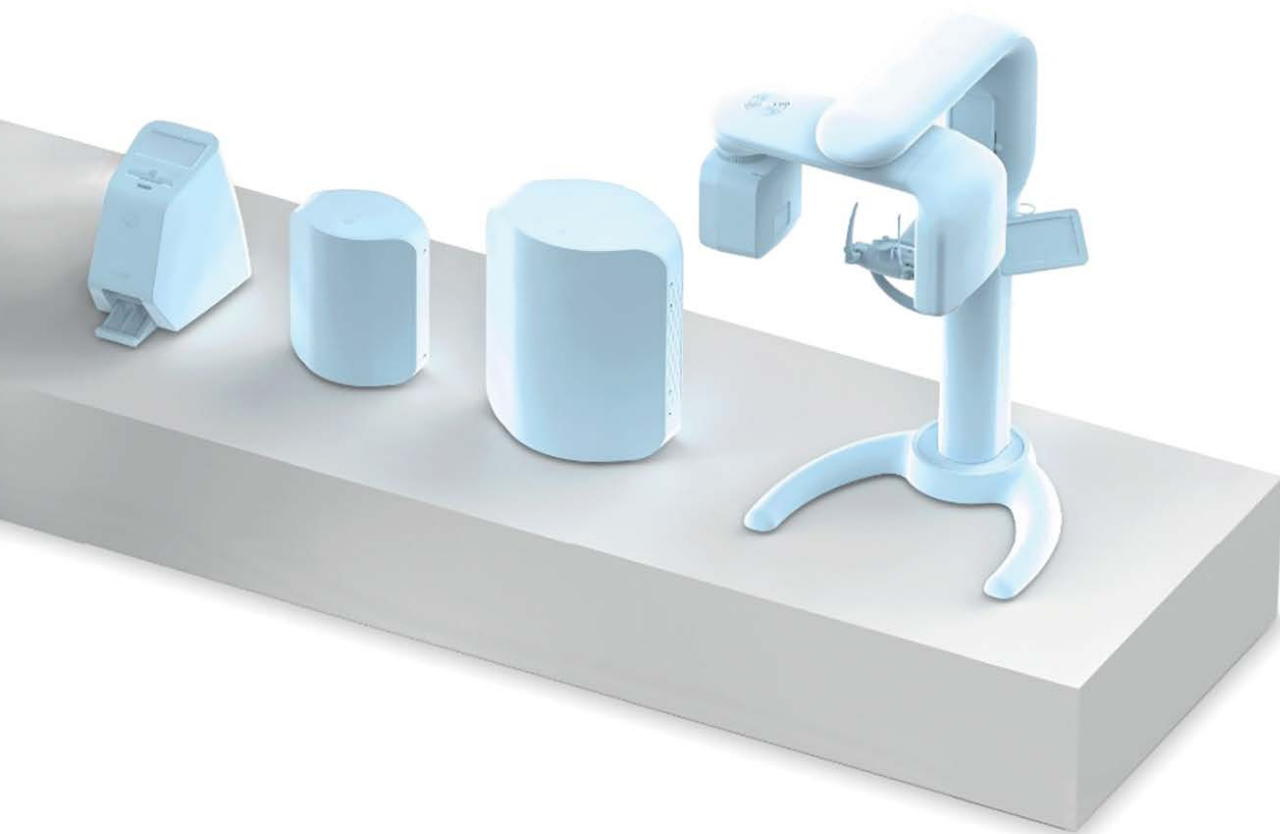


# RAYFace



**USER GUIDE**  
RAYFace

# RAYFace



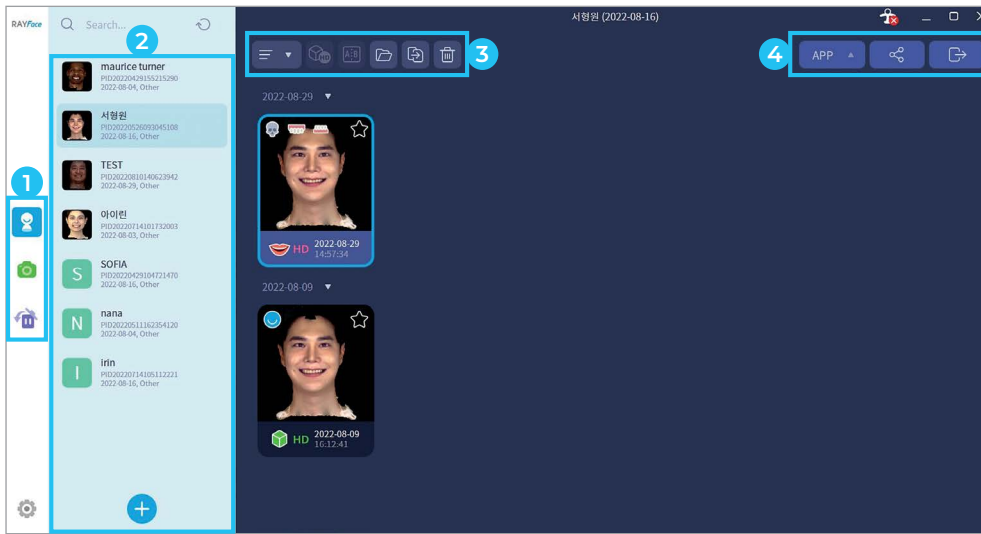
# TABLE OF CONTENTS

IMAGE CAPTURE.....	4
IMAGE DATA ALIGNMENT - IOS.....	7
IMAGE DATA ALIGNMENT - CBCT.....	11
REORIENTATION.....	13
SMILE PREVIEW.....	16
DSD.....	22
OTHER FEATURES.....	27



# CAPTURE

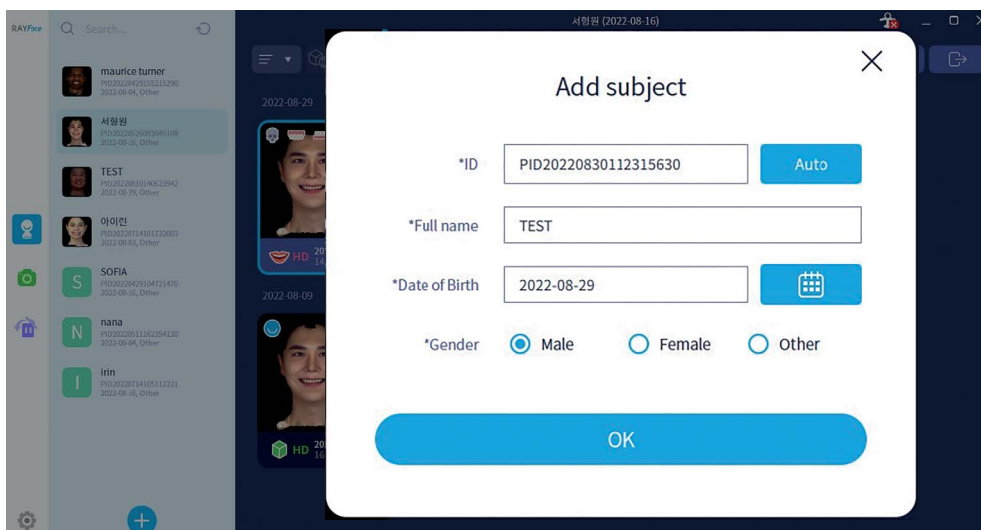
## UI AND MENU



No	Icon	Description
1		Back to main
		Capture
		recycle bin
2	-	Patients list and registration
3		Search by condition
		Data reconstruction
		Data compare
		Raw data
		Go to saved folder
		Delete scan data
	4	
		Shared with RAYTeams
		Export data

## PATIENTS SELECT: NEW PATIENT REGISTRATION

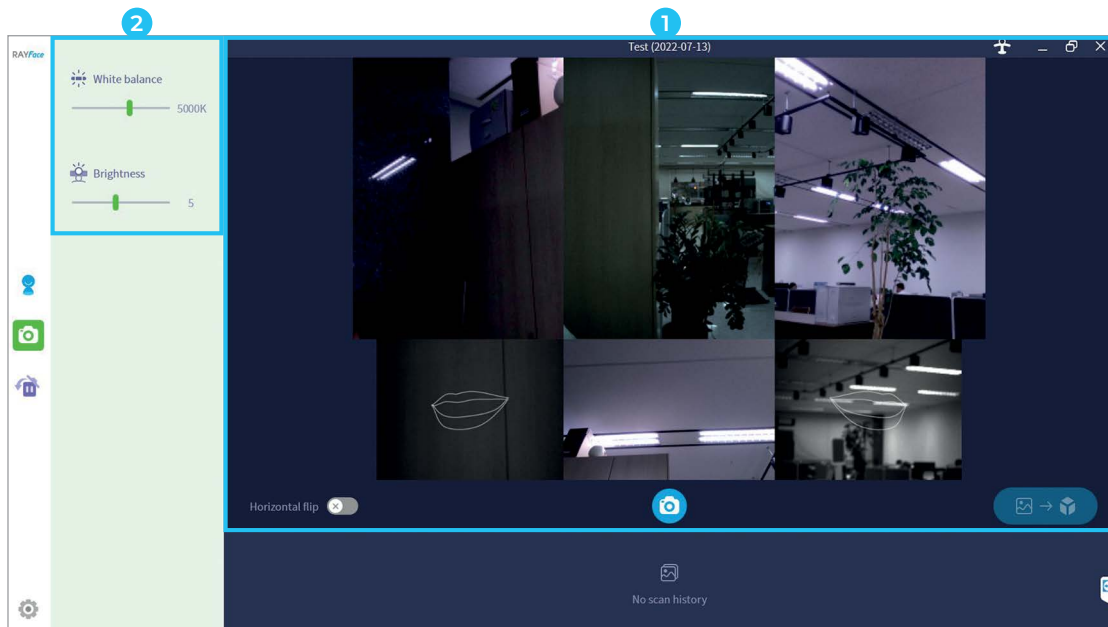
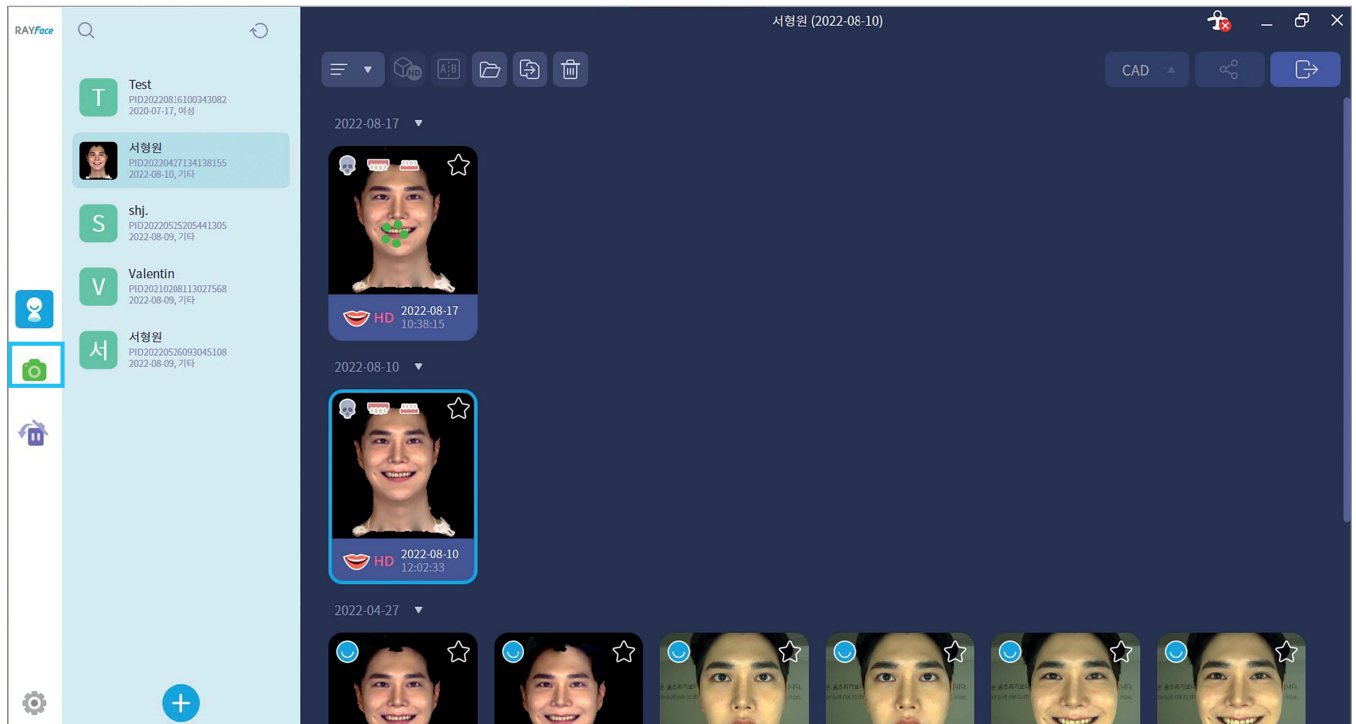
· Click button at left bottom of patients list then enter proper information at blank



- ID: click the [Auto] button, a new ID will be created
- Full name : fill in name of patient
- Date of Birth: click the [calendar] button then select
- Gender: select gender of the patient

## IMAGE CAPTURE

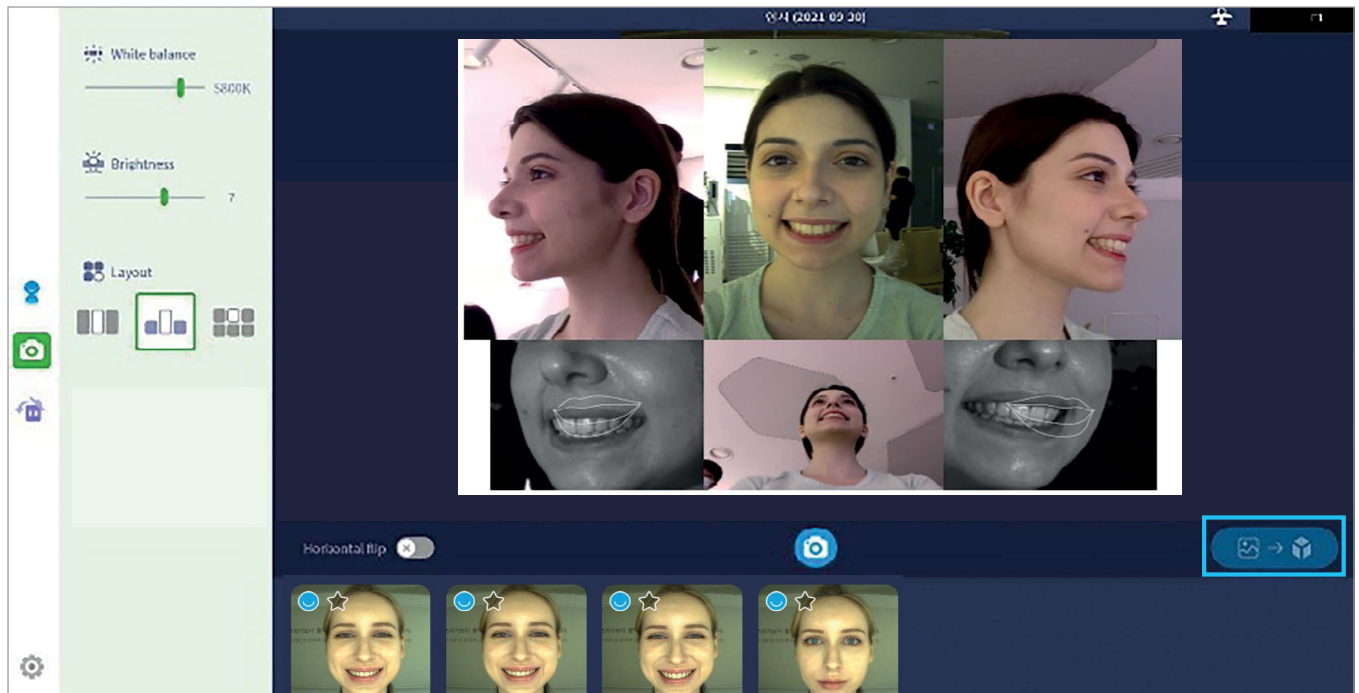
· After selecting a patient, click the left camera button 



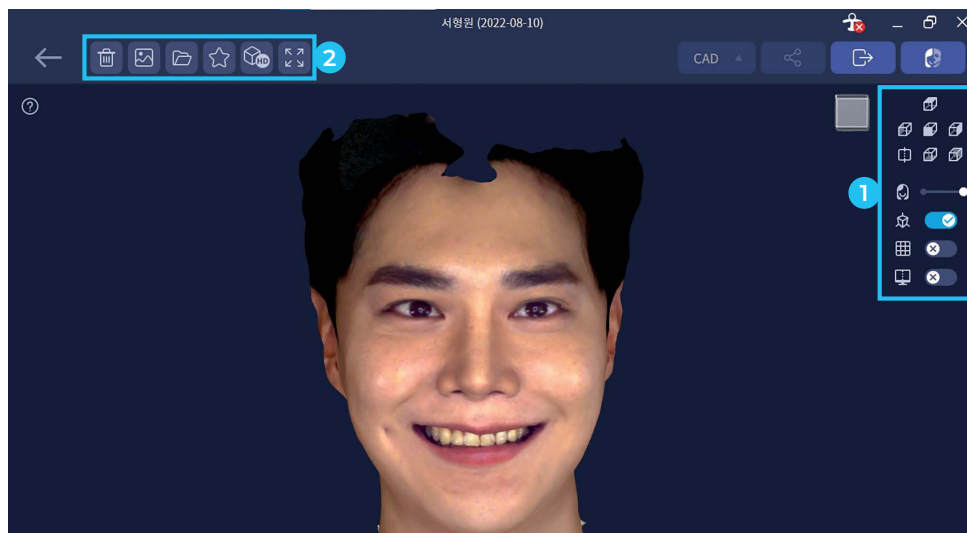
No	Description
1	Real time view
2	Adjust menu for white balance and brightness

