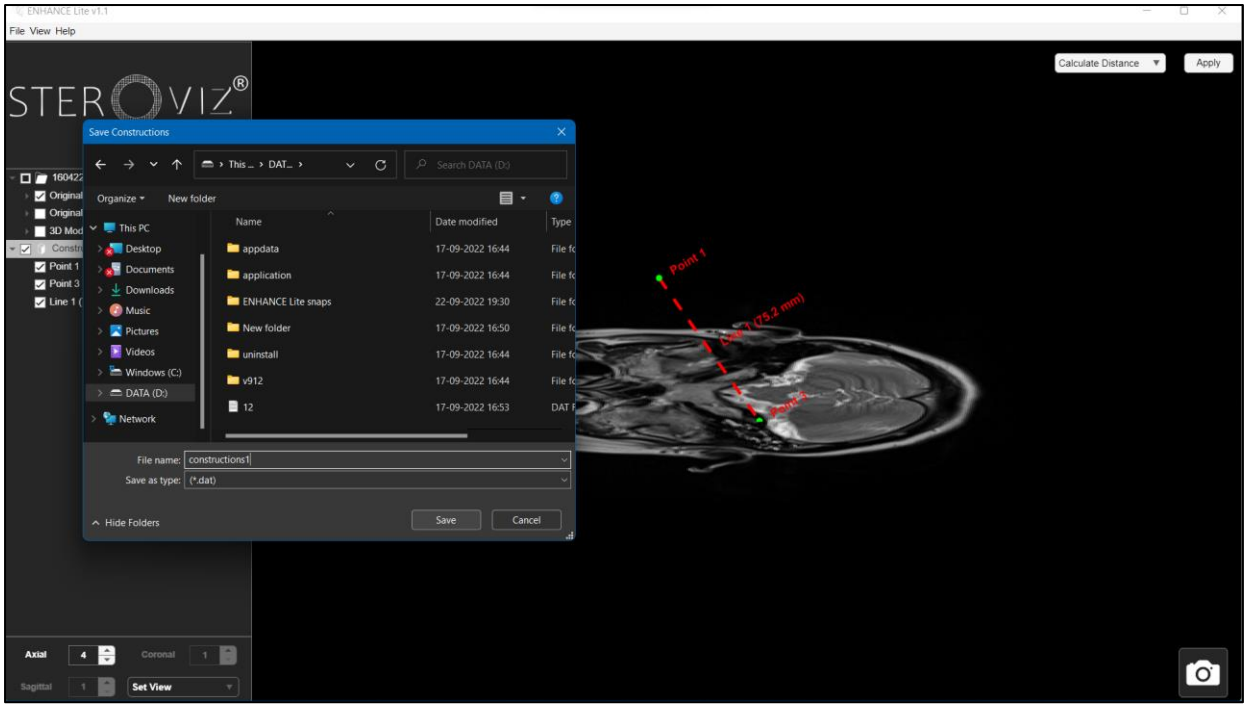
Clicking on this tab loads all previously created points, lines and planes from pre-existing ENHANCE Lite sessions, if required for future reference.





1.1.4 EXPORT CONSTRUCTIONS

Saves constructions as created in the current *ENHANCE Lite* session. Points, lines, distances, and planes are saved in a .dat file.



1.1.5 EXIT [CTRL+Q]

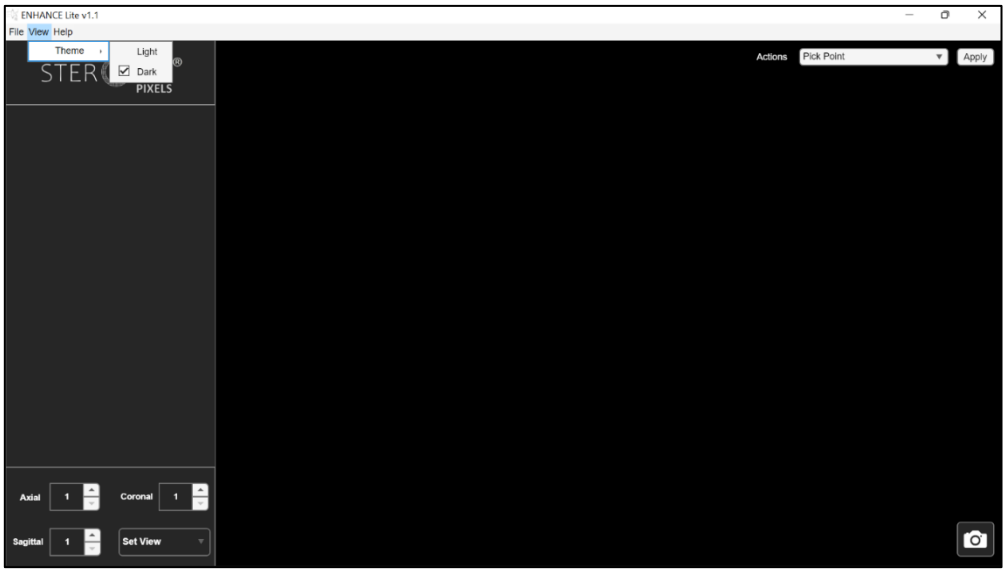
Closes the current *ENHANCE Lite* session. Does not save any created construction.

1.2 VIEW TAB

The view tab consists of two options which can change the theme of the interface depending on the user's preference.

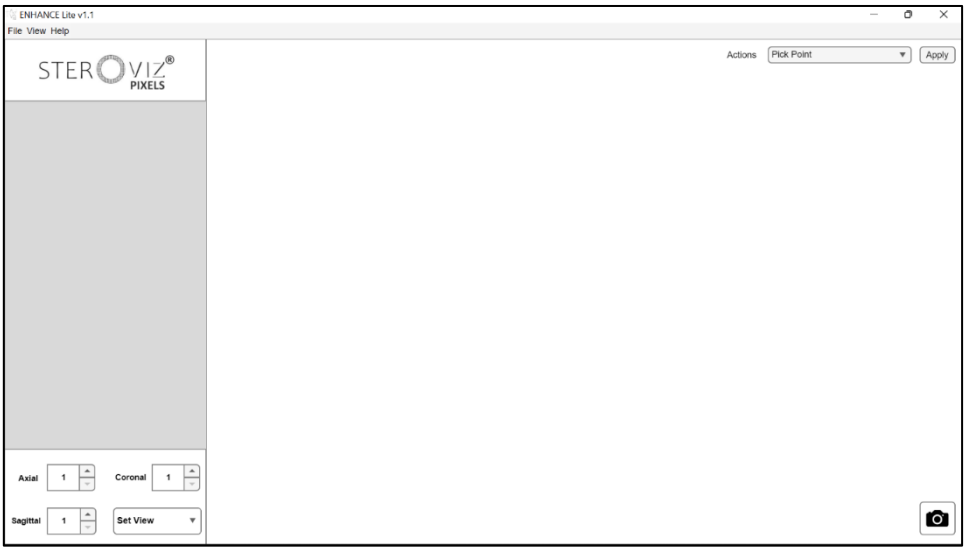
1.2.1 DARK MODE

The app is set to a default dark mode where the background is black.



1.2.2. LIGHT MODE

If the user prefers to use a lighter background, selecting this option will convert the background from black to white.

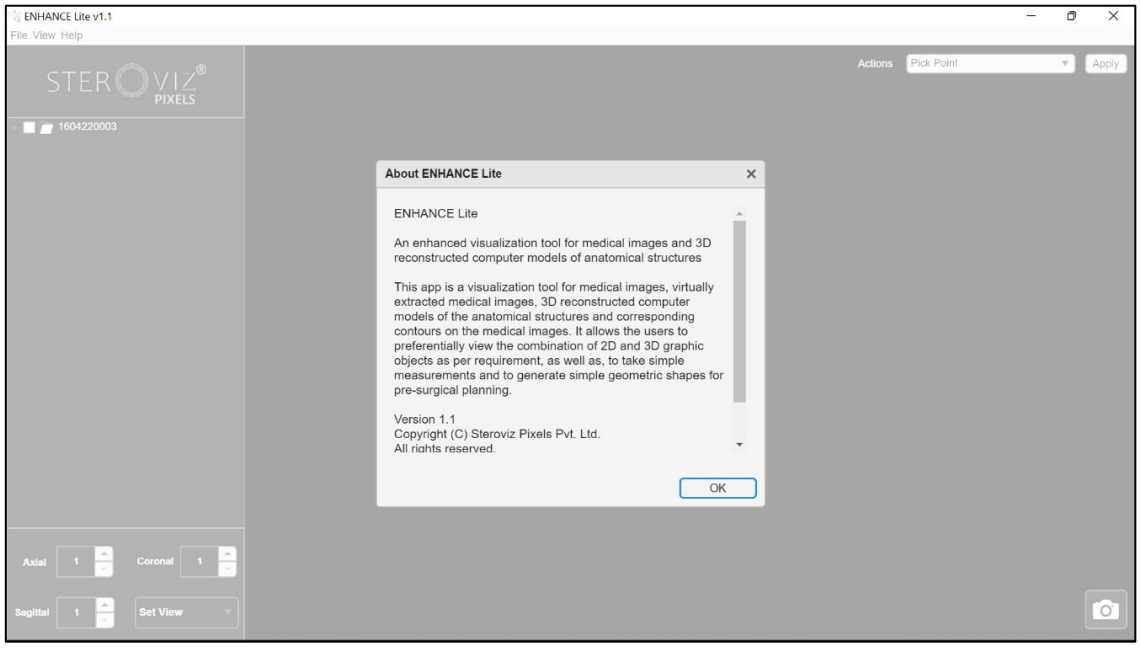


1.3 HELP MENU

The Help Menu consists of two options. Each option serves the purpose of improving the user's usability and understanding of *ENHANCED Lite.*