### SELECT A SMILE IMAGE AND RECONSTRUCTION

- Position the patient with the guide line on the screen then capture an image
- Images are able to be captured multiple times then select best image among them and click [reconstruction] button at the bottom



### IMAGE CONFIRMATION



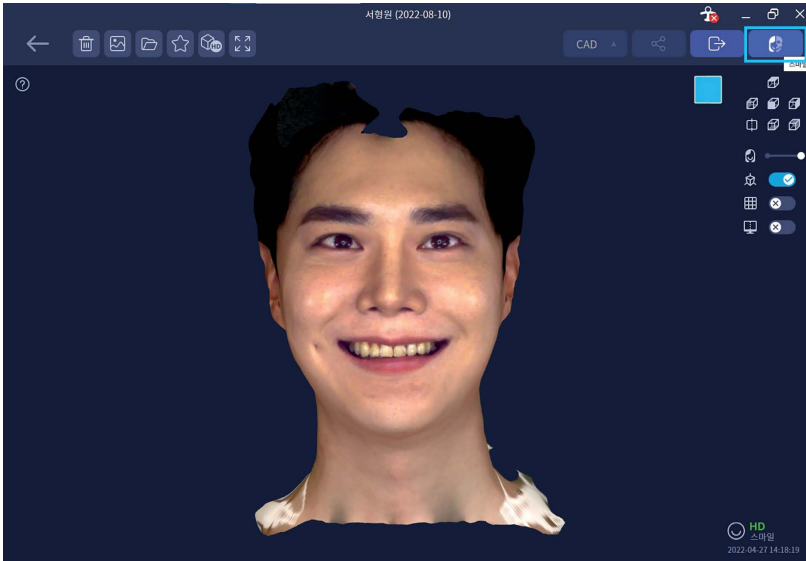
- Image resizing: scroll wheel of mouse up and down
- Image direction adjustment: adjusting a direction during clicking the right button of mouse or select [View] on menu bar

No	Icon	Description
1		Image view direction
		Image opacity adjustment
		Perspective view on/off
		Graticule on/off
		Split screen on/off
2		Deleted captured image
		View (2D) face shooting video
		Raw data
		Bookmark
		Image reconstruction
		Full size of screen

# IMAGE DATA ALIGNMENT – IOS

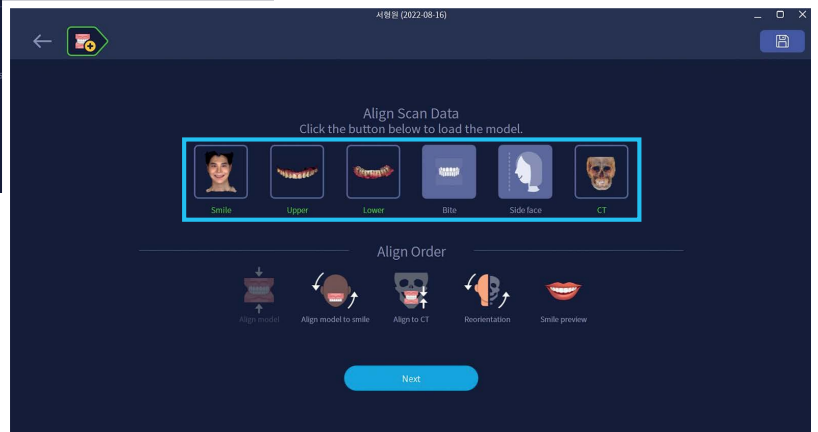
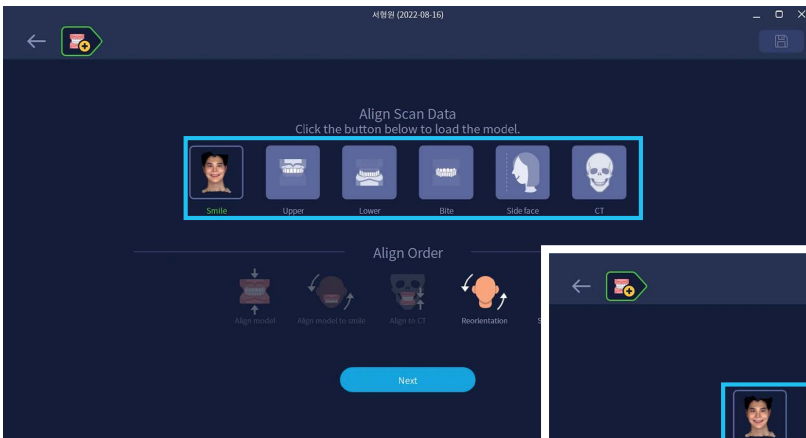
## ALIGNMENT PAGE

- Go to alignment page by clicking the button at the top right corner



## IMPORT IMAGE DATA FOR ALIGNMENT

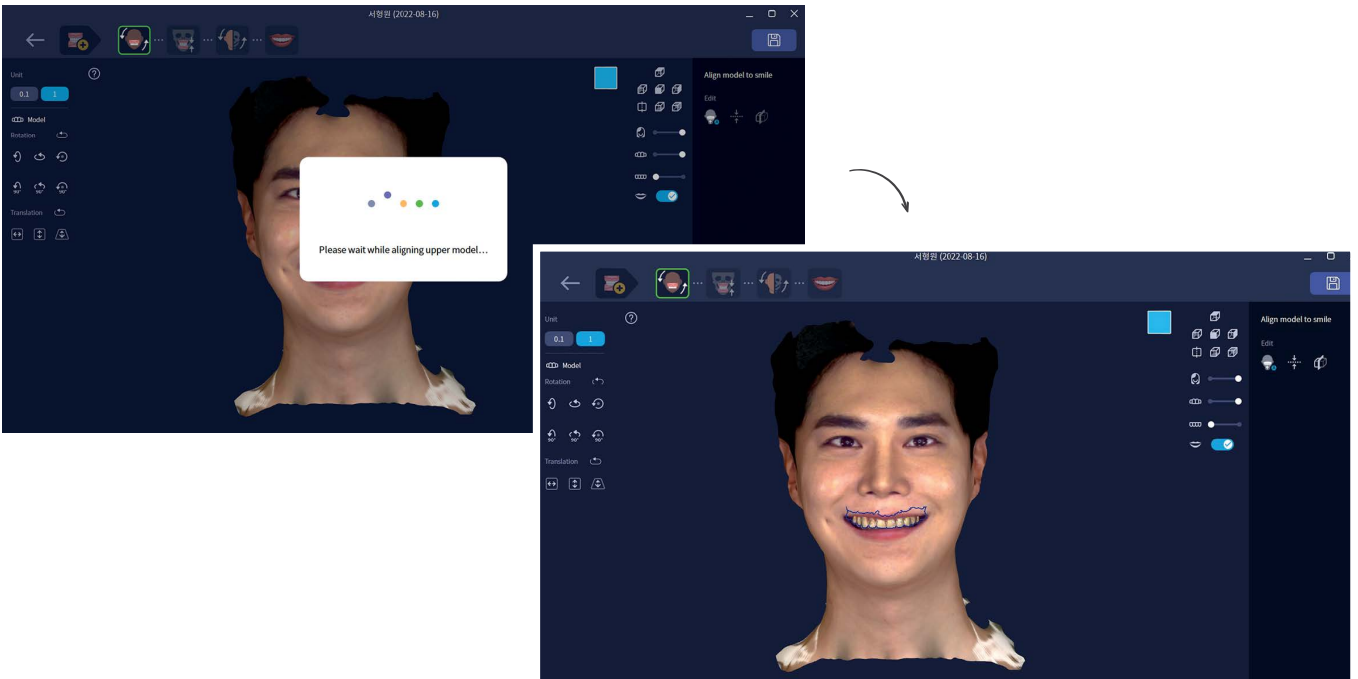
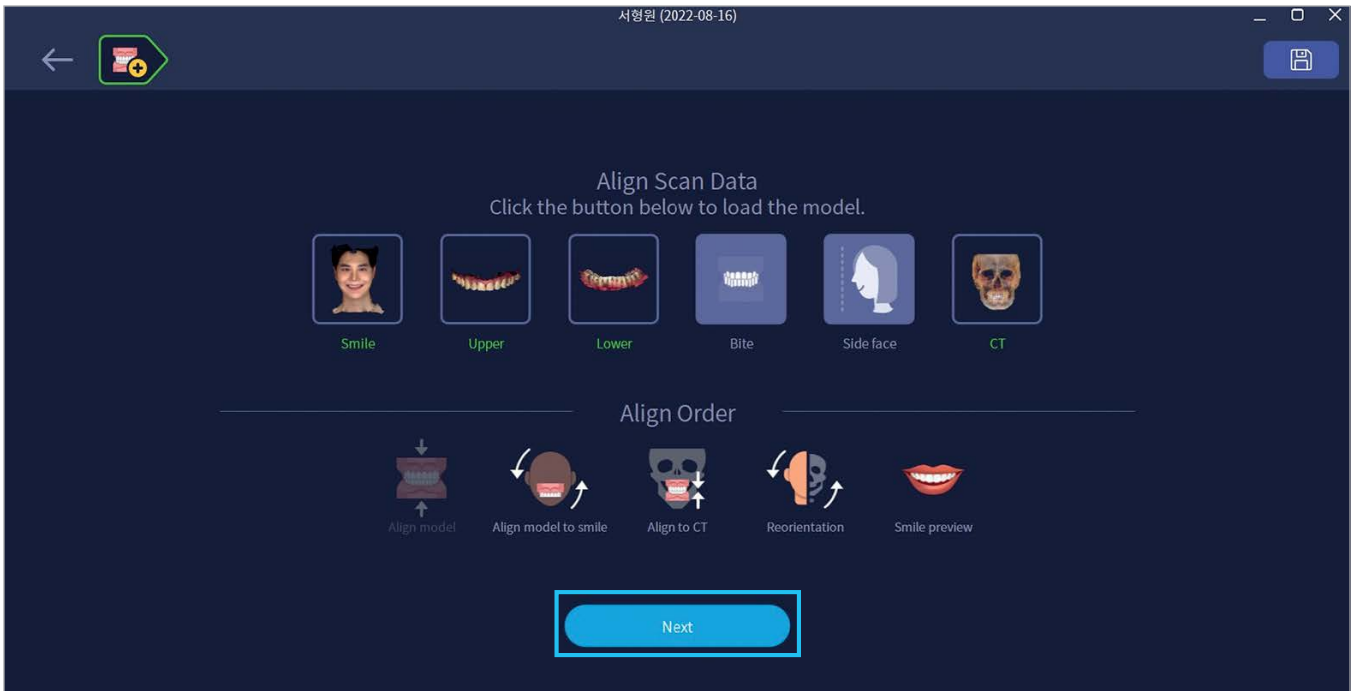
- Click each type of scanned image and Import an image data



Type	Description
Upper/lower jaw	IOS data - STL, PLY, OBJ
Lateral image	2D lateral image - JPG, PNG, BMP
Bite	Impression scan occlusion data - STL, PLY, OBJ
CT	CT data- DICOM


## AUTO ALIGNMENT

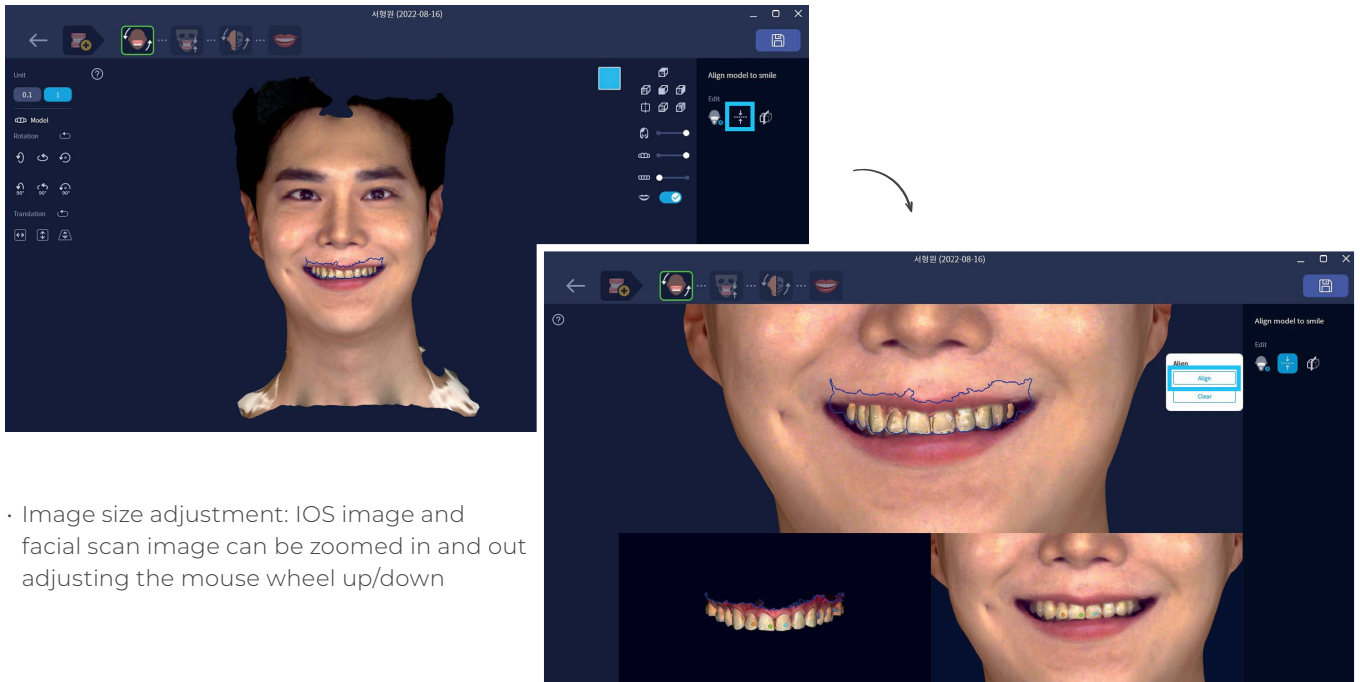
- After selecting the required data on the data import page, click the 'Next' button at the bottom to move to IOS data alignment step
- IOS data is automatically aligned and micro-alignment and adjustment can be performed if needed






## MANUAL ALIGNMENT

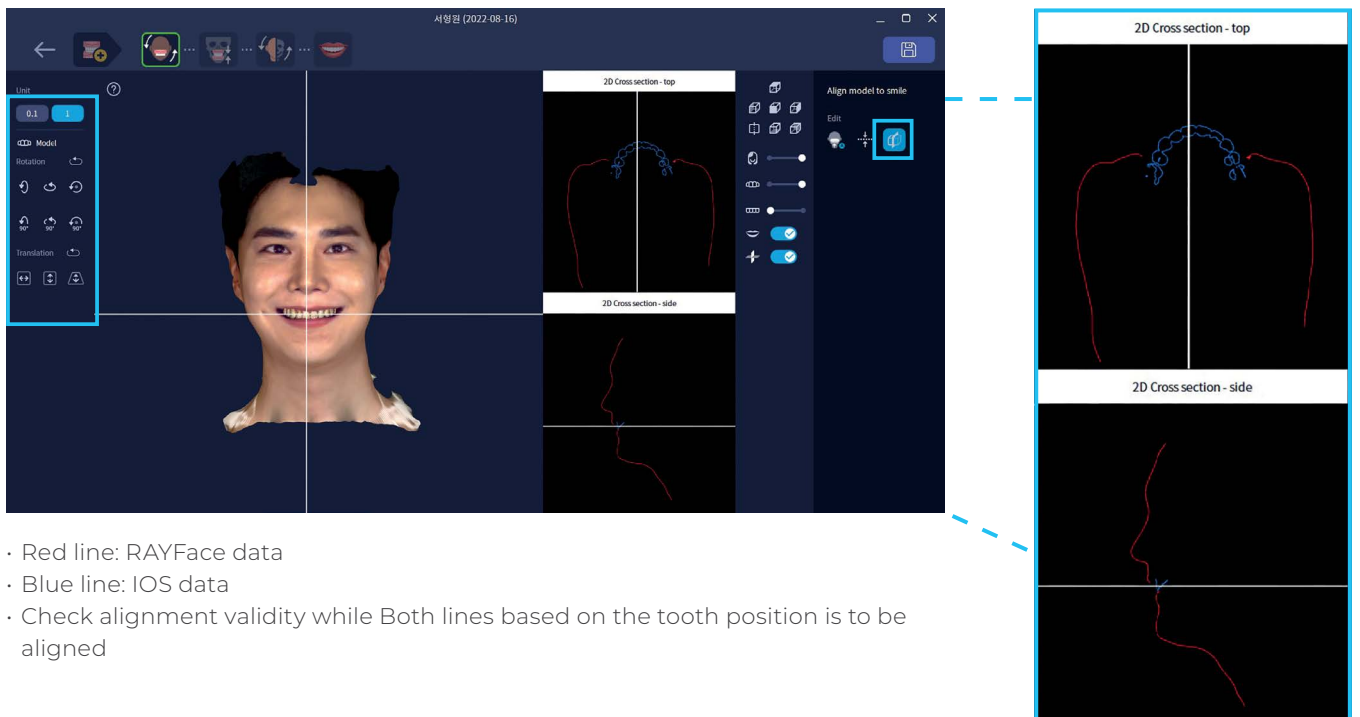
- click the  button to activate a manual alignment
- Choose points on 4 incisors of 3D Facial image and IOS image as below and click [align] button to overlap both
- Micro adjustment can be performed if necessary after completing an alignment



- Image size adjustment: IOS image and facial scan image can be zoomed in and out adjusting the mouse wheel up/down

## ALIGNED IMAGE DATA CONFIRMATION

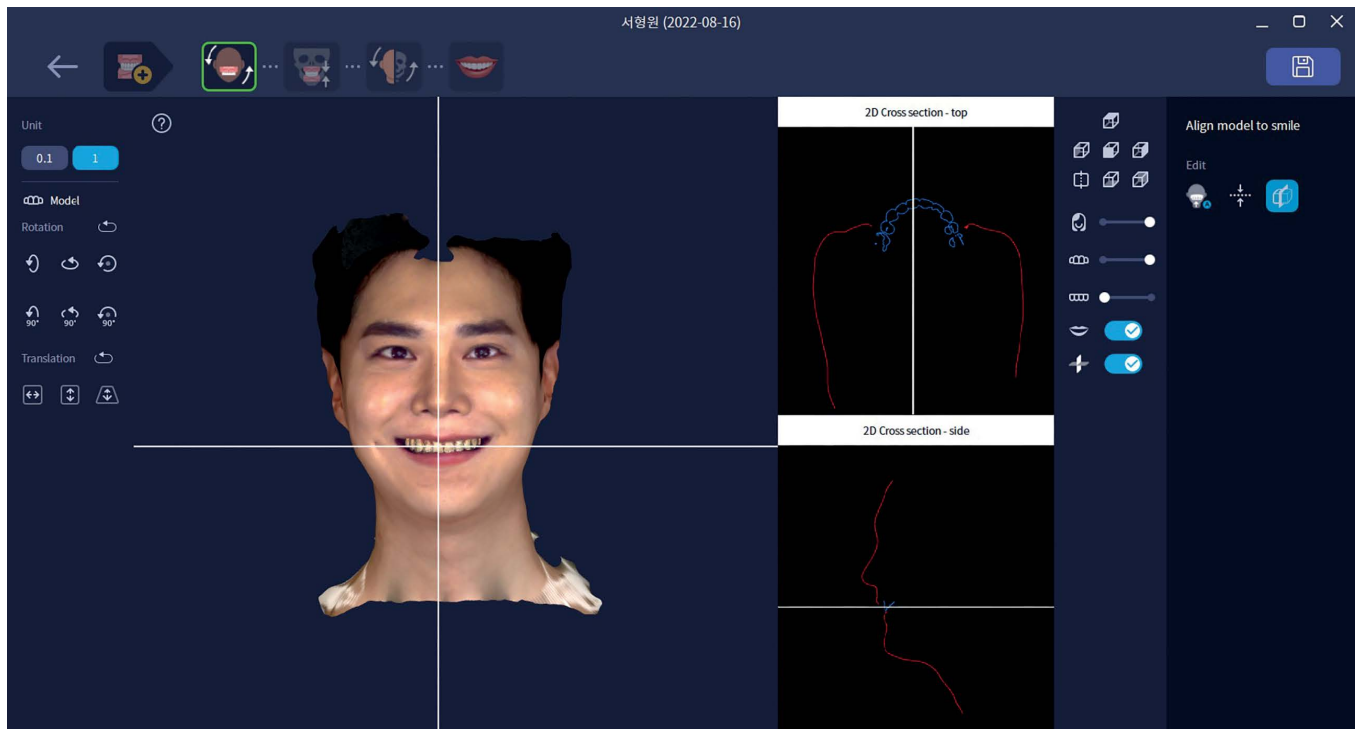
- Click  button then surface line of scanned image will be loaded on sectional viewer
- Move the reference line on to the tooth position, move up/down, left/right, and check the accuracy on cross section view at the same time. Micro adjustment can be performed with left control menu



- Red line: RAYFace data
- Blue line: IOS data
- Check alignment validity while Both lines based on the tooth position is to be aligned


### MICRO ADJUSTMENT OF ALIGNMENT

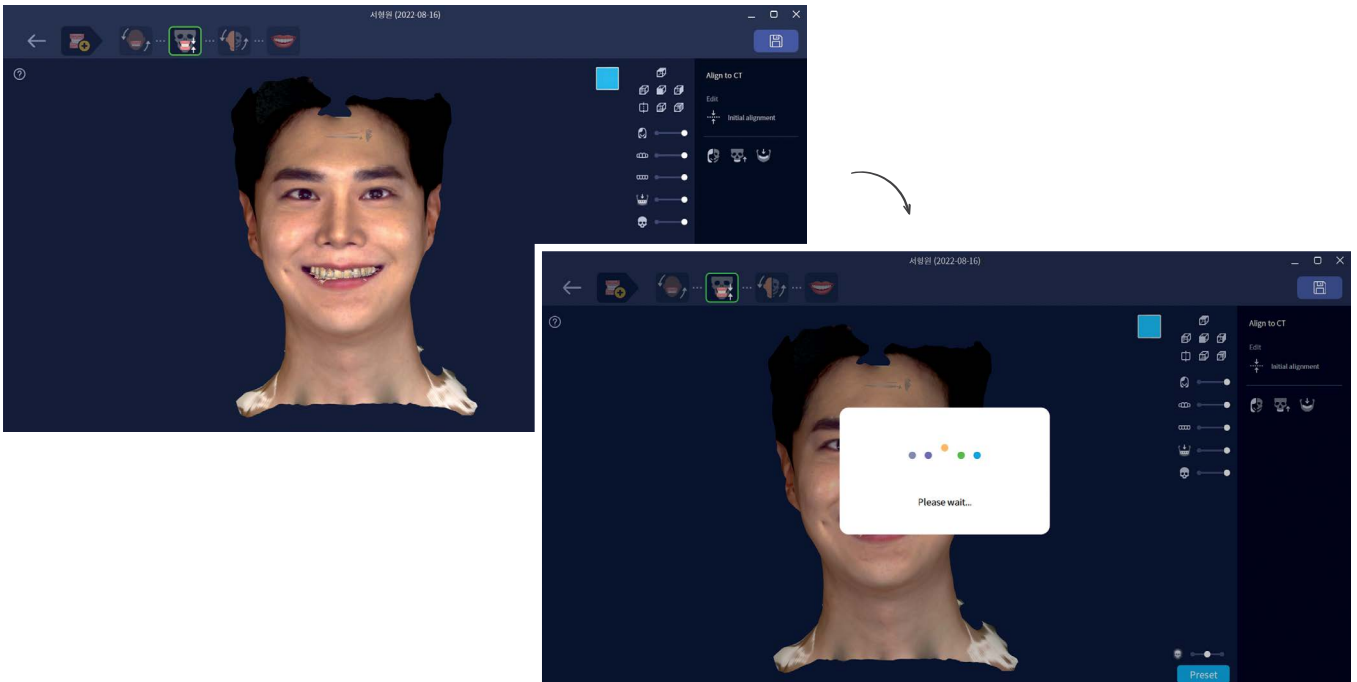
- After checking a condition of alignment, Micro adjustment is able to be performed for IOS data with the menu on the left side
- [Up/Down/Left/Right/Front/Rear/Angle] and type of length(0.1mm or 1mm) can be adjusted and selected



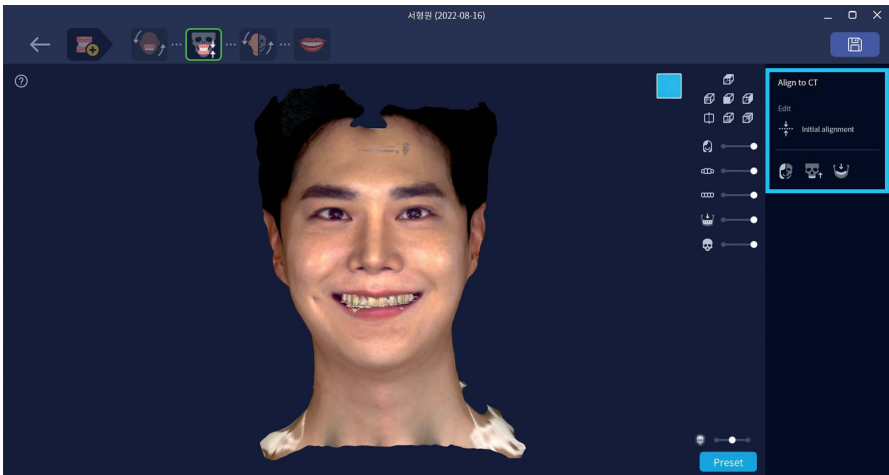
# IMAGE DATA ALIGNMENT – CBCT

## IMAGE DATA ALIGNMENT





- Get in to the CT data alignment after clicking the  button on top of the screen and CT data will be aligned with 3D facial image and IOS image automatically



## ALIGNED IMAGE DATA CONFIRMATION

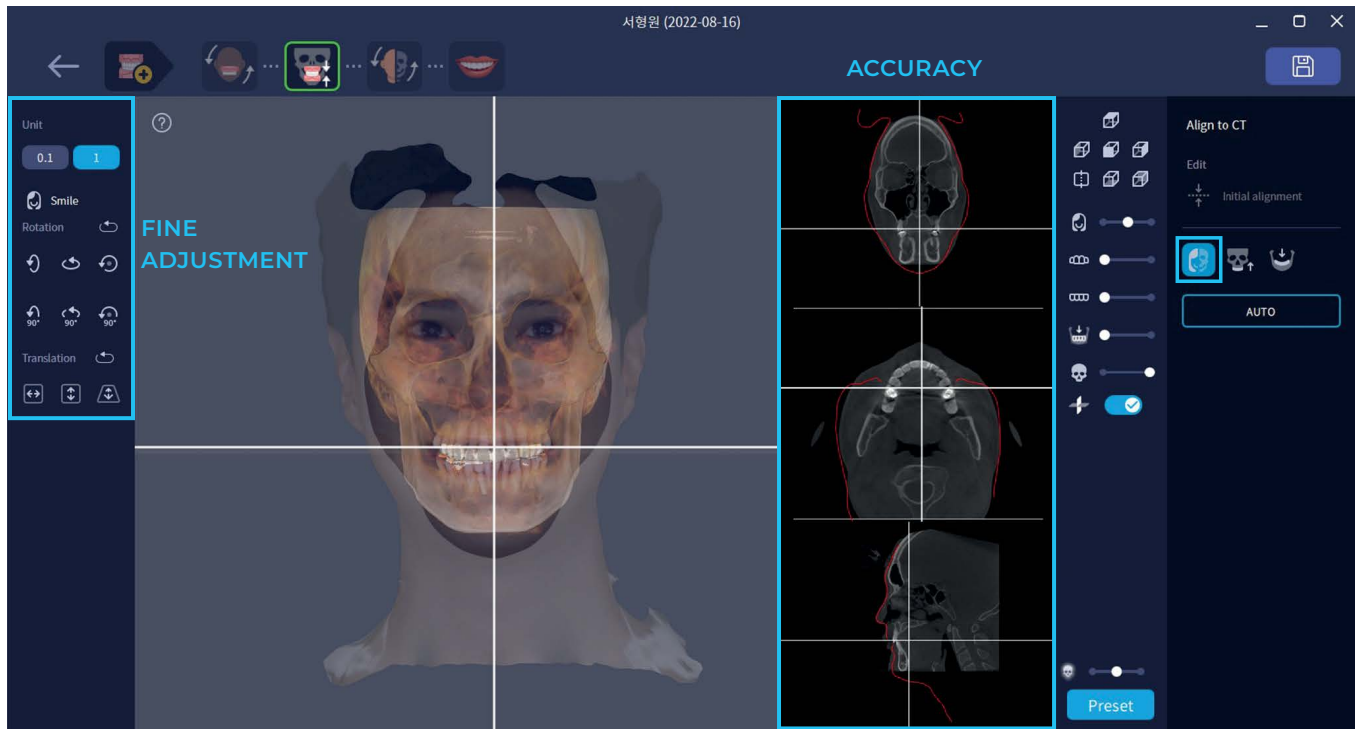


- Use the menu to check the condition of alignment of the Data(CT/RAYFace, CT/Upper jaw of IOS, CT/Lower jaw of IOS)
- Check the accuracy of alignment for X,Y and plane position on the cross section view

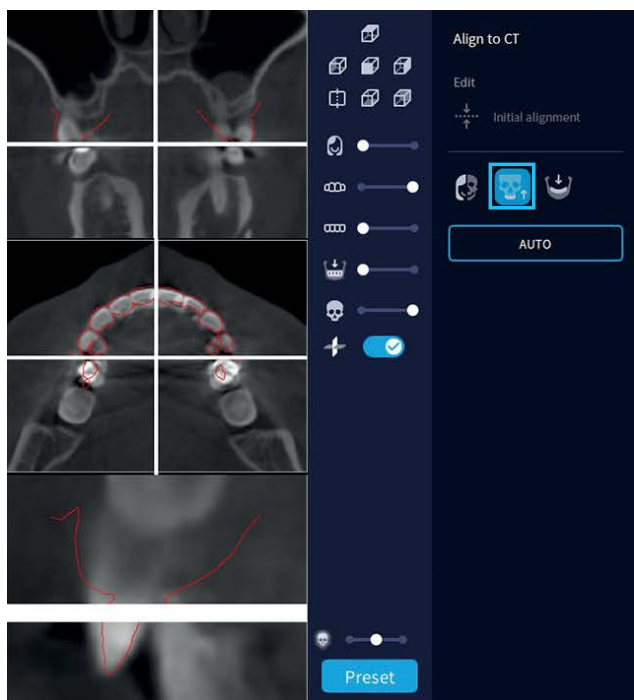
Icon	Description
	Re-alignment CT
	Alignment status confirmation with CT and 3D Facial scan
	Alignment status confirmation with CT and upper jaw of IOS
	Alignment status confirmation with CT and lower jaw of IOS

## ALIGNED IMAGE DATA CONFIRMATION

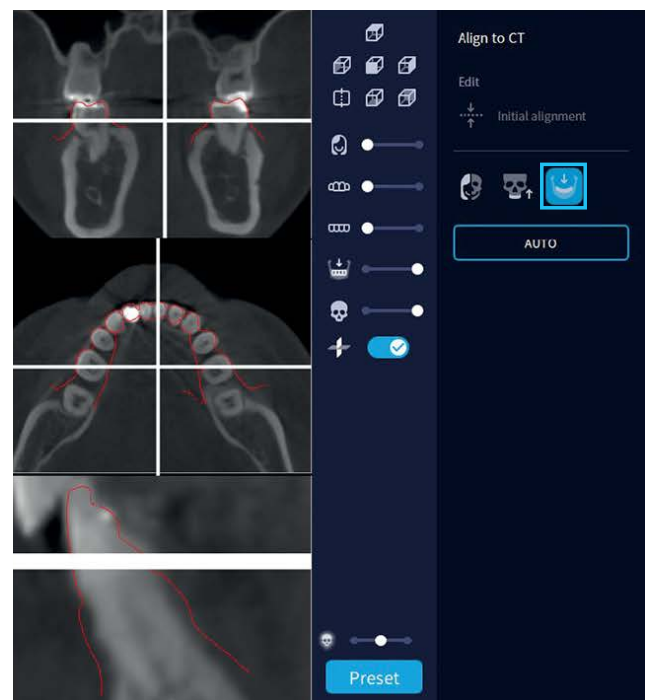
- CT data is aligned via incisor tooth on RAYFace data
- Outline of 3D Facial scan is in red in CT data
- You can realign an IOS data of lower jaw, under CT data the IOS data of lower jaw can be exported