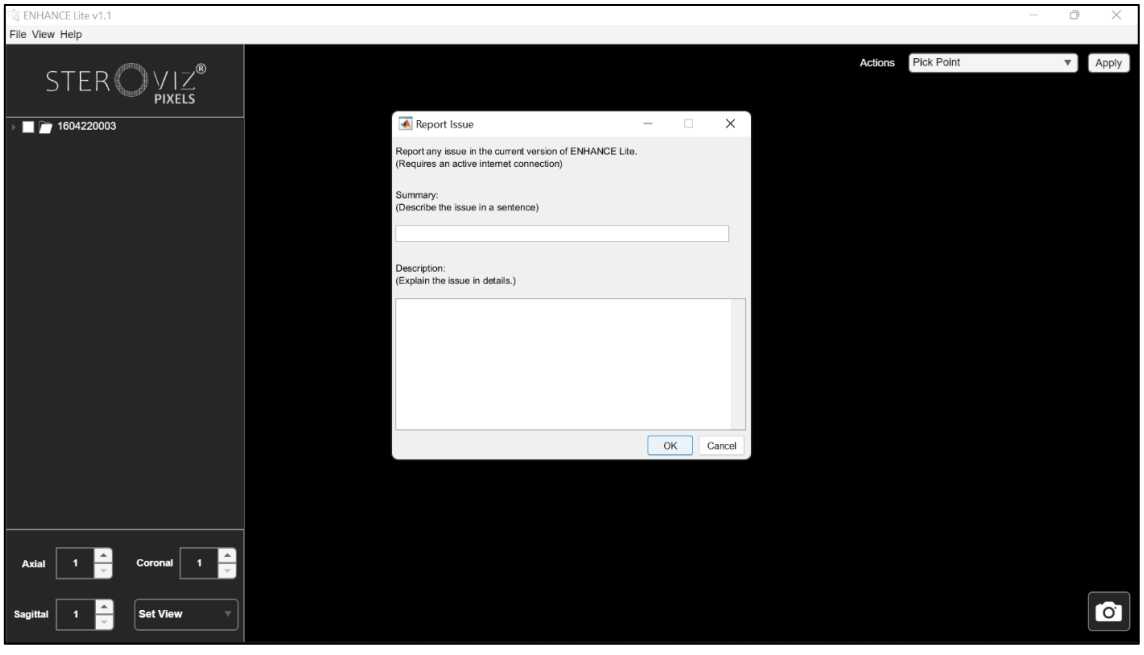
1.3.1 ABOUT *ENHANCE Lite*

Clicking on this opens a window briefly highlighting the functions and capabilities of *ENHANCE Lite.*



1.3.2 REPORT AN ISSUE

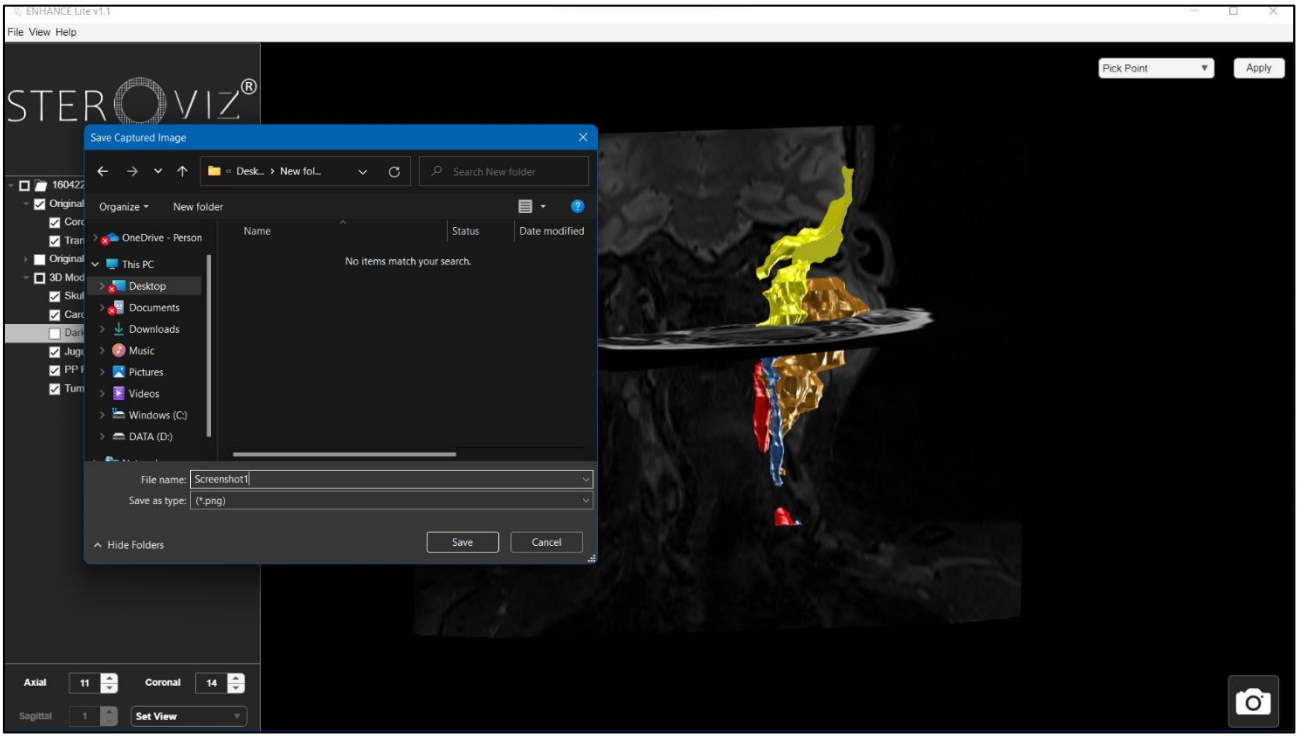
Clicking on this opens a window enabling the user to directly send a report of any in-app issues that may arise while using it. The window provides prompts in which the user may describe the issue, and click OK to send it.



2. APP INTERACTIONS

2.1 SNAPSHOT

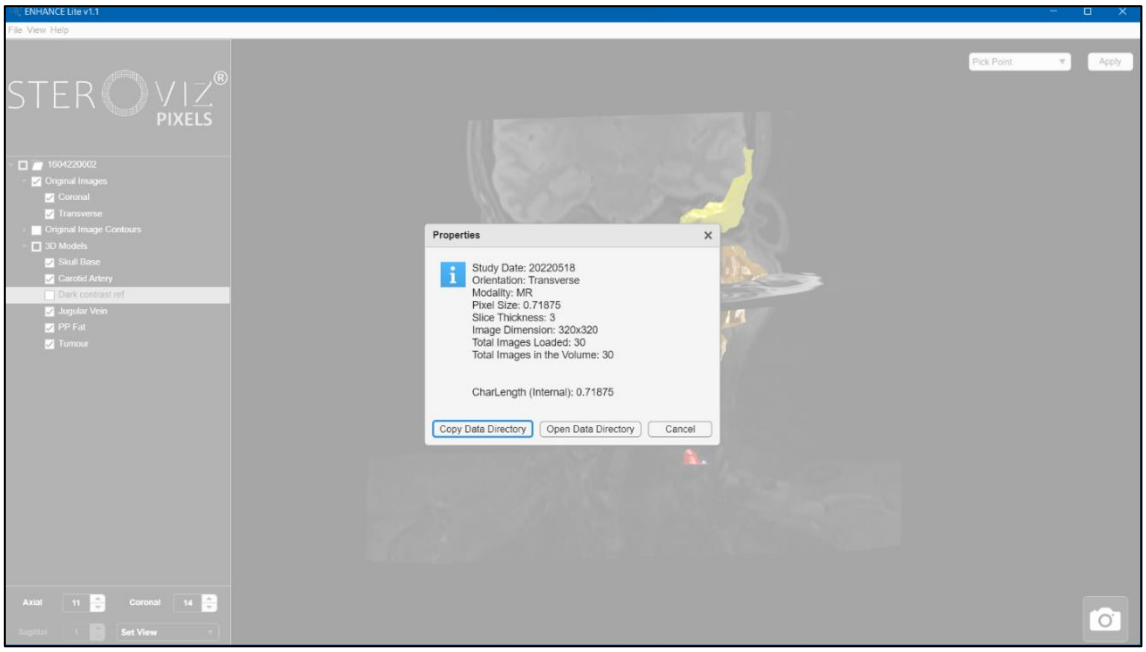
The lower right corner of the screen contains a **camera icon**. Clicking on this icon results in a **snapshot of the entire *ENHANCE Lite* window to be captured in its current state**. To capture a snap, click this icon. Doing so opens the file explorer. Here the **file can be saved in a .png format**, for any future reference/utility. Name the image as required, and click save. The snapshot will be saved in the chosen location.