Checking alignment status between CT data and 3D facial data




Checking the alignment status between CT data and maxillary IOS data

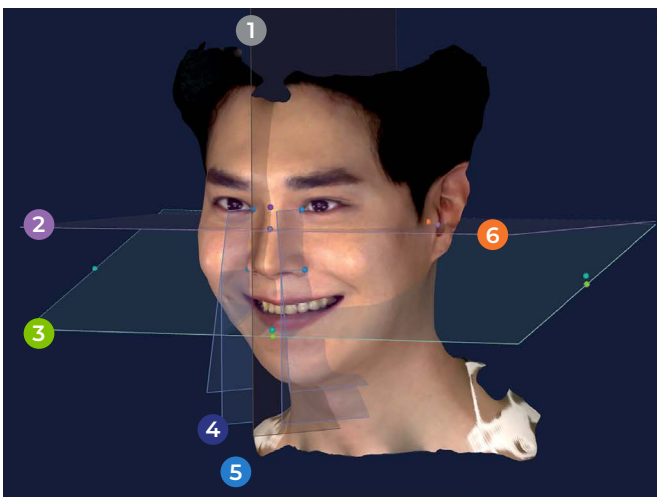
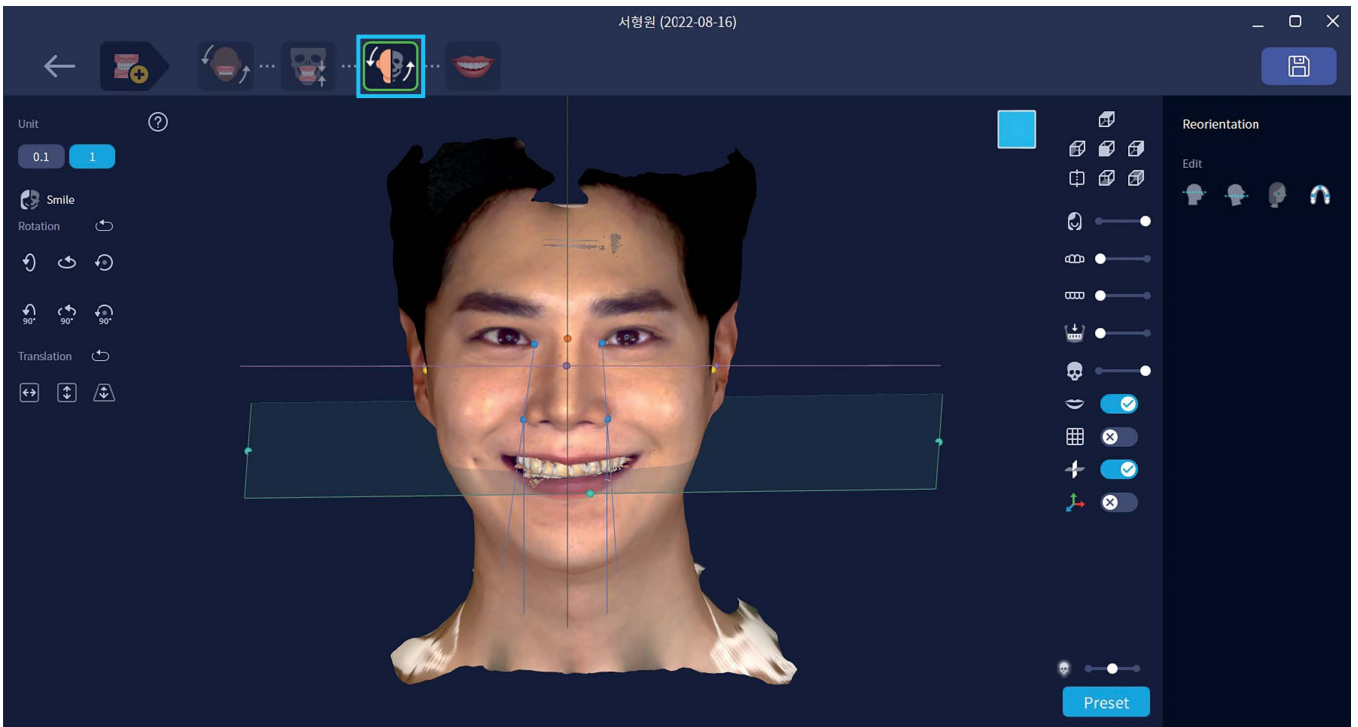








Checking the alignment status between CT data and lower jaw of IOS data

# REORIENTATION

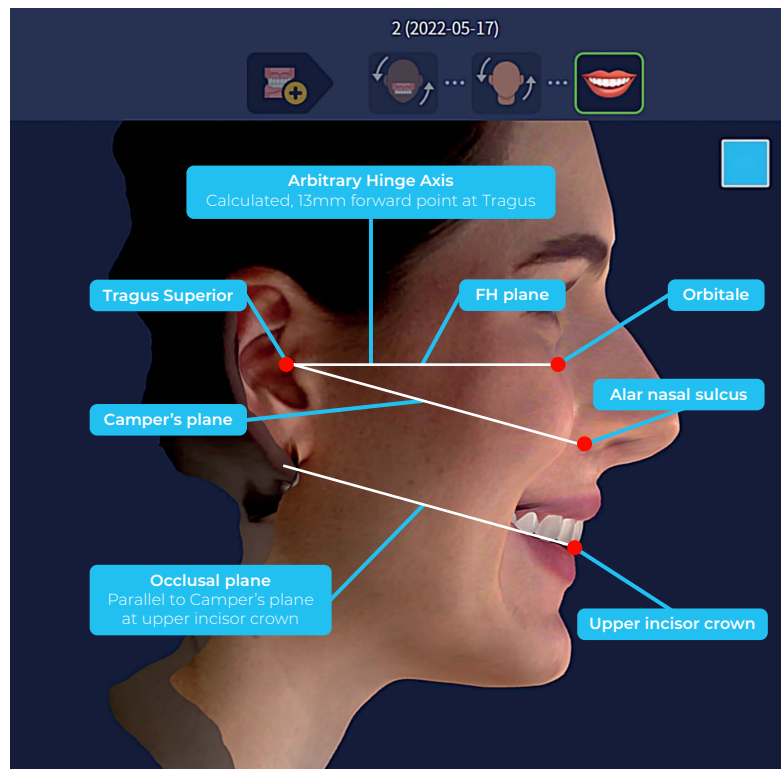
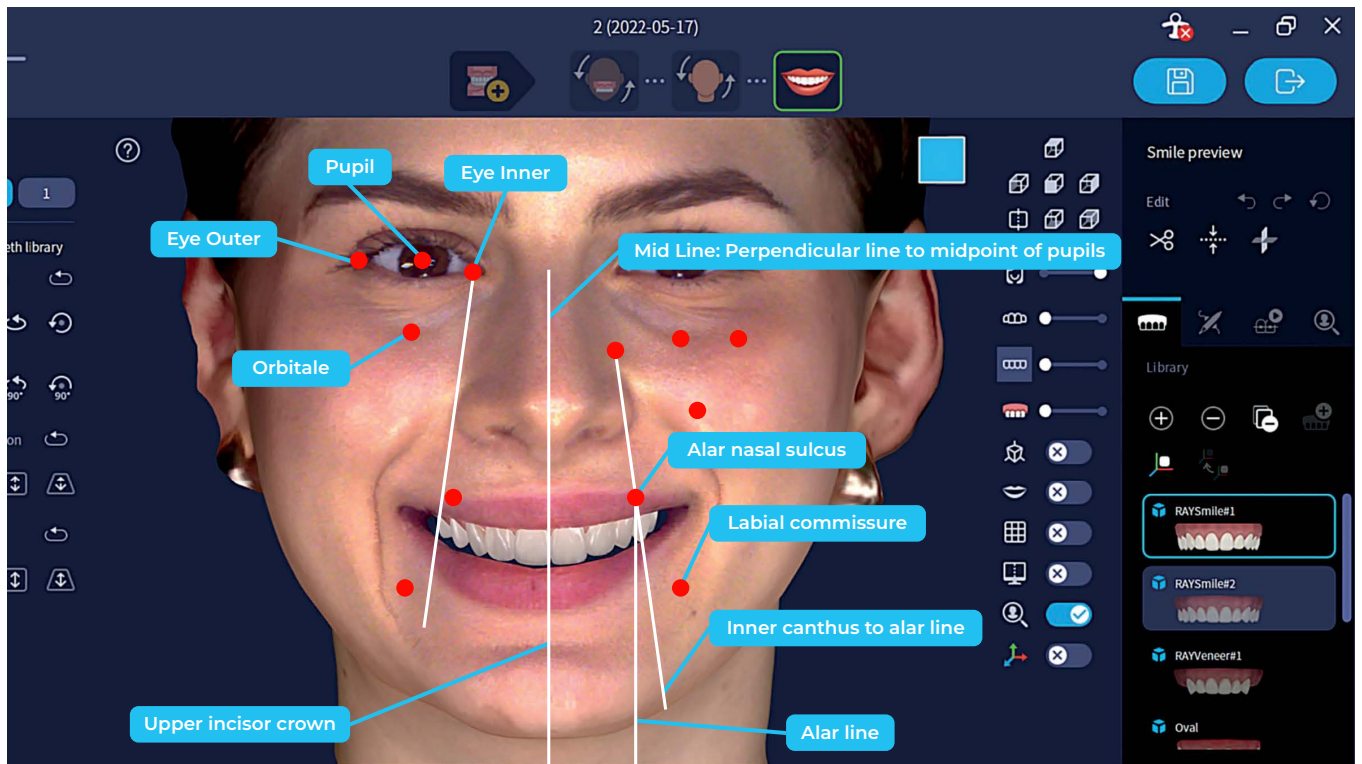
## AUTOMATIC CREATION OF LANDMARKS AND REFERENCE POINT

- click  button on top of the screen to automatically generate Key landmarks and plan information on to the [Re- reorientation] tap



Icon	Item	Description
	Midline	The center of the vertical line between both pupils
	FH Plane	Plane that intersects both Porion and the left Orbitale
	Occlusal Plane	An imaginary surface that theoretically touches incisal edges of the incisors and the tips of the occluding surfaces of the posterior teeth (Automatically generated only when there is IOS data)
	Inner Canthus to Alar line	Line from pointer of inner eyes to pointer of Alar
	Alar line	Vertical line on the left and right outer corners of the nose
	Arbitrary Hinge axis	It`s automatically created as a point 13mm from the Tragus Superior position toward the outer corner of the eye, and the user can adjust the point

## DEFINITION OF LANDMARK & PLANE



### ALAR NASAL SULCUS

End point of the rounded sides on the nose

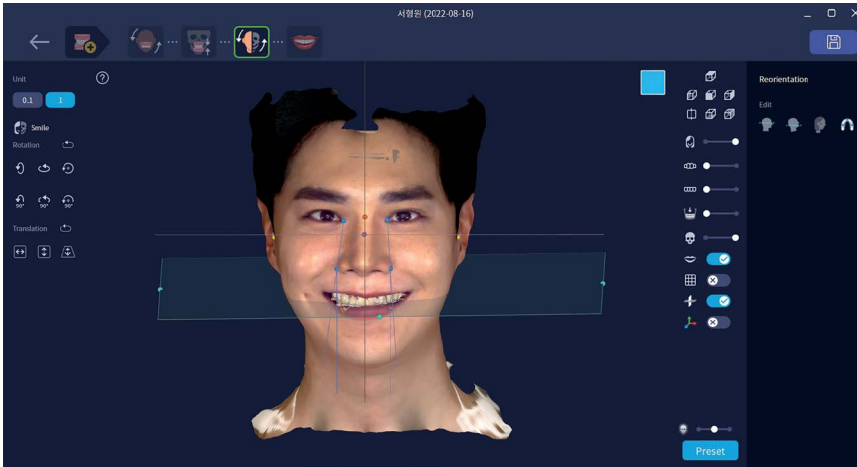
### TRAGUS SUPERIOR

The upper point of the protruding part of the front of the auricle

### CAMPER'S PLANE

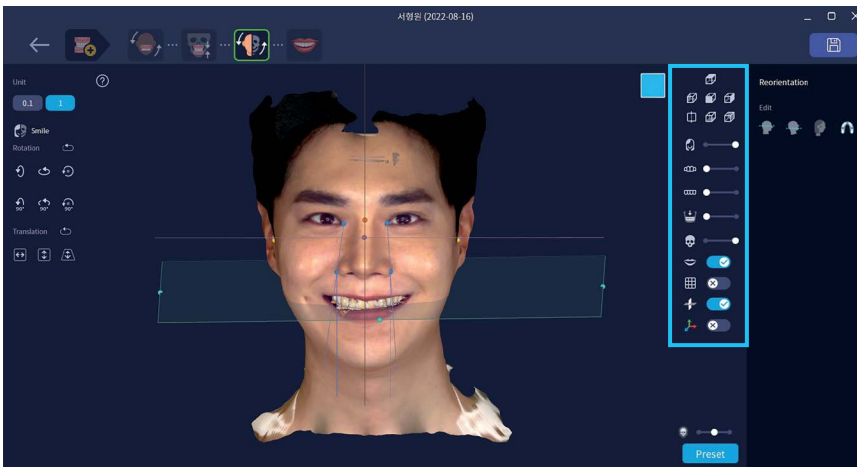
A line from [Tragus superior] to [Alar nasal sulcus], parallel to the occlusal plane

## REORIENTATION



Icon	Reference	Description
		Line orientation by FH Plane
		Line reorientation by Occlusal Plane
		Point reorientation by Hinge Axis
		Surface reorientation by Occlusal Surface

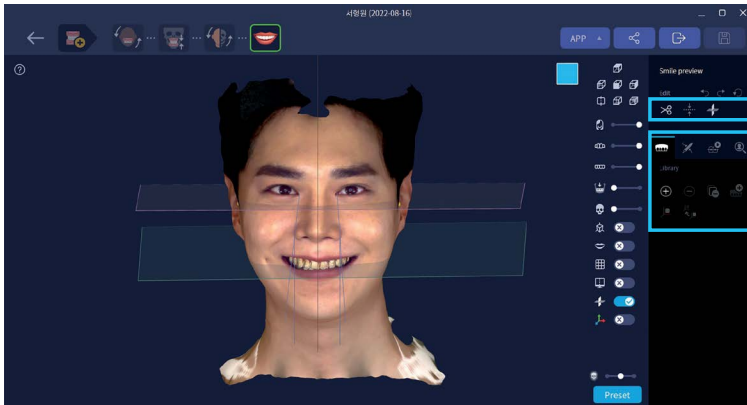
## MENU BAR INTRODUCTION



Icon	Description
	Image view direction
	Face image opacity adjustment
	Upper jaw opacity adjustment
	Lower jaw opacity adjustment
	Lower IOS data (Alignment on CT)
	CT Image opacity adjustment
	Tooth on RAYFace image on/off
	Graticule on/off
	Base line on/off

# SMILE PREVIEW

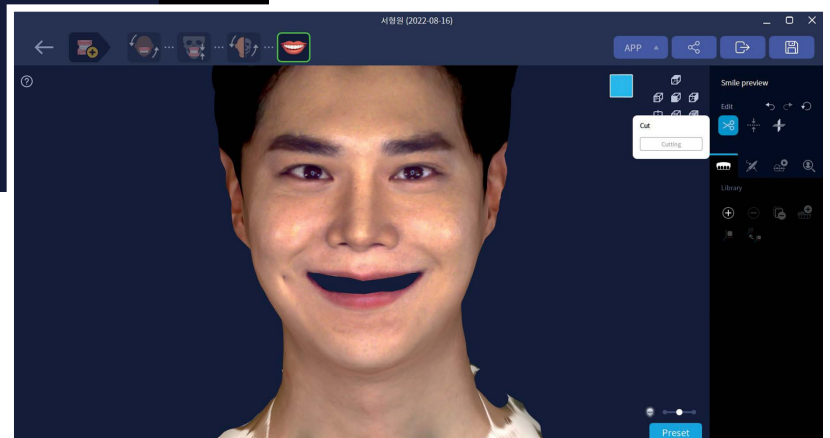
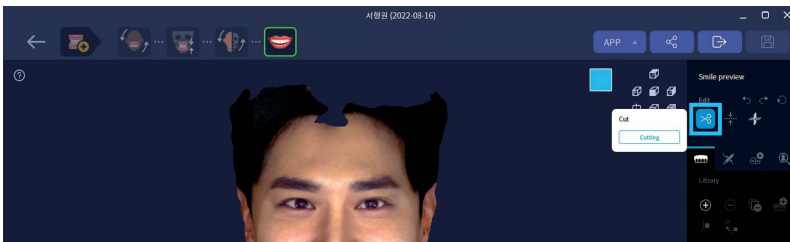
## UI AND MENU INTRODUCTION



Icon	Description
	Crop Lip line - Auto detecting a lip line after click a button
	Data alignment
	Add custom plane
	<b>Library</b> Tooth library list and Simulation
	<b>Design</b> Import designed data from CAD - Grouping between data is available, and the data of group is recognized as one data when used by a 3rd party
	<b>Aligner</b> It's available to check the change of each step by setup data and as a video
	<b>Analysis</b> <ul style="list-style-type: none"> <li>Various data can be registered for patient smile analysis</li> <li>Possible to analyze Dental Avatar data such as teeth and jaw segmentation, articulator, occlusion plan, etc.</li> </ul>