2.2 LAYERED TREE INTERACTIONS

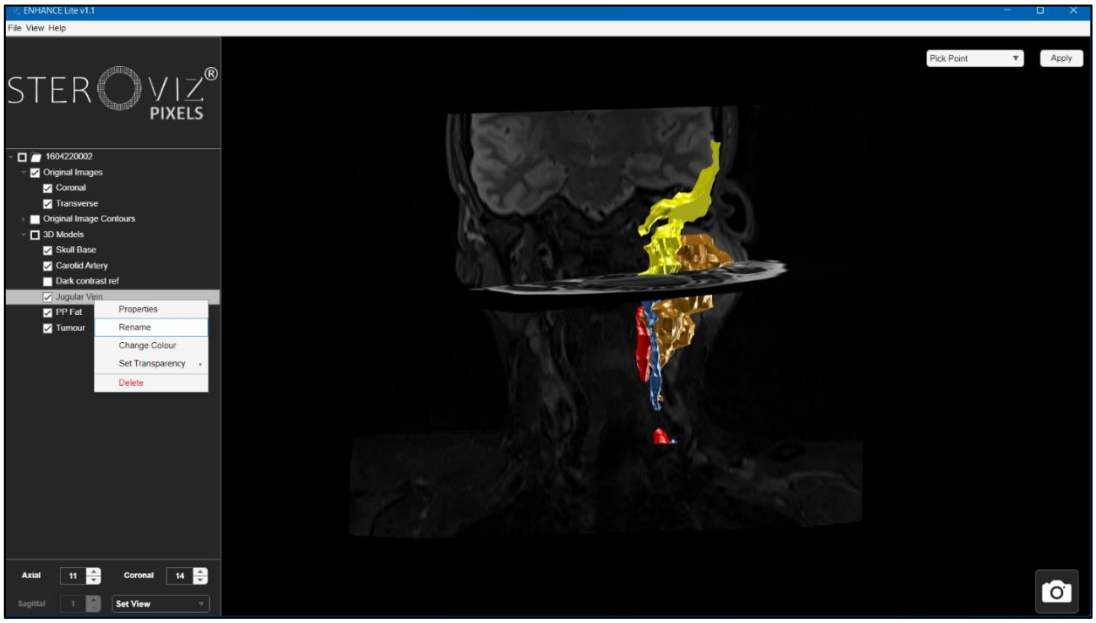
2.2.1 PROPERTIES OF ORIGINAL IMAGES

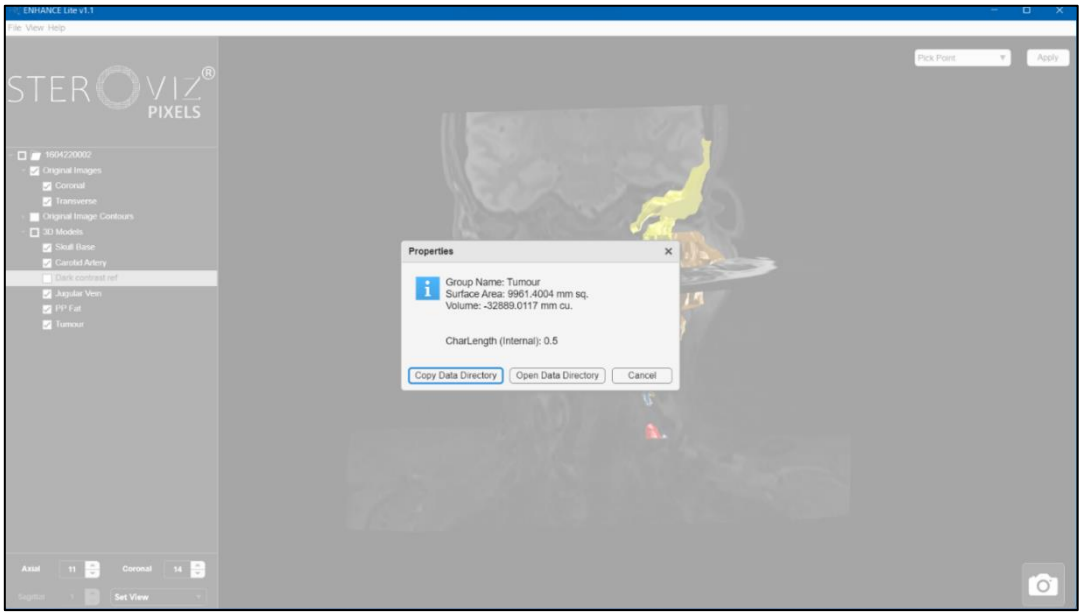
Right clicking on any loaded original image set in the layered tree shows ‘Properties’ as an option. Click on this to know about the salient properties of the loaded data, including orientation, imaging modality, pixel size, slice thickness etc., as shown below.



2.2.2 PROPERTIES OF 3D MODELS

Right clicking on any 3D feature in the layered tree provides several options, as shown below.

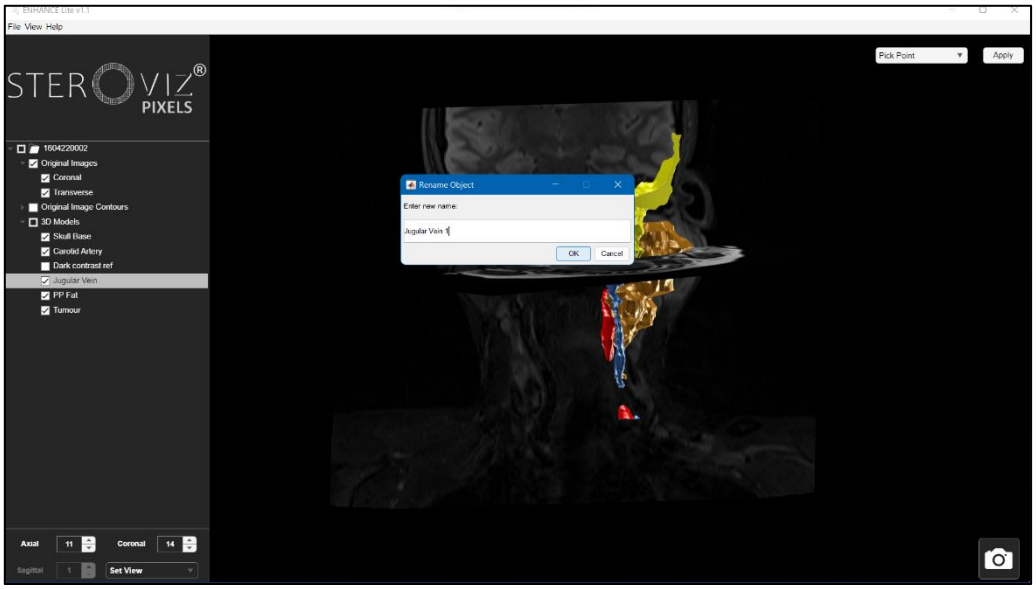




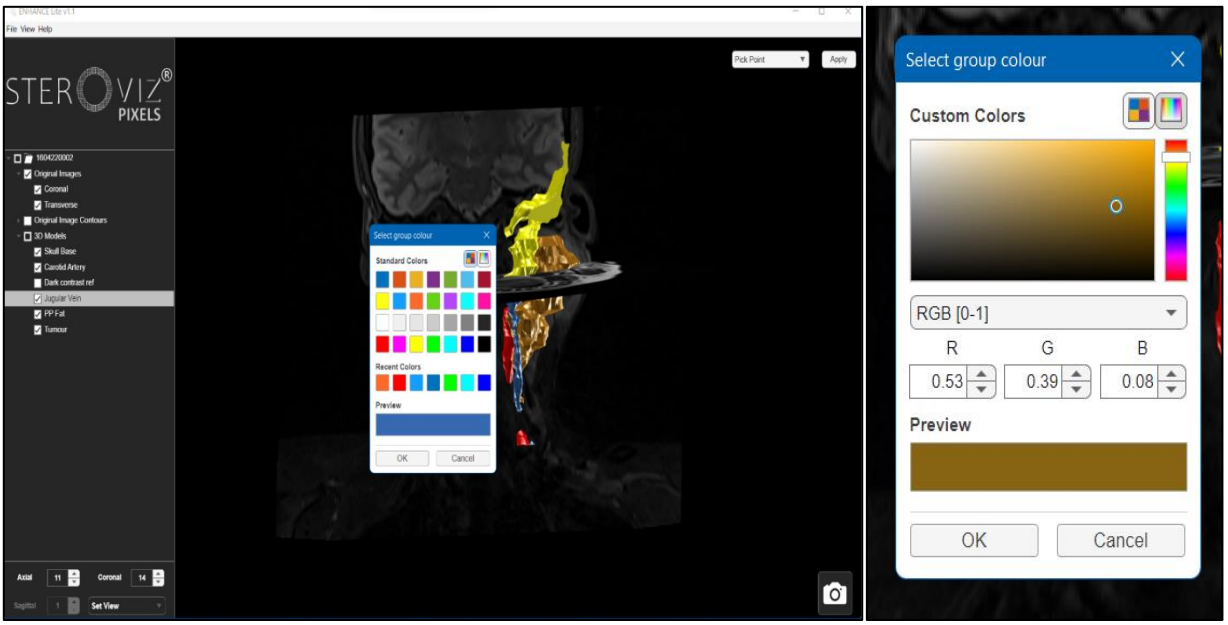
Click on 'Properties' in order to view properties of the loaded 3D models including volume and surface area of the selected model, as shown below.

2.2.3 RENAME AND CHANGE COLOUR

Click on ‘Rename’ in order to change the name of any model or construction (see section 3) as per requirements. A window containing an entry box pops up. Type in the desired name and click ‘OK.’

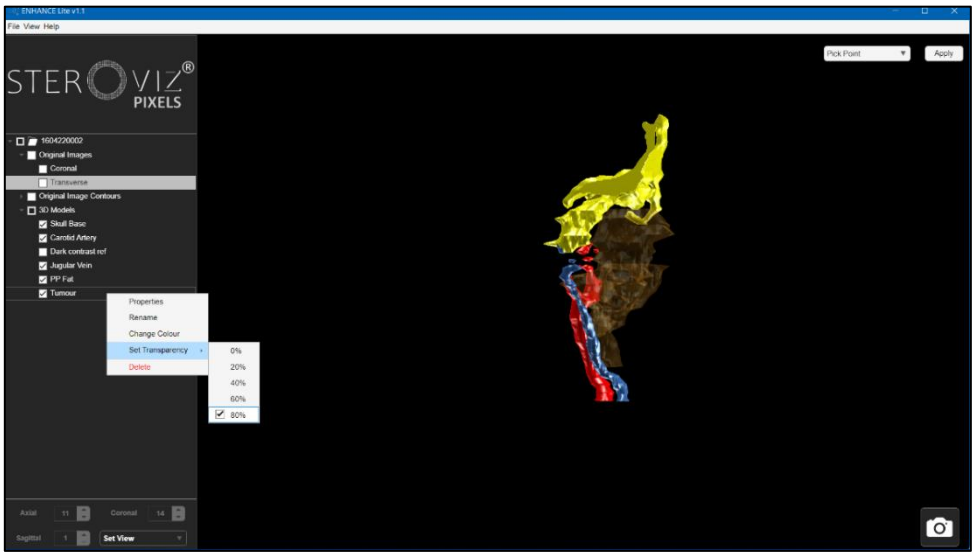


Click on ‘Change Colour’ to alter the colour of any model or construction (see...) for better visualization or ease of analysis. Select the desired colour from the pop-up window and click ‘OK’. For more colour variations, click on the small icon on the upper right of the pop-up window. This opens a colour slider tool, from which a wider variety of colours can be selected.



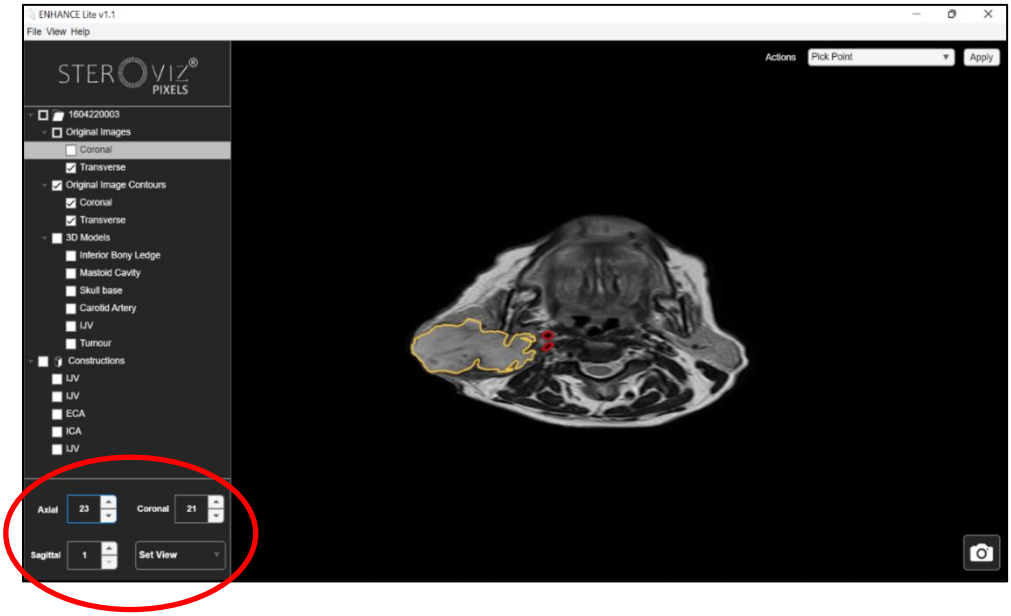
2.2.4. SET TRANSPARENCY

The transparency of any 3D model can be adjusted from the drop-down menu that opens up once you click on 'Set Transparency', as shown below. Click on desired transparency level, and the model changes automatically.



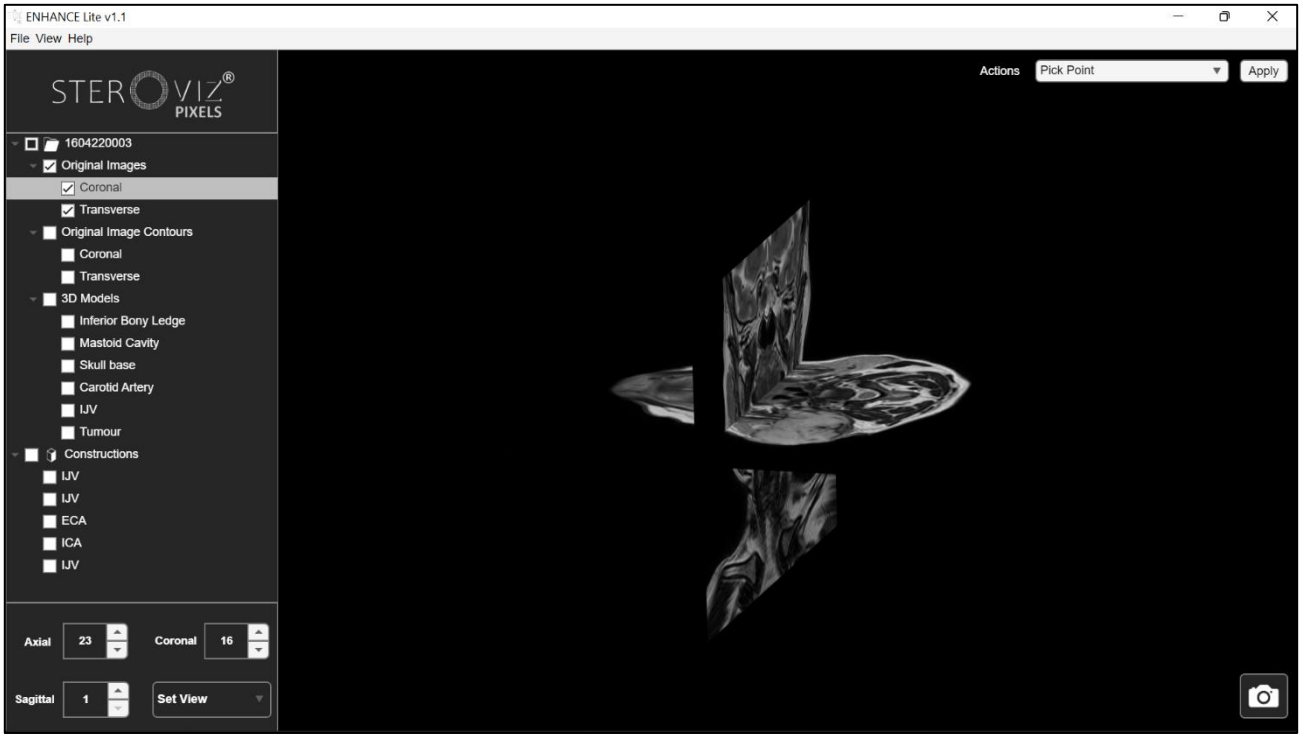
2.3 ORIENTATION AND IMAGE VIEWS

On the bottom left-hand corner of the app screen, there are several buttons and options which enable the user to navigate through different slices of scans of any orientation and also between different anatomical views.