## SMILE SIMULATION - LIP LINE CROP

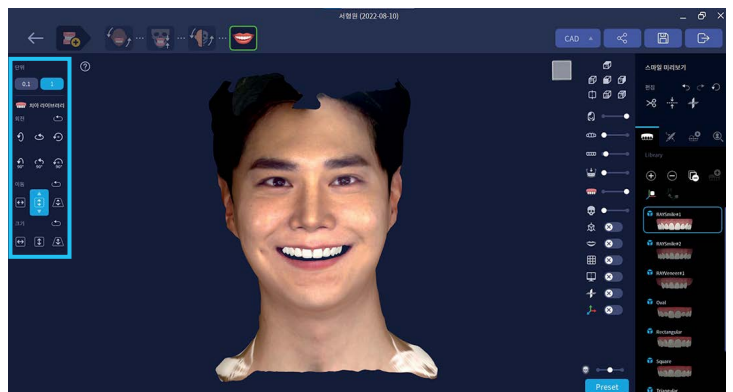
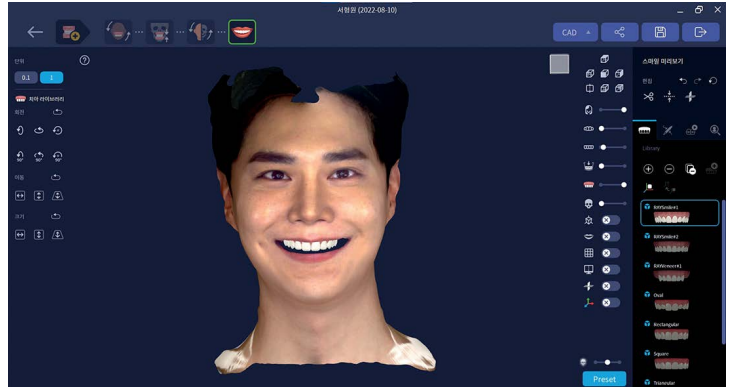
- select icon on the right of the screen lip line will be detected automatically
- micro adjustment : green points can be adjusted
- after clicking, cut' Lip line crop will be completed





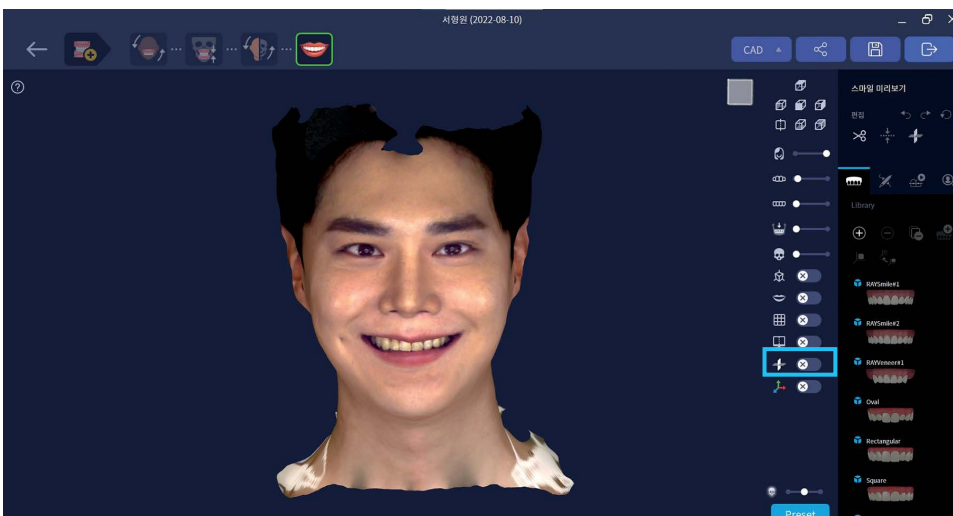
### SMILE SIMULATION - LIBRARY MATCHING

- click again  screen will cut basic view mode (status of IOS data is on -> off)
- select library button on right of screen then pick one you need on the list
- after selecting library you want it will be matched on Lip line automatically by Landmark
- Micro adjustment is available by tool on the left of the screen



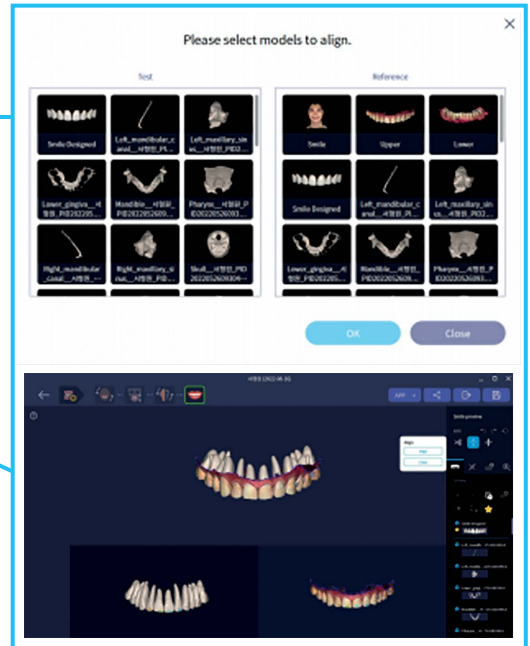
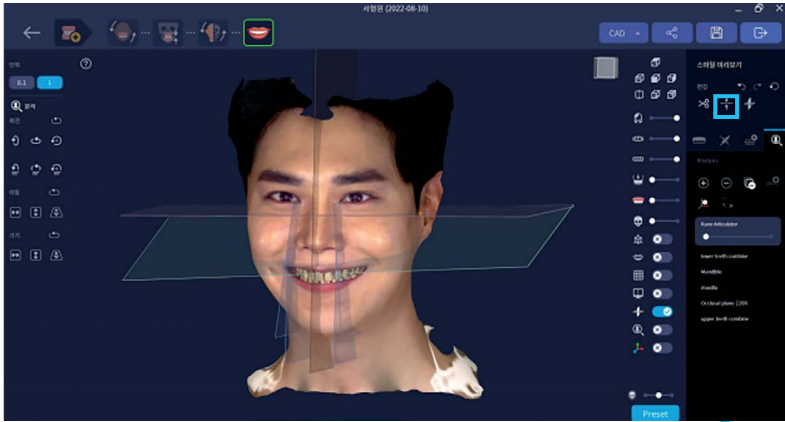
### SMILE SIMULATION - COMPARE BEFORE/AFTER

- By default, the viewer displays the split 2ea and tooth status of the crop on the split view function in the menu bar.
- Can compare a before/after image on split viewer



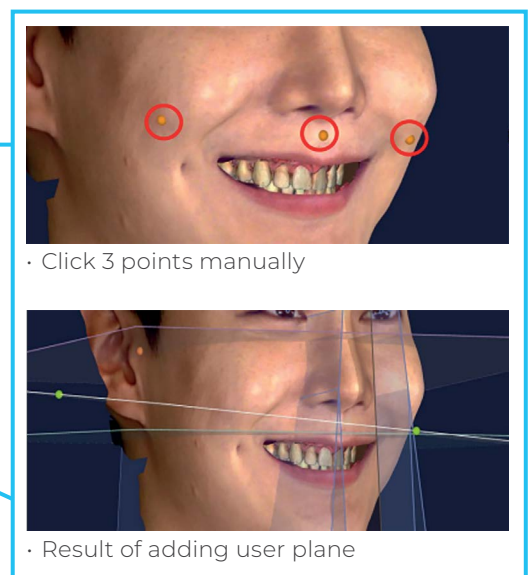
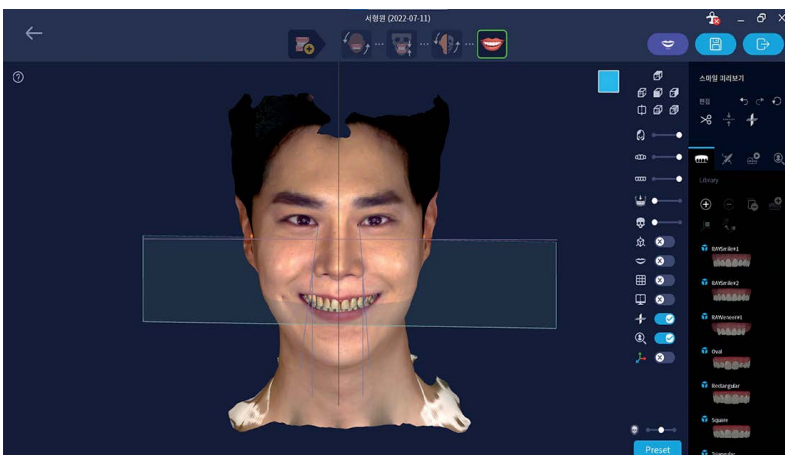
### SMILE SIMULATION - ALIGNMENT FUNCTION

- Display default data when tapping Library, Design, Aligner, Analysis
- Data from test from left and reference from right can be manually aligned (Ex. Upper Teeth Combine Upper jaw IOS data)



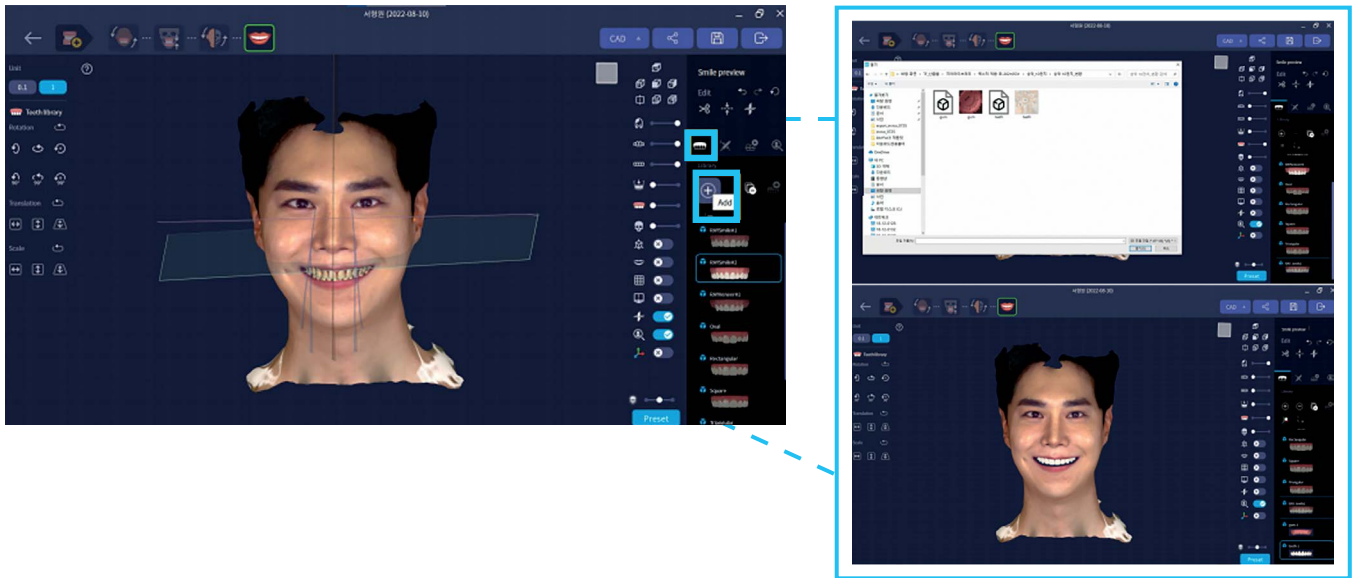
### SMILE SIMULATION - ALIGNMENT FUNCTION

- User can add additional surface area
- It can be generated once choosing 3ea from point to point by user choice



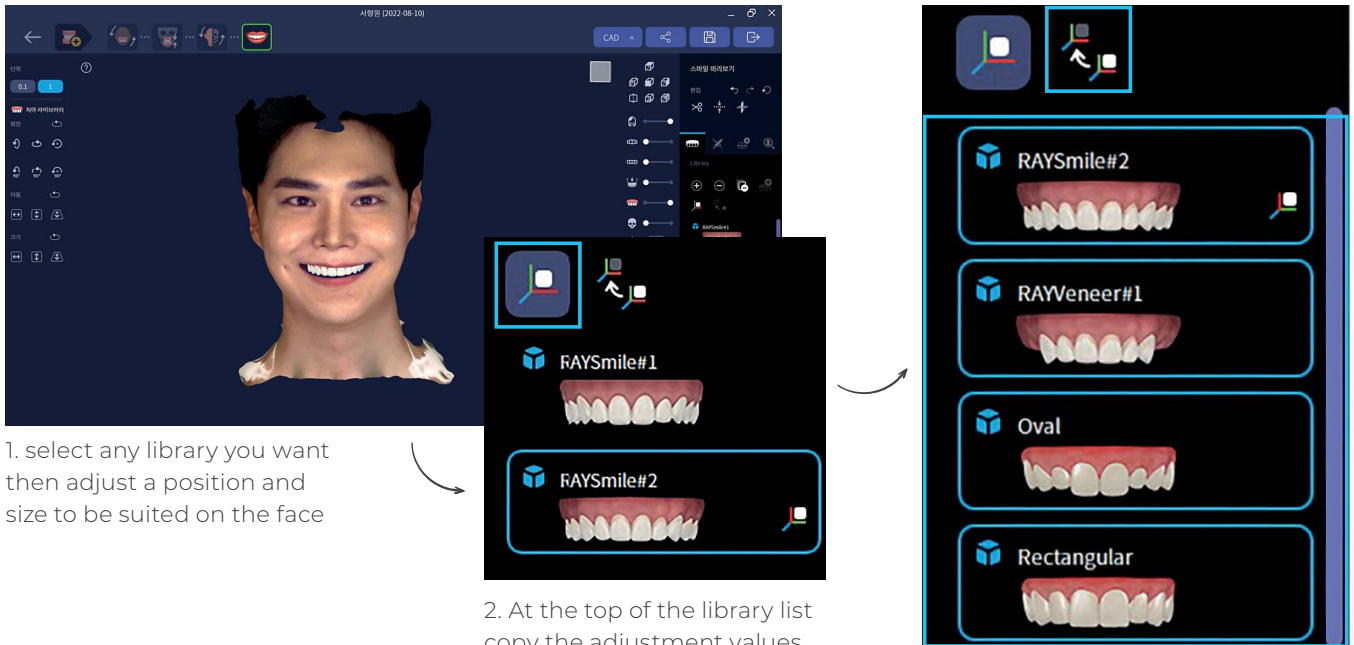
## ADD LIBRARY

- The library data the user owns can be added and used
- Click **+** on top of library then select the file you want to import, It will be displayed on bottom of the list




## USE DATA TRANSFORM FUNCTION


- Convert data copy and paste: Copy and add library value (position/size/coordinate)



1. select any library you want then adjust a position and size to be suited on the face

2. At the top of the library list copy the adjustment values (position/size) after clicking button 

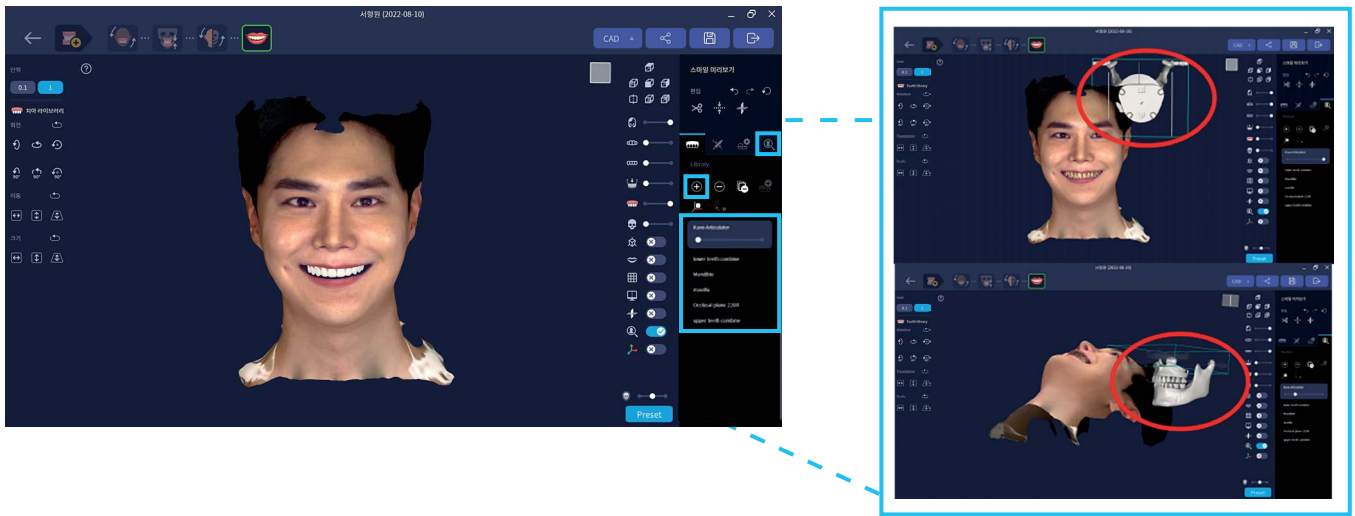
→ A copy mark is displayed at the bottom left

3. Select the library list to which you want to apply the same adjustment value (duplicate selection is possible) and click the Paste button 

→ When simulating the library, the same position/size adjustment values as the copied values are applied.