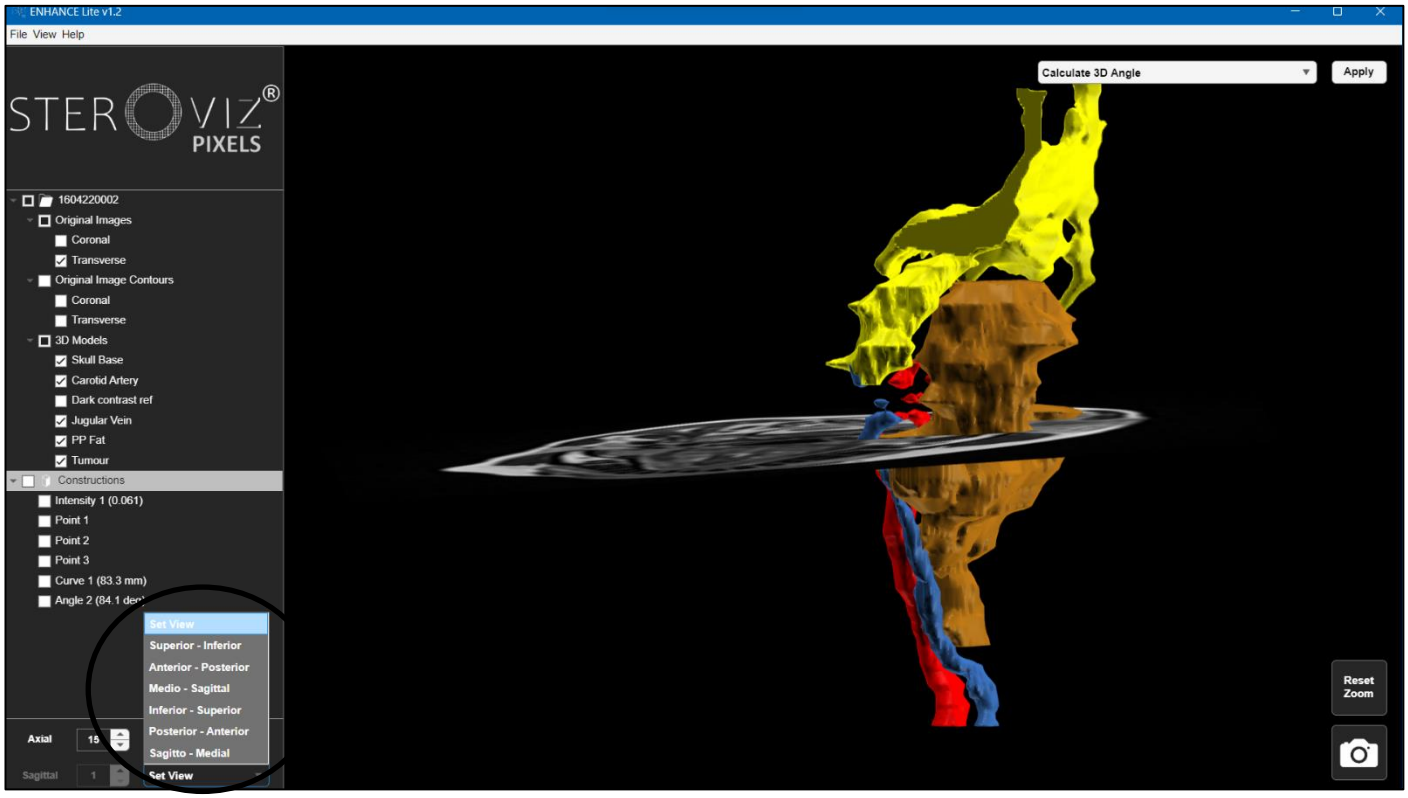


- Click on the up and down arrow buttons next to Axial, Coronal and Sagittal to move through the respective images in the scan. All scan orientations can be viewed together.

- Clicking on the arrow buttons will show the corresponding number of the slice currently being viewed on the main screen.



To set a particular view, click on ‘Set View’. This opens a drop-down menu consisting of three main anatomical views. Click on any view to automatically re-orient the loaded data to the desired view.



2.4 ROTATION AND ZOOM

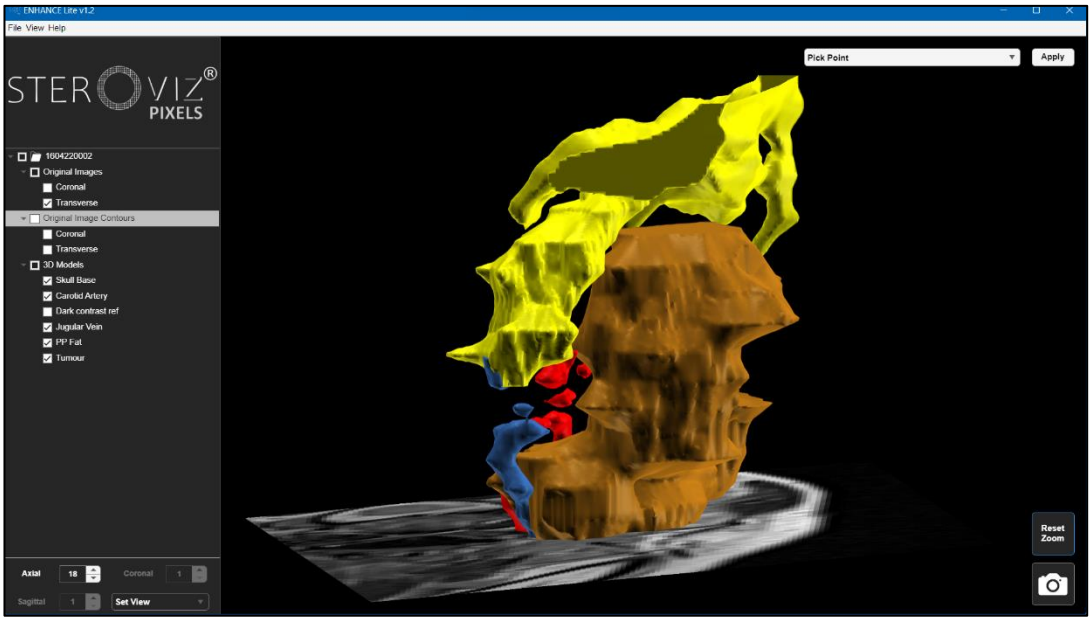
2.4.1 ROTATION

In order to rotate the images and models viewed on screen, **click, and hold any button on your mouse, or any point on out laptop touchpad, and rotate as desired**.

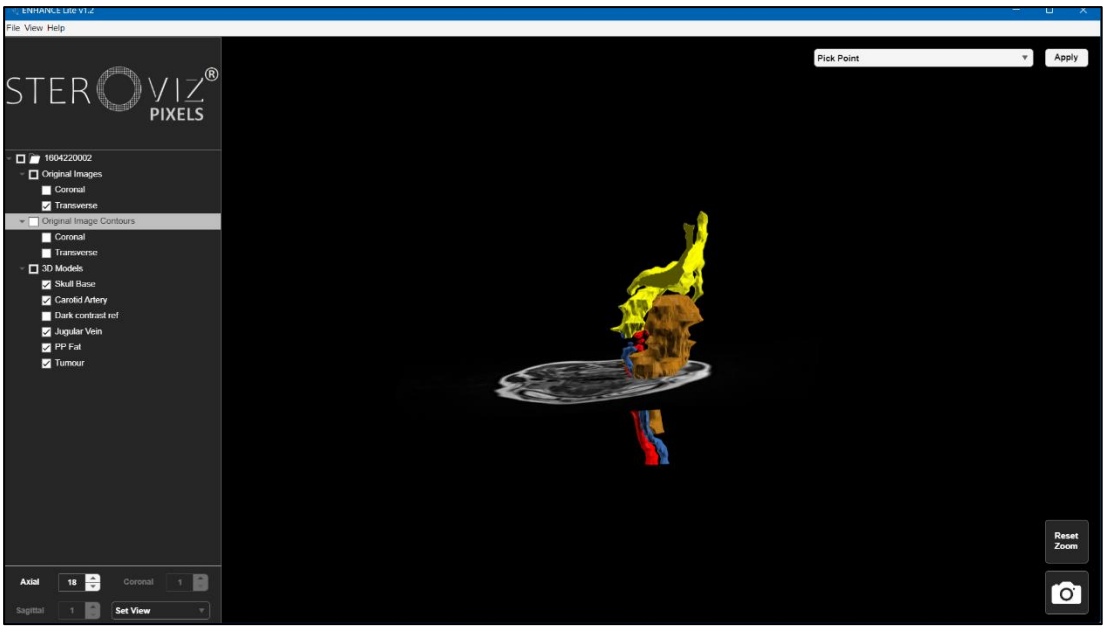
You can always quickly snap back to a desired view as shown in the previous section.

2.4.2 ZOOM

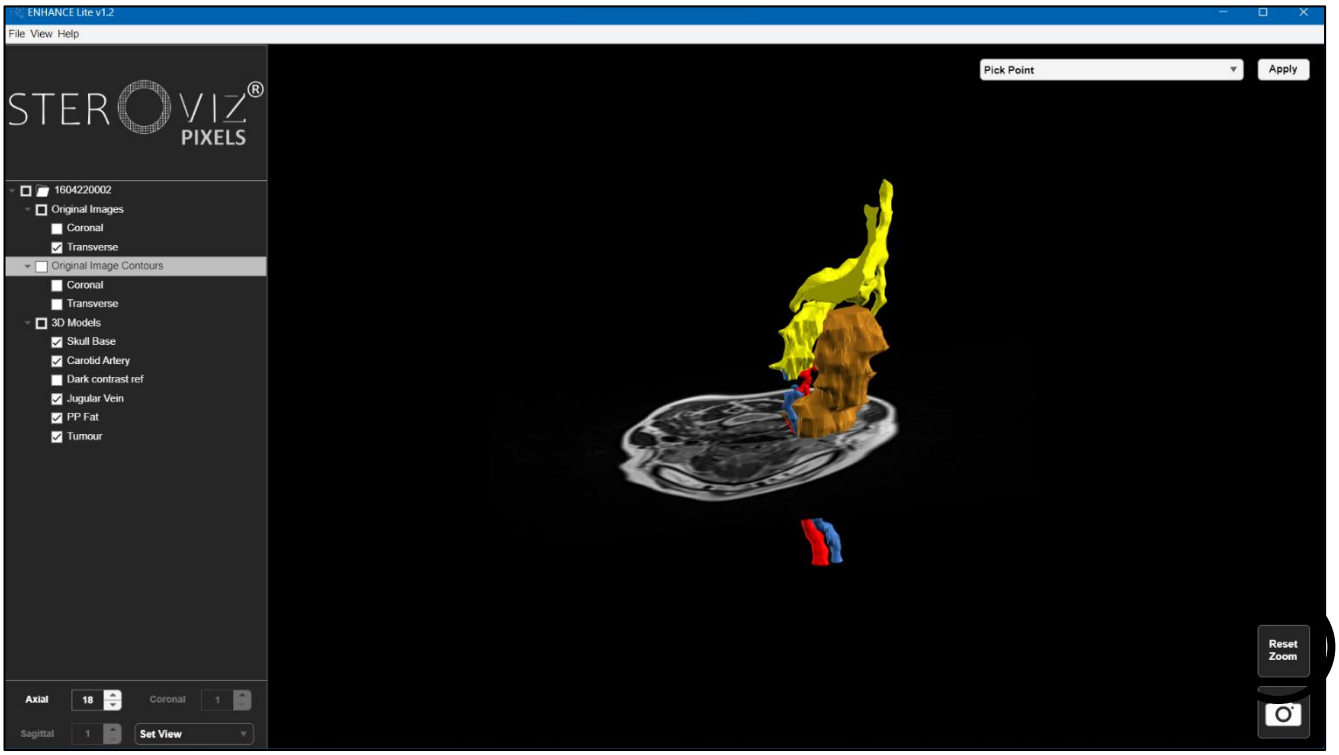
- To zoom in, **place your cursor over the desired area** to enlarge and **scroll the middle button of your mouse forward**, or **place two fingers on your laptop touchpad and slide towards yourself**.



- To zoom out, **scroll the middle mouse button back**, or **place two fingers on your laptop touch pad and slide towards the monitor**.



- To go back to default zoom view, **click the 'Reset Zoom'** button on the bottom right side.

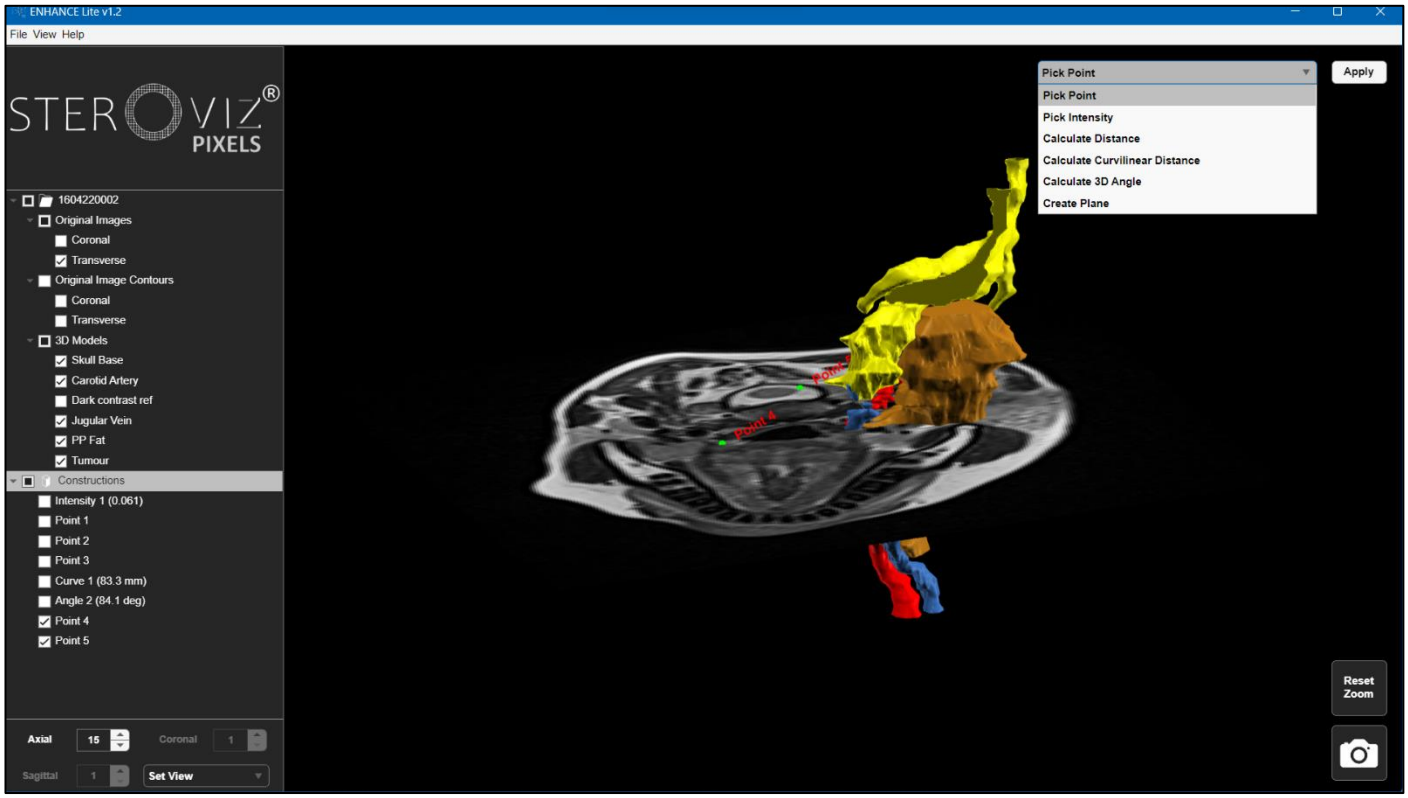


3. CONSTRUCTIONS

3.1 PICK POINT

On the upper right corner of the screen, there is a drop-down menu consisting of three options. The first one, which is selected by default, is 'Pick Point.' To use this tool, **select 'Apply'** next to the drop-down menu, and **click on any point on the images or models**.

The newly created points appear in the layered tree, under 'Constructions.' They can be viewed and removed from view by clicking on the tick-boxes next to the corresponding point name.



Click on 'Apply' every time you want to select a point.