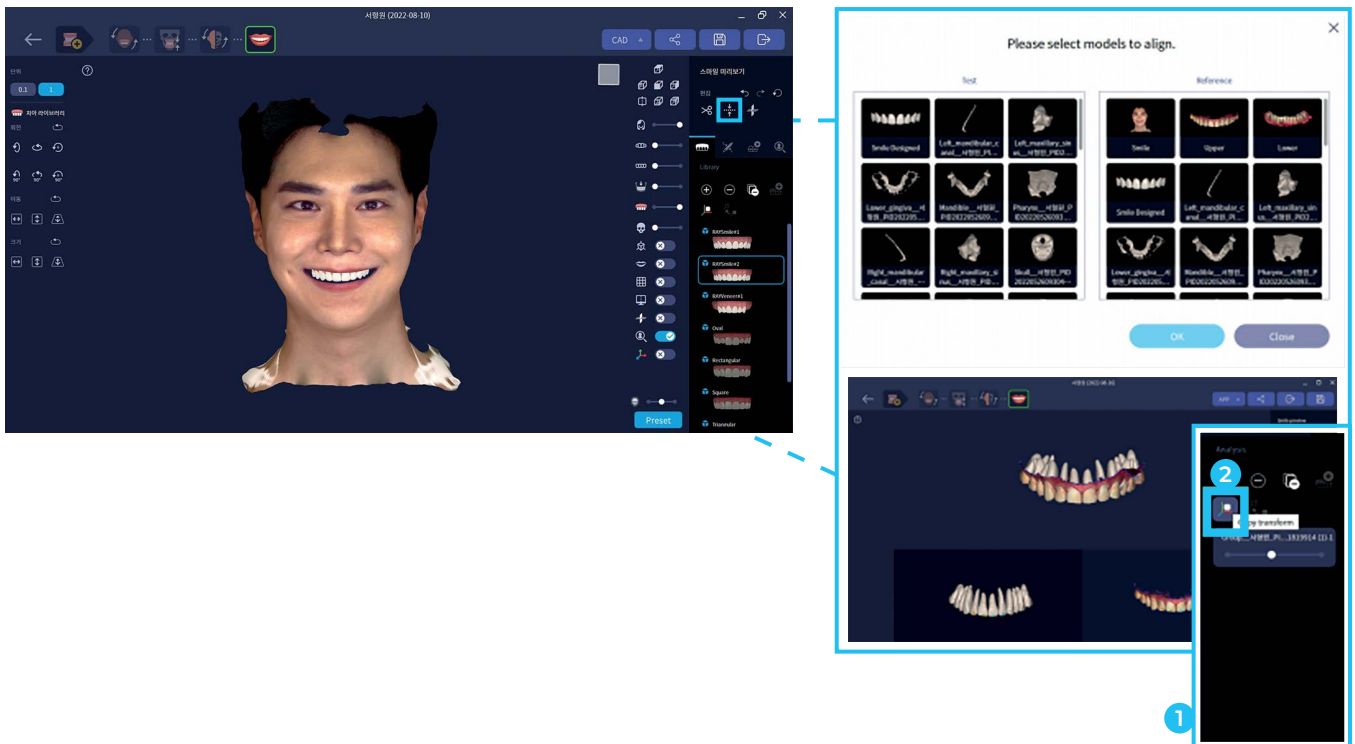
## USE DATA TRANSFORM FUNCTION

- After clicking the **+** button on Analysis, select the file you want to import and import it at the bottom of the tap
- At this time, if the imported files are not matched, they can be matched by Transform function




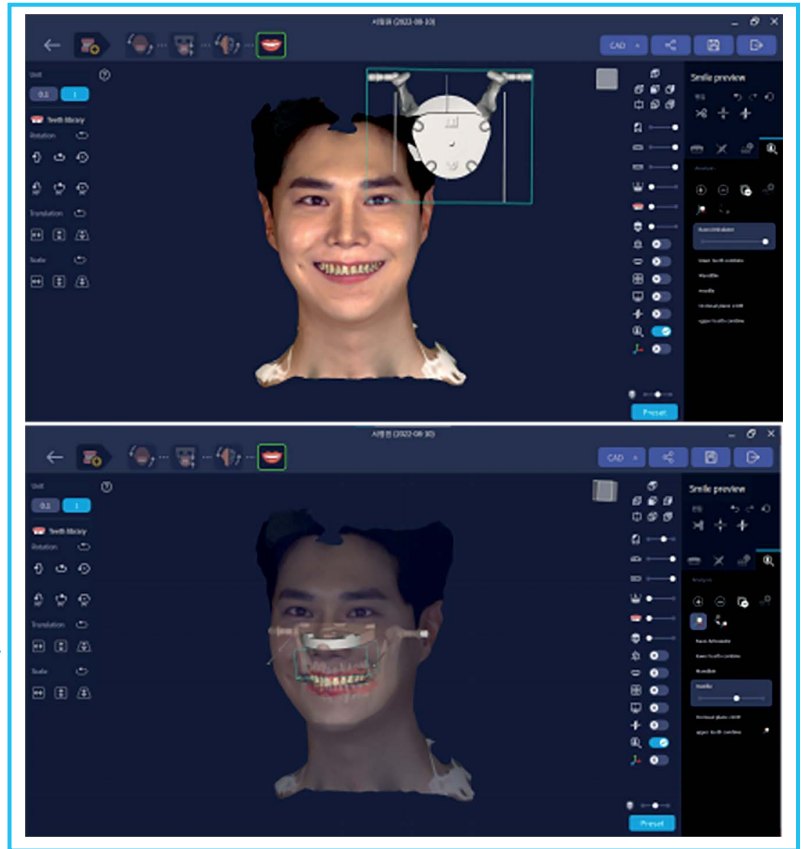
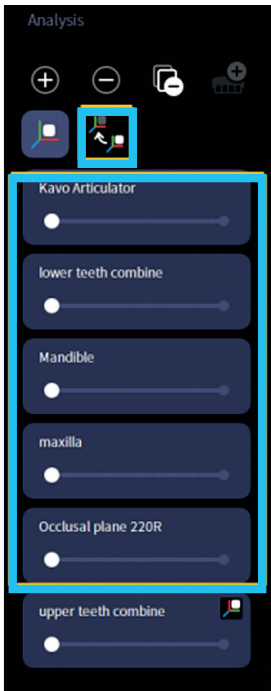
## USE DATA TRANSFORM FUNCTION

- Using the alignment function, complete a alignment for one data set
- After selecting the aligned data set **1** in the list, click the copy button **2**



## USE DATA TRANSFORM FUNCTION

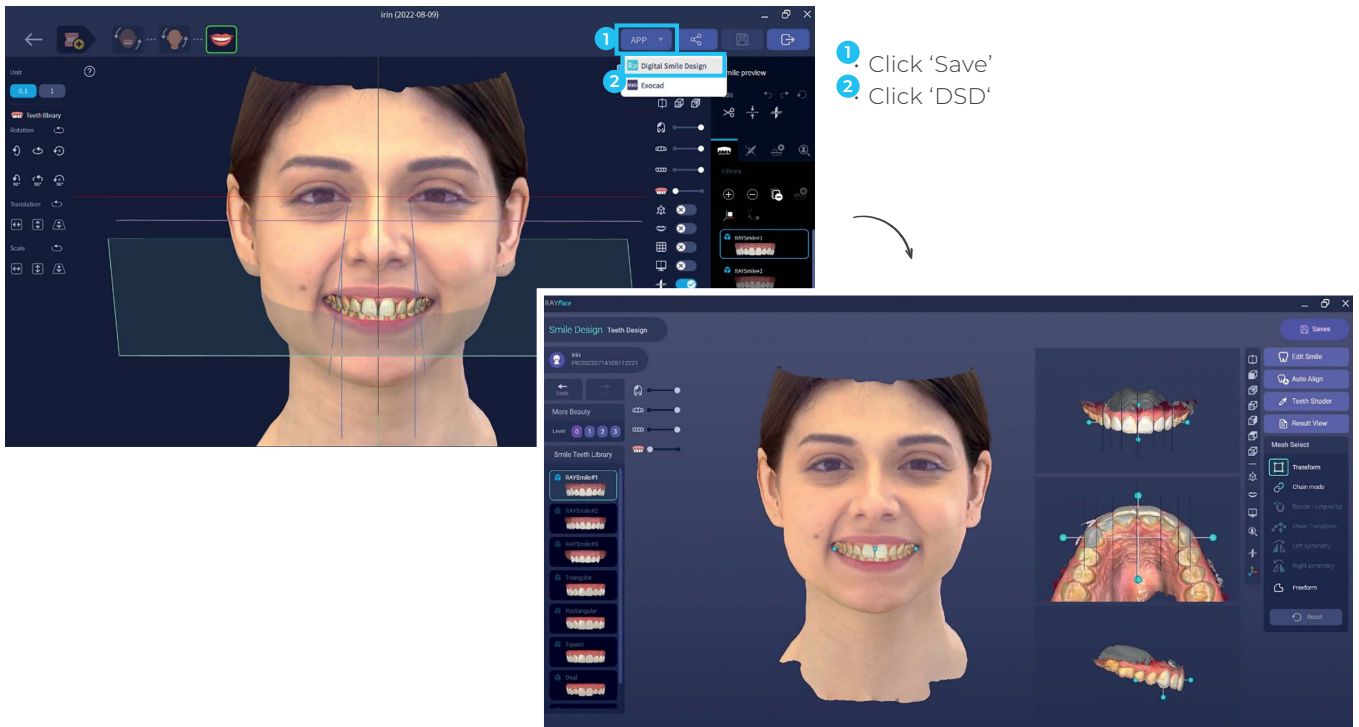
- After selecting all other data lists you want to alignment, click the Paste button 
- The same x,y,z values as those of the data aligned before are applied, and the alignment is proceeded automatically



# DSD

## RUN DSD

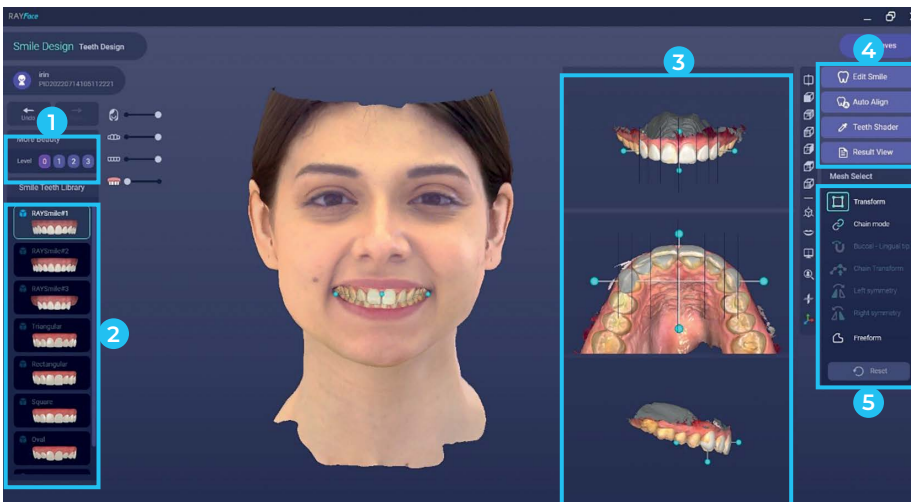
· Save the Project and execute DSD by clicking the DSD Button.



- 1 Click 'Save'
- 2 Click 'DSD'

DSD Screen windows is created

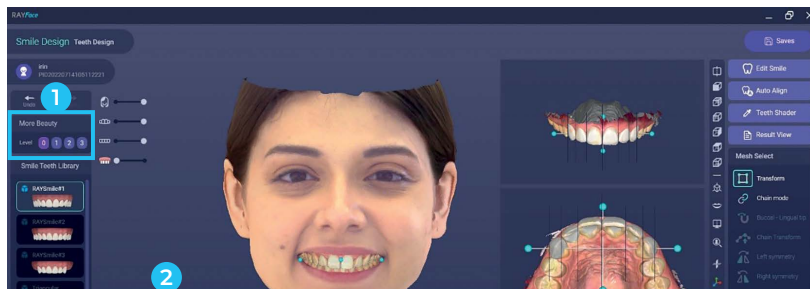
## INTRODUCE DSD UI



Icon	Description
1	More beauty: Adjustment skin tone
2	Library list
3	3D Intraoral view
4	DSD Main tool menu
5	Library control menu

## DESCRIPTION BY FUCTION : ADJUSTMENT SKIN TONE (MORE BEAUTY)

· Skin tone can be adjusted in a total of 4 steps → choose user's preferred level

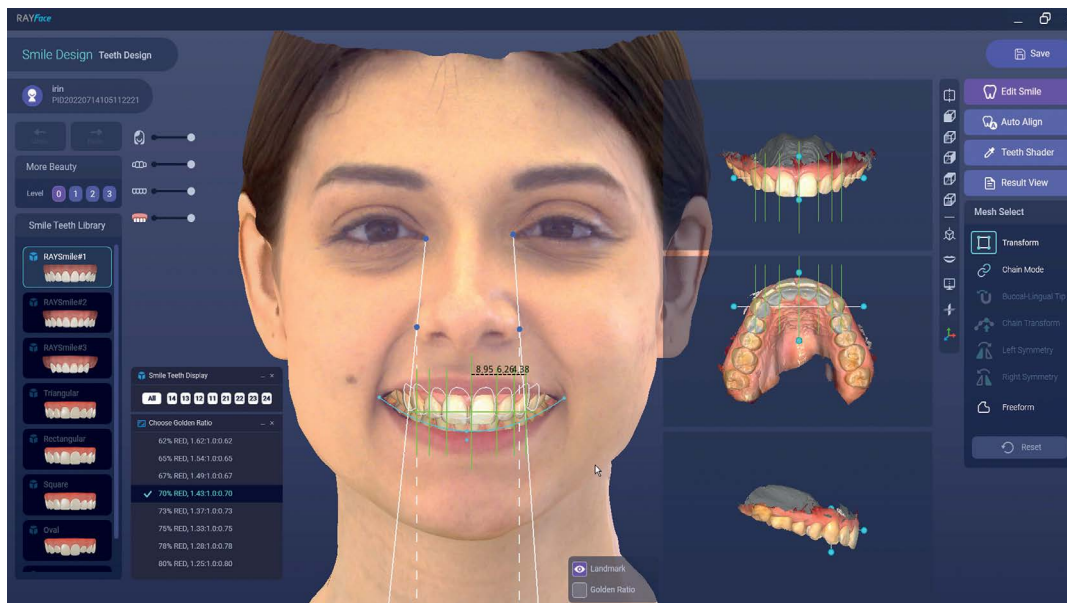


- 1 More beauty - Skin level change function
- 2 Step-by-step changing skin tone



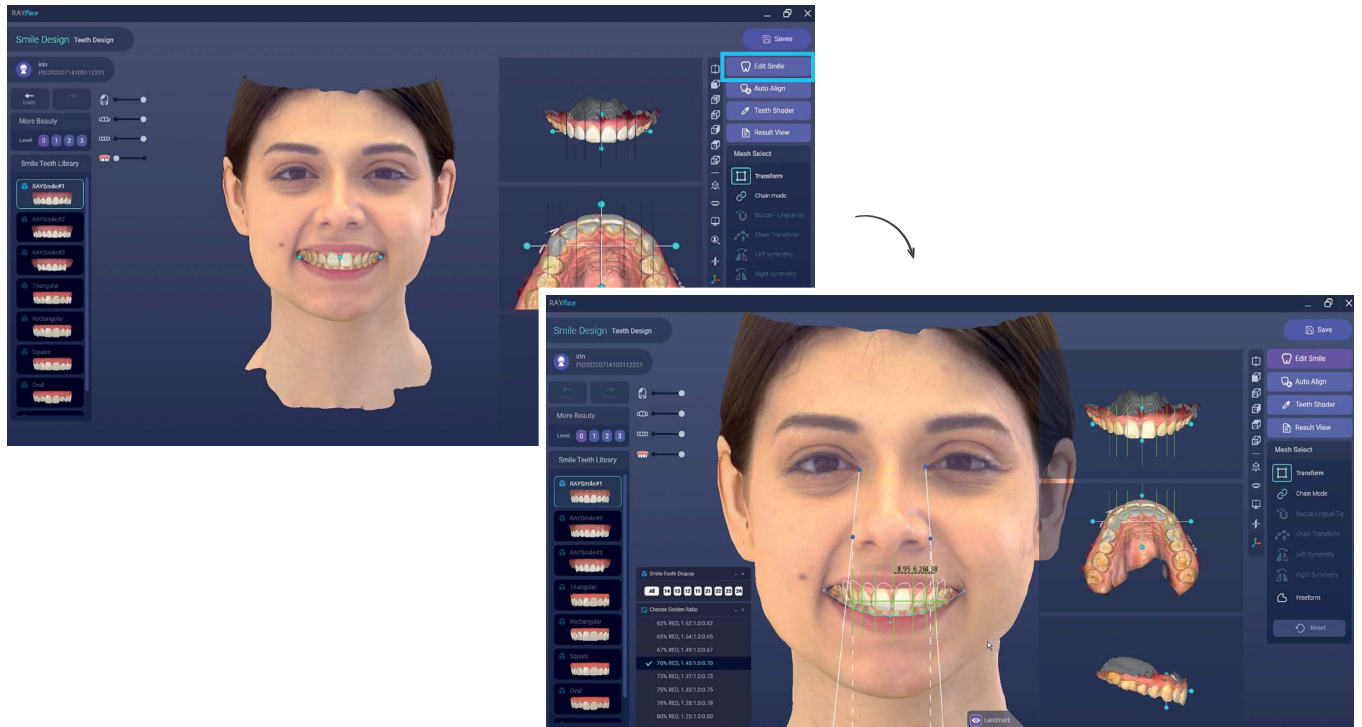
## DESIGN IMAGE

· Automatic creation and fine tuning of Landmark and Golden ratio lines  
 · Individual tooth control function proceeds after deactivating Landmark and Golden ratio

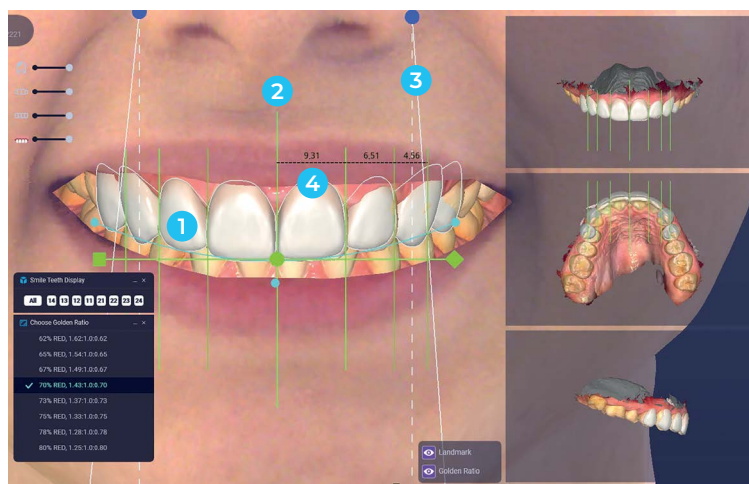


## DESCRIPTION BY FUCTION: EDIT SMILE

- **Automatic creation** and fine tuning of Landmark and Golden ratio lines

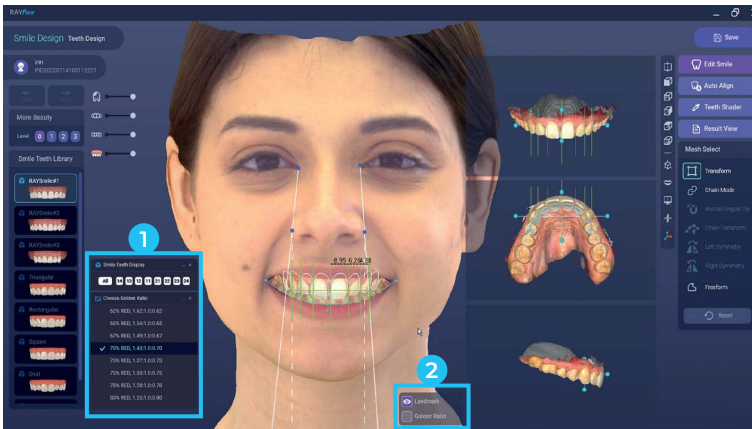


[Automatic creation of Landmark and Golden Ratio]



Type	Description
1	<b>Arch line (Blue line)</b> When Auto Align is executed by adjusting the position with the incisal line, the cutting edge of the library moves in line with the green line.
2	<b>Golden Ratio (Green line)</b> <ul style="list-style-type: none"> <li>• The proportion can be adjusted by moving the green point, and the tooth size changes according to the adjusted proportion.</li> <li>• Change the position by moving the center point and move the library according to the changed position</li> </ul>
3	<b>Inner Canthus to Alar Line (White line)</b> The white dotted line can be moved by clicking the blue dot, and the Golden Ratio is adjusted according to the white dotted line position.
4	<b>Teeth library</b> The size and position are set based on the No. 1 green line and No. 2 yellow line, and the Transformer can be moved.





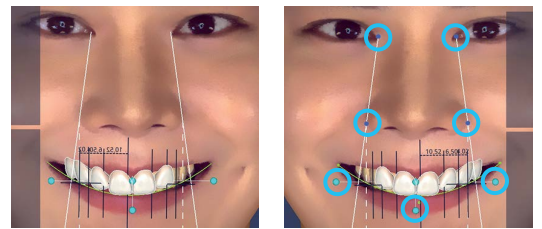
[Fine tuning of Landmark and Golden ratio]

**1 Smile Teeth Display / Golden Ratio**

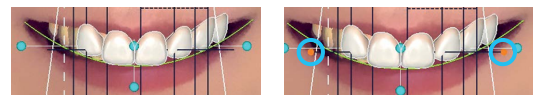
- Display on/off function for each tooth
- Set the appropriate Golden Ratio

**2 Landmark / Golden Ratio**

- Manual adjustment of auto detecting line marking



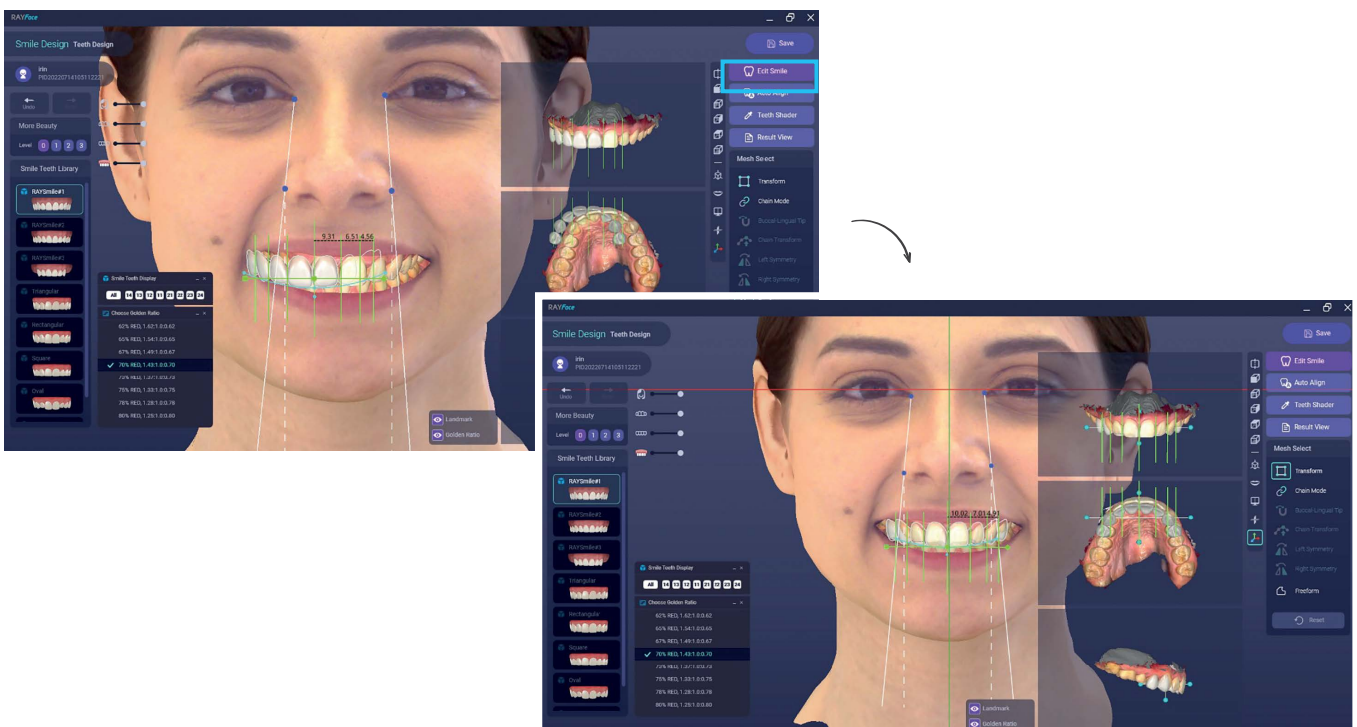
[Landmark on/off]



[Golden Ratio on/off]

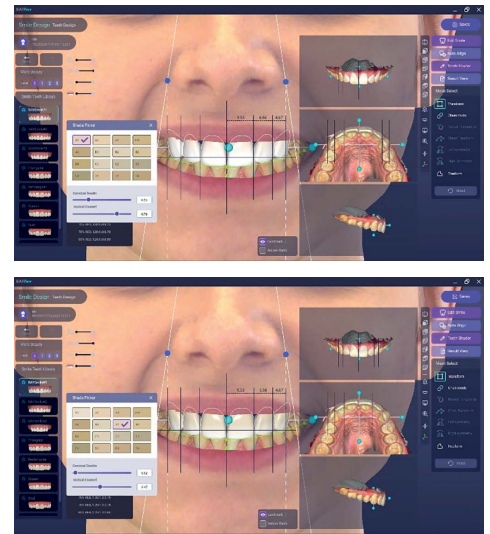
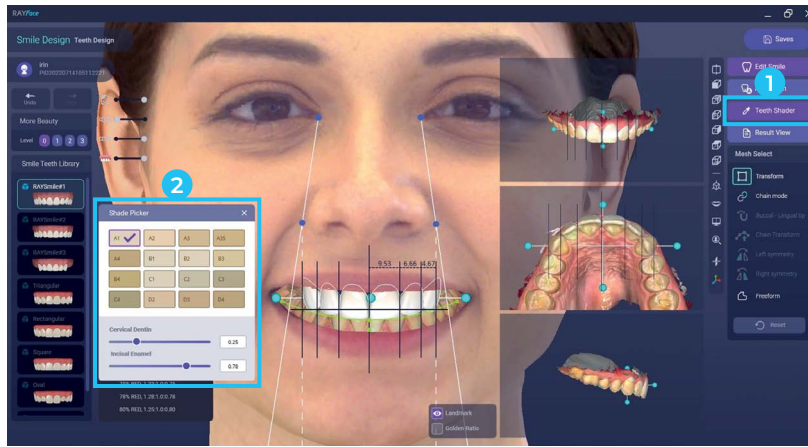
**DESCRIPTION BY FUCTION: AUTO ALIGN**

- Move the selected library location based on the information created and modified in 'Edit Smile'.



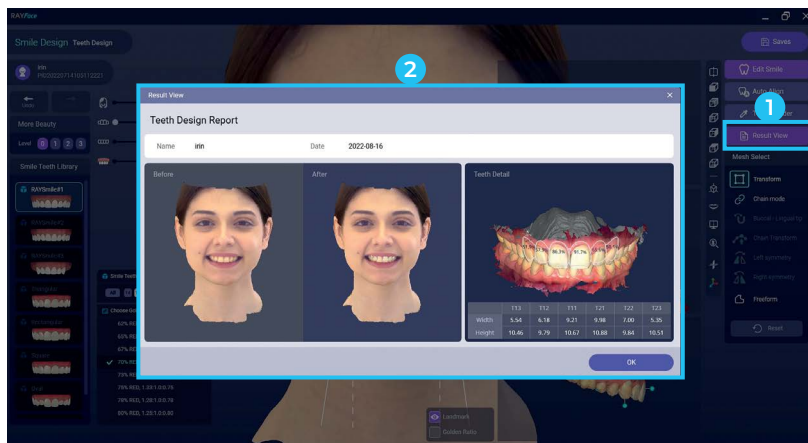
## DESCRIPTION BY FUCTION: TEETH SHADER

- Customize and show various shades in a selected library



## DESCRIPTION BY FUCTION: RESULT VIEW

- The results of before/after treatment (Simulation) are automatically written and displayed as a report.

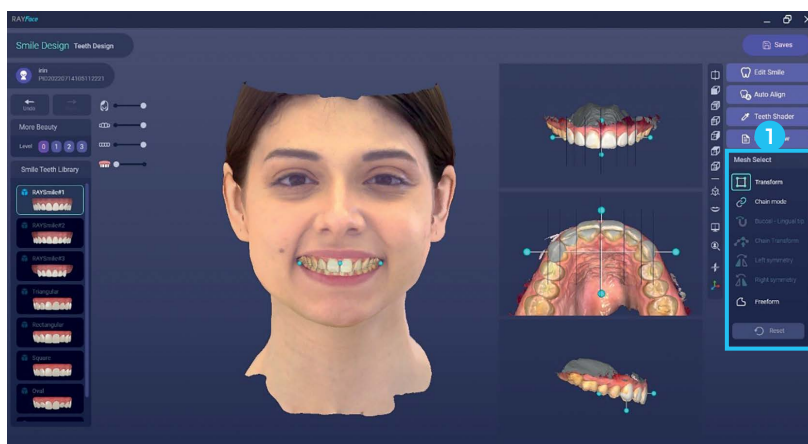


### Auto-generated information

- Image information before/after treatment
- Patient name
- Date
- Tooth design information (width and Height)

## DESCRIPTION BY FUCTION: MESH SELECT

- Adjust library location



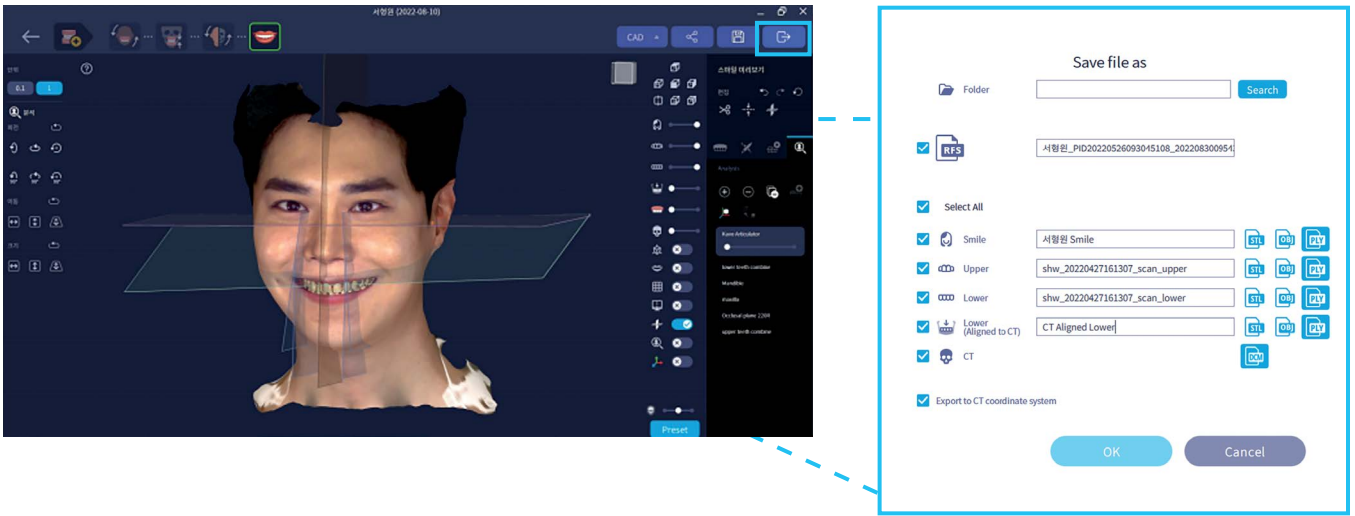
### Mesh select

- Transform : Move the library up/down/ left/right (moving all)
- Chain mode: partial tooth movement
  - Buccal - Lingual tip Library buccal angle correction
  - Chain Transform Individual tooth movement
  - Left symmetry Copy left symmetry
  - Right symmetry Copy right symmetry
- Freeform: free correction

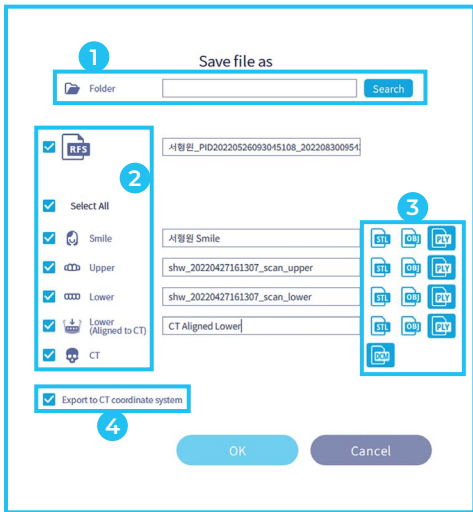
# OTHER FEATURES

## EXPORT DATA : SELECT THE EXPORT DATA BUTTON

· Click the Export button located at the top of the screen and select the type and format of the Image data to export.