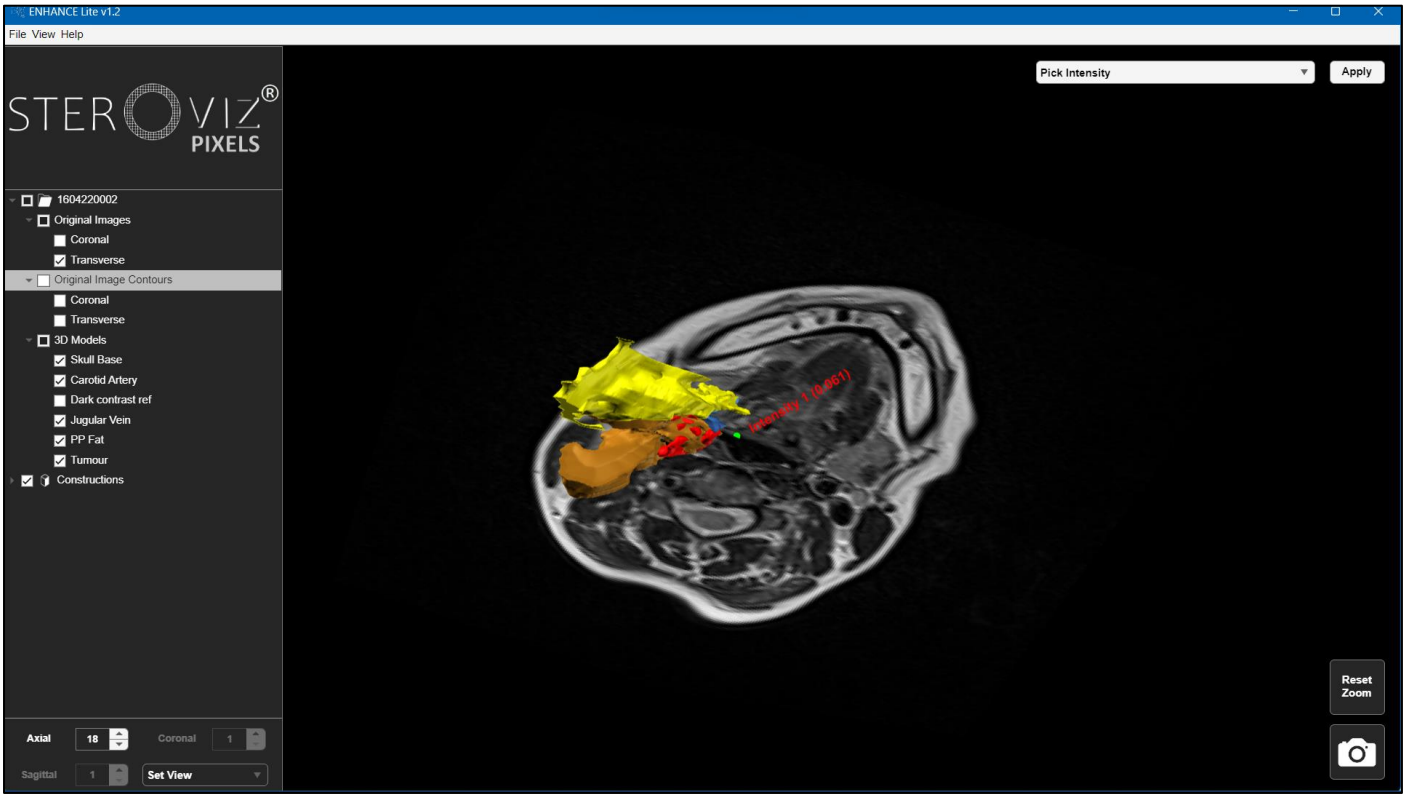
The points can be renamed and the colour can be changed as described in section 2.2.3.

Right click on the point name under constructions and select 'Delete' to remove the point.

3.2 PICK INTENSITY

The second option is 'Pick Intensity'. This can be used to calculate density of different tissues. To use this tool, **select 'Pick Intensity,'** and then **click on apply**. **Click on any point of the original or derived images,** and a point shows up indicating the intensity as shown below.

These values also appear in the layered tree, under 'Constructions.' They can be viewed and removed from view by clicking on the tick-boxes next to the corresponding point name.



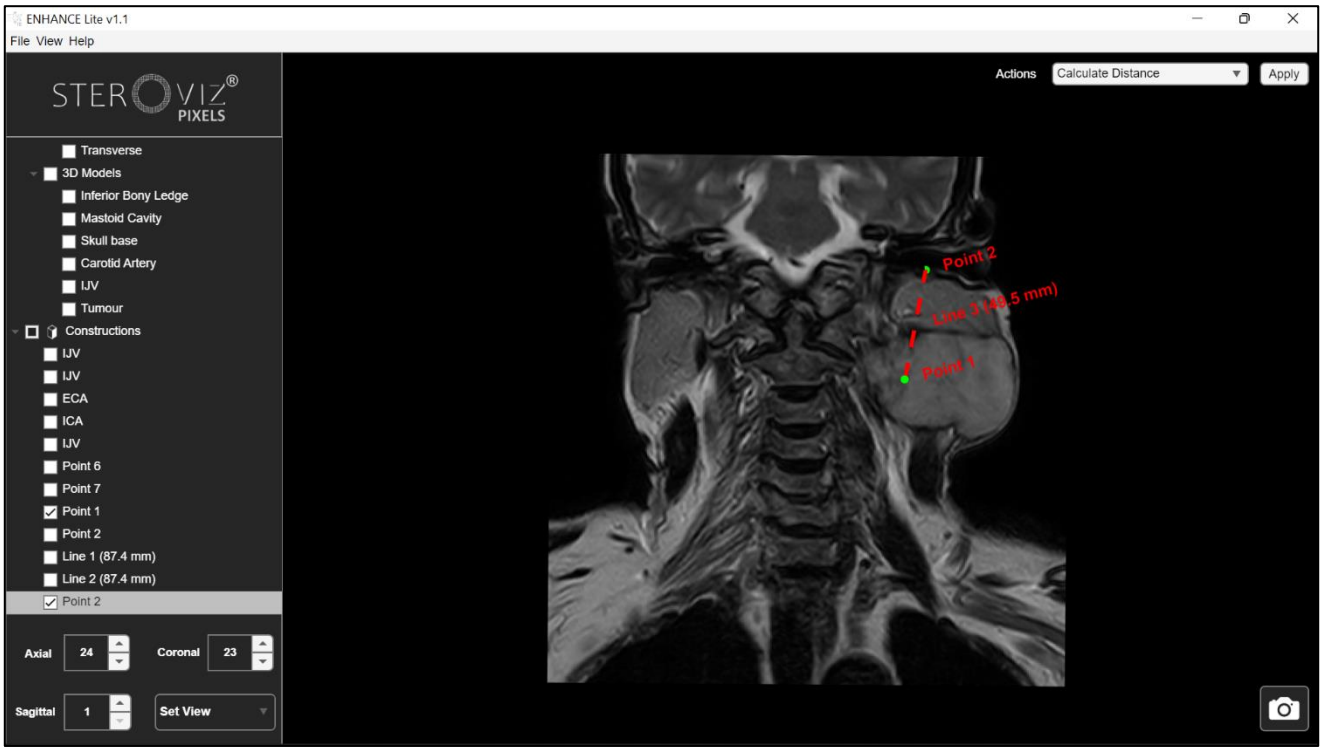
Click on 'Apply' every time you want to view the intensity at a point.

The points can be renamed and the colour can be changed as described in section 2.2.3.

Right click on the point name under constructions and select 'Delete' to remove the intensity point.

3.3 CALCULATE DISTANCE

The following option on the drop-down menu is 'Calculate Distance'. For this feature, **two points must be created and selected** on the layered tree. After ensuring that two points are selected, **click on 'Calculate Distance', and then click on 'Apply.'** The result of this operation is shown below.



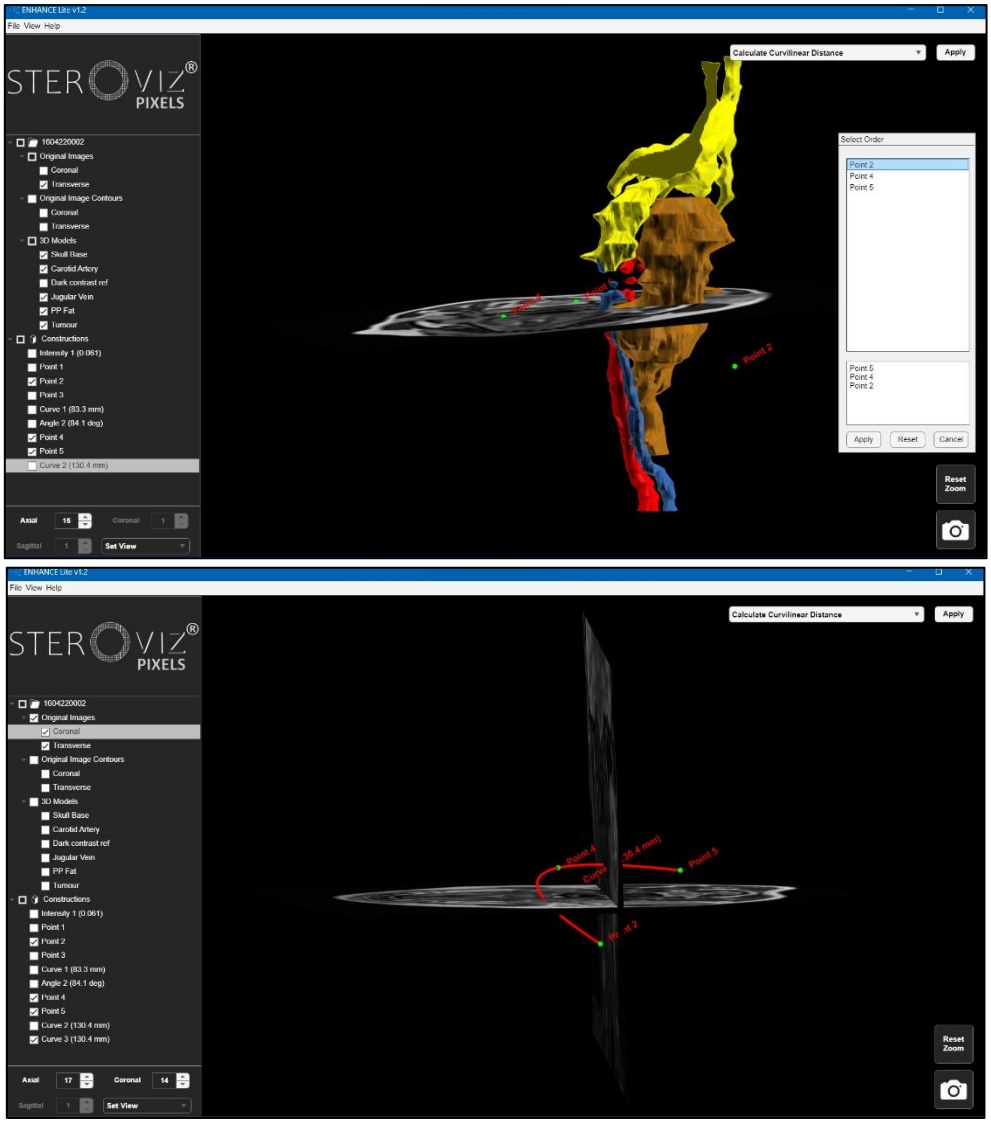
The newly created line appears in the layered tree, along with the distance between its two end points, under 'Constructions.' It can be viewed and removed from view by clicking on the tick-boxes next to the corresponding point name.