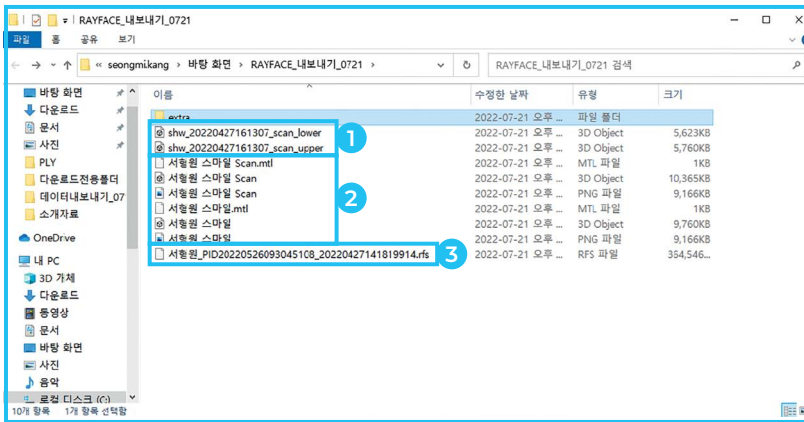
## EXPORT DATA : SCREEN DESCRIPTION



Type	Description	Remark
1	Select the folder to save the exported files.	
2	<p><b>RFS: RAYFace's project file</b></p> <ul style="list-style-type: none"> <li>· A file created by combining all stored data, such as patient information, smile data, upper/lower oral scan data, and CT data, into one data</li> <li>· Use when loading acquisition data from RAYFace installed on another PC</li> </ul>	<p>*Import available only in RAYFace S/W</p> <p>**When the RFS file is called from the initial screen setting, patient information and datas are imported together</p>
3	<p><b>File Format Settings</b></p> <p>After exporting, check and specify the file format that can be utilized by the 3rd party program to be used.</p>	
4	<p><b>Required when exporting to CT Viewer (coordinate alignment)</b></p> <p>When using 3D viewer S/W such as Invivo, Ondemand3D, etc., check it and export to be able to import it with the same coordinates.</p>	

### EXPORT DATA : FOLDER AFTER EXPORT IS COMPLETE (DEFAULT SCREEN)

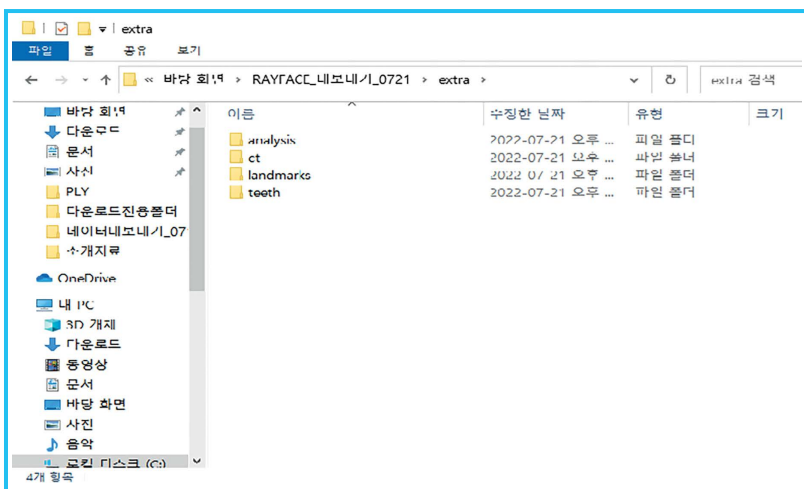
• Check if the exported files are well saved in the specified folder



Type	Description	Remark
1	Oral scanner data	
2	RAYFace data	.mtl is created when exporting to ply format
3	RFS file	When importing from the RAYFace program, all the matched files are loaded at once if only the RFS file is imported.

### EXPORT DATA : FOLDER AFTER EXPORT IS COMPLETE (EXTRA FOLDER)

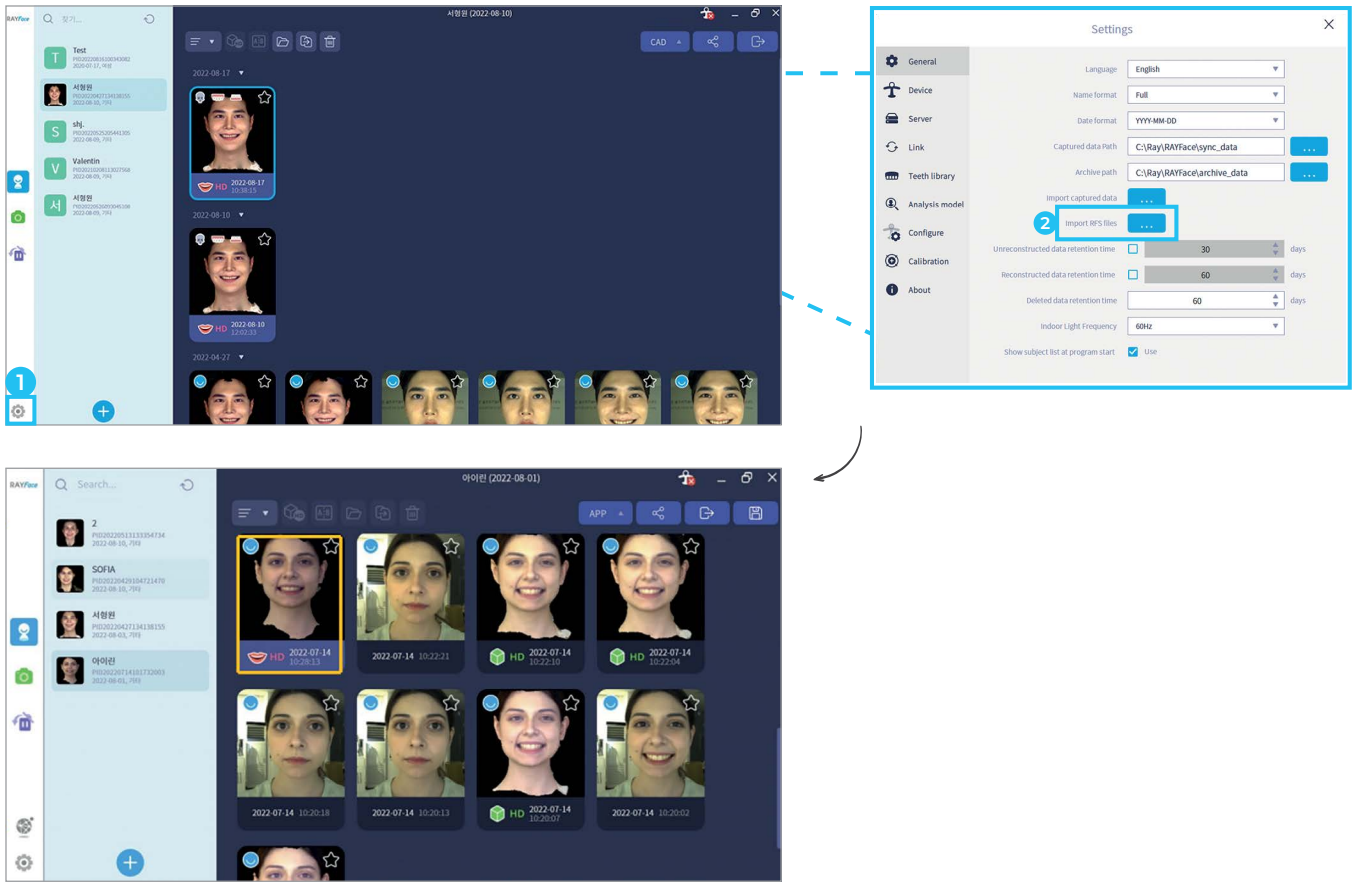
• Check if the exported files are well saved in the specified folder



Type	Description	Remark
Analysis	RAYFace Analysis tab Data	When there is data
CT	CT Data (DICOM)	When there is data
Landmarks	Landmark information created in the Re-orientation tab	
Teeth	Data in RAYFace Library, designer, Aligner tab	When there is data

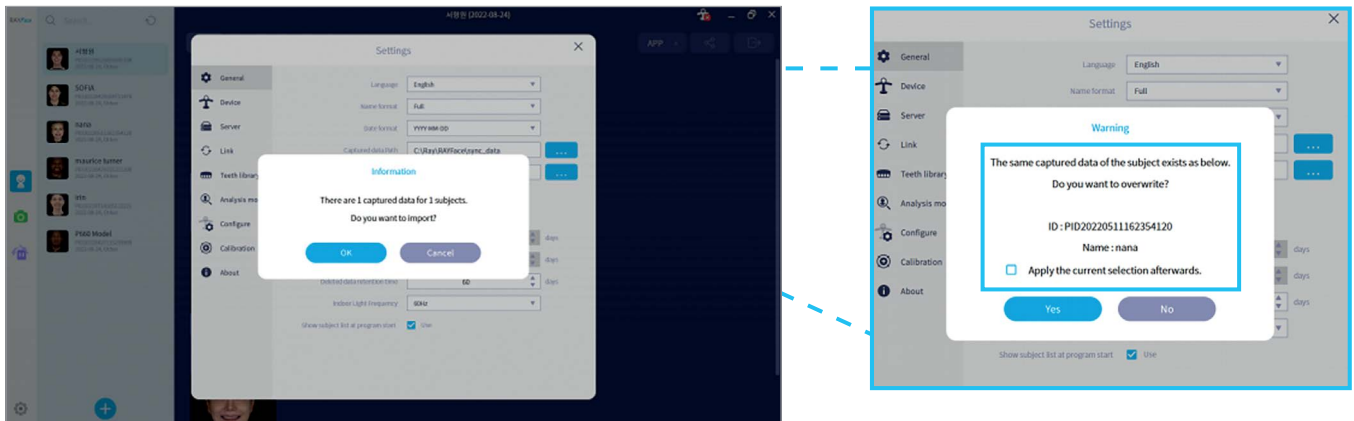
## IMPORT RFS FILES

- Click the Settingstab **1** at the bottom of the patient list to go to the RFS file import screen
- Select 'Import RFS file' **2** to import the file to complete new creation in the patient list (automatically create patient information and patient data)



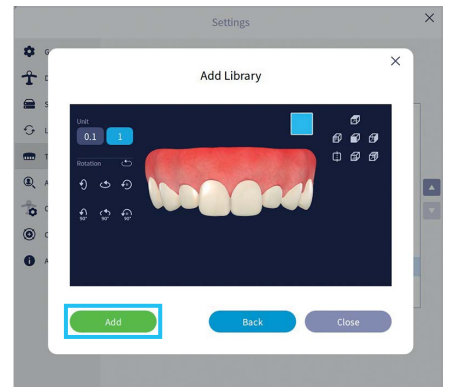
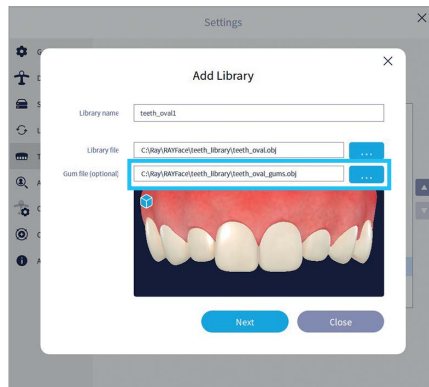
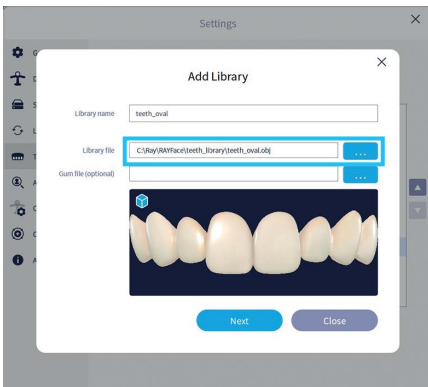
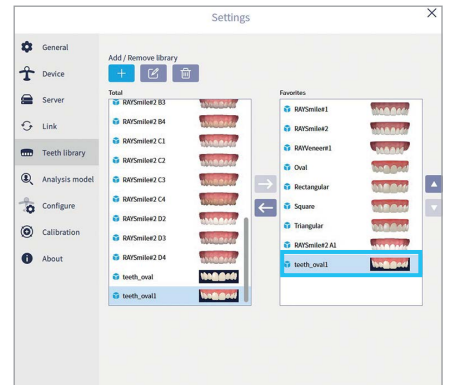
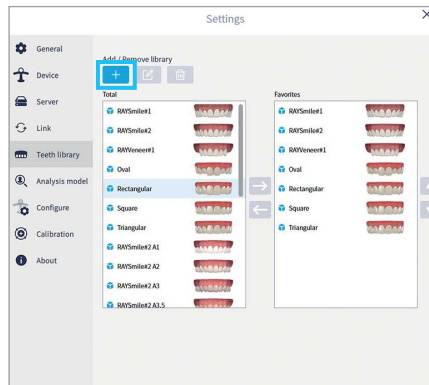
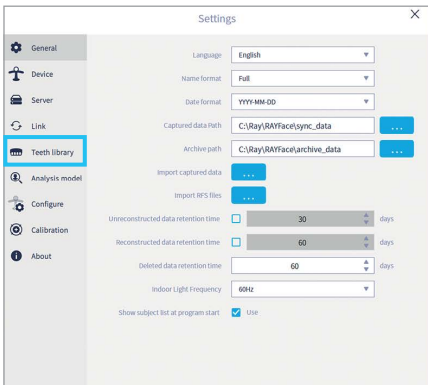
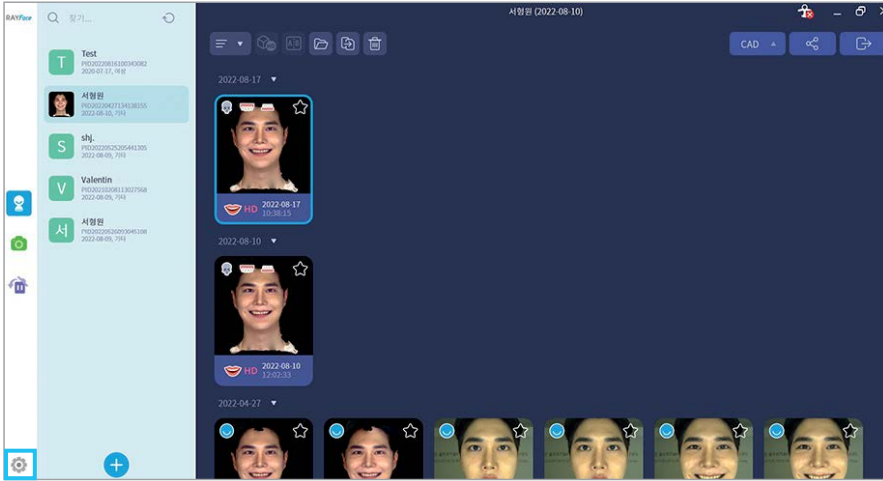
## IMPORT RFS FILES

- If there is data that has the same name and ID as the existing data and was recorded at the same time, a window to confirm to overwrite appears.
- If you select Yes, the data will be overwritten. If you select No, the data import operation will not be executed



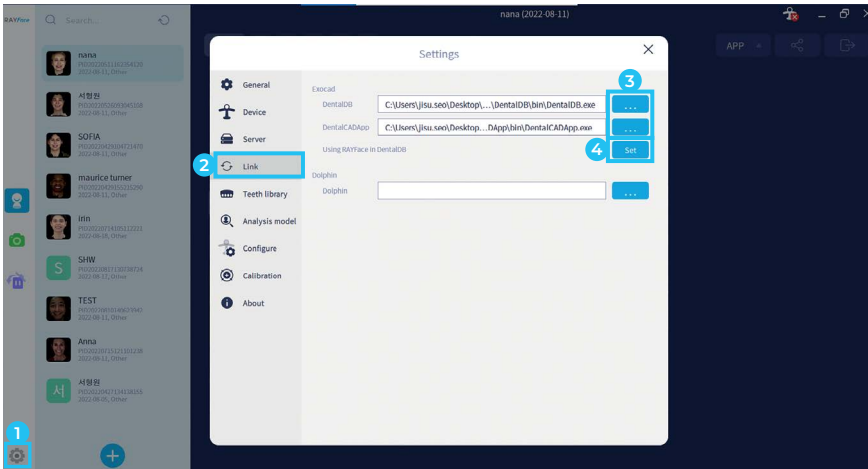
## LOAD LIBRARY

· In addition to the library provided by RAYFace, User owned library data can be added to the master list



## SETTING UP EXOCAD INTEGRATION

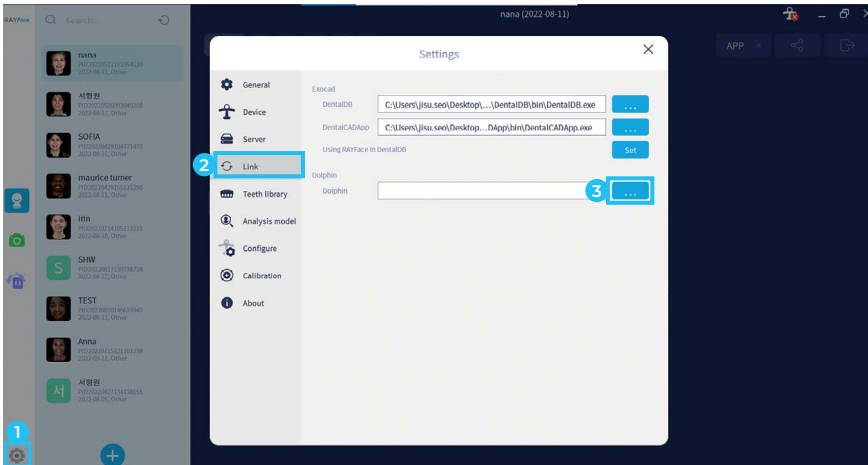
· This intergration is available from Exocad v3.0 or later.



- 1 Click [Settings]
- 2 Click [Link]
- 3 Click [...] to select DB, CADApp.exe
- 4 Click [Set]

## SETTING UP DOLPHIN INTEGRATION

· This intergration is available from Dolphin SW v11.5 or later.



- 1 Click [Settings]
- 2 Click [Link]
- 3 Click [...] to select DB, Dolphin.exe



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