The line can be renamed and the colour can be changed as described in section 2.2.3.

Right click on the line name under constructions and select 'Delete' to remove the line.

3.4 CALCULATE CURVILINEAR DISTANCE

The next option on the drop-down menu is 'Calculate Curvilinear Distance'. For this feature, **more than two points must be created and selected**. After ensuring that two points are selected, **click on 'Calculate Distance', and then click on 'Apply.'** The order of required points can be selected from a pop-up window. Once this is done, click on the 'Apply' button on that window. The result of this operation is shown below.

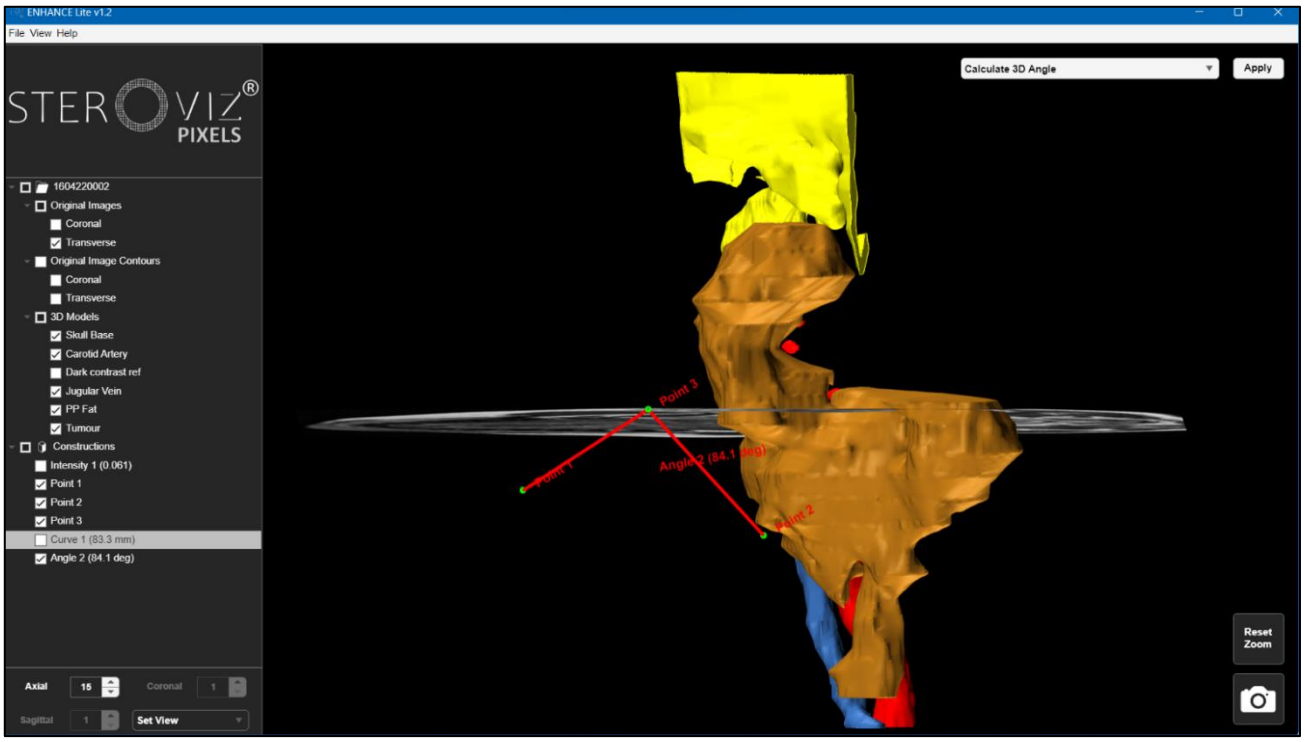


The newly created curve appears in the layered tree, along with the distance between its two end points, under 'Constructions.' It can be viewed and removed from view by clicking on the tick-boxes next to the corresponding point name.

The curve can be renamed and the colour can be changed as described in section 2.2.3. Right click on the curve name under constructions and select 'Delete' to remove it.

3.5 CALCULATE 3D ANGLE

The fifth construction on the drop-down menu works similarly to 'Calculate Curvilinear Distance' in section 3.5. **Three points must be created** and selected. Following this, **select 'Calculate 3D Angle'** from the menu and **choose the required order of points from the window that pops up**. Then, **click on 'Apply'**. The result of this operation is shown below



The newly created angle appears in the layered tree under 'Constructions.' It can be viewed and removed from view by clicking on the tick-boxes next to the corresponding point name.

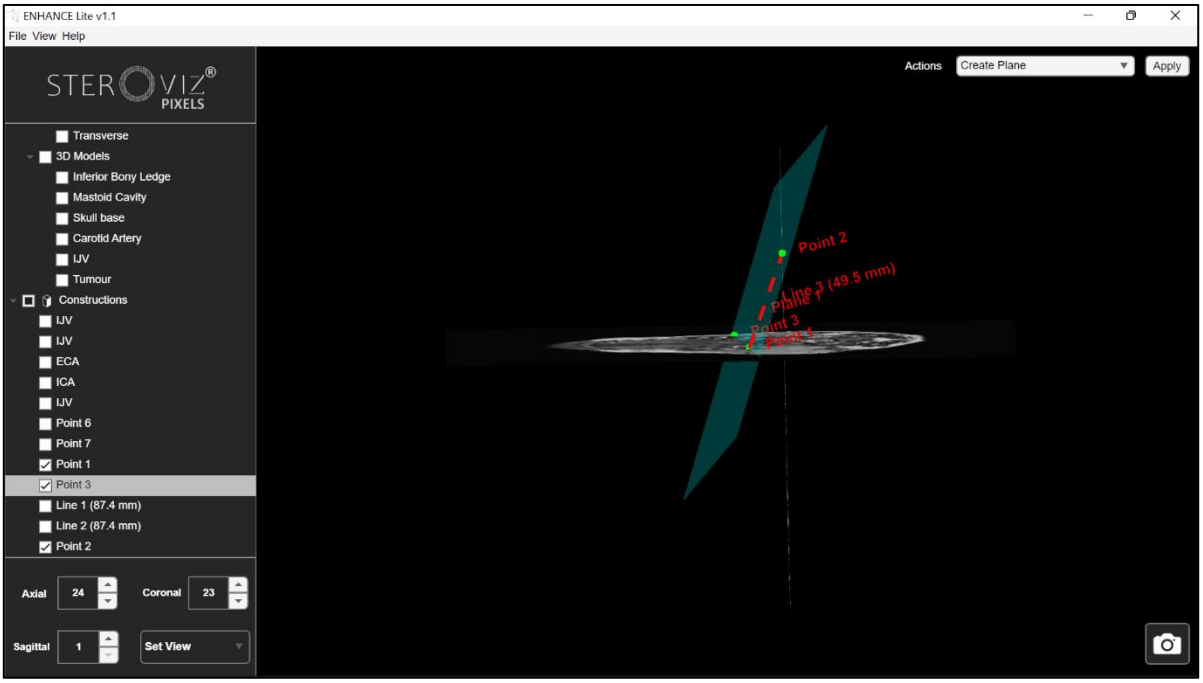
The angle can be renamed and the colour can be changed as described in section 2.2.3.

Right click on the angle name under constructions and select 'Delete' to remove it.

3.6 CREATE PLANE

The third and final option on the drop-down list is 'Create Plane.' To use this feature, **3 points** must be selected. Once the required features have been selected, **click on 'Create Plane' and then click 'Apply'**.

The result of this operation is shown below.



The newly created plane appears in the layered tree under 'Constructions.' It can be viewed and removed from view by clicking on the tick-boxes next to the corresponding point name.

The plane can be renamed and the colour can be changed as described in section 2.2.3.

Right click on the plane name under constructions and select 'Delete' to remove the plane.

CONTACT INFORMATION

For additional resources or further assistance, contact us on **info@steroviz.com** .

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https://www.youtube.com/channel/UCnOjG4jcD-ZSY3oXYzk_41w