Automatic Jaw Motion Tracking &Analysis Software

User's Manual

2019.8

Rise Corporation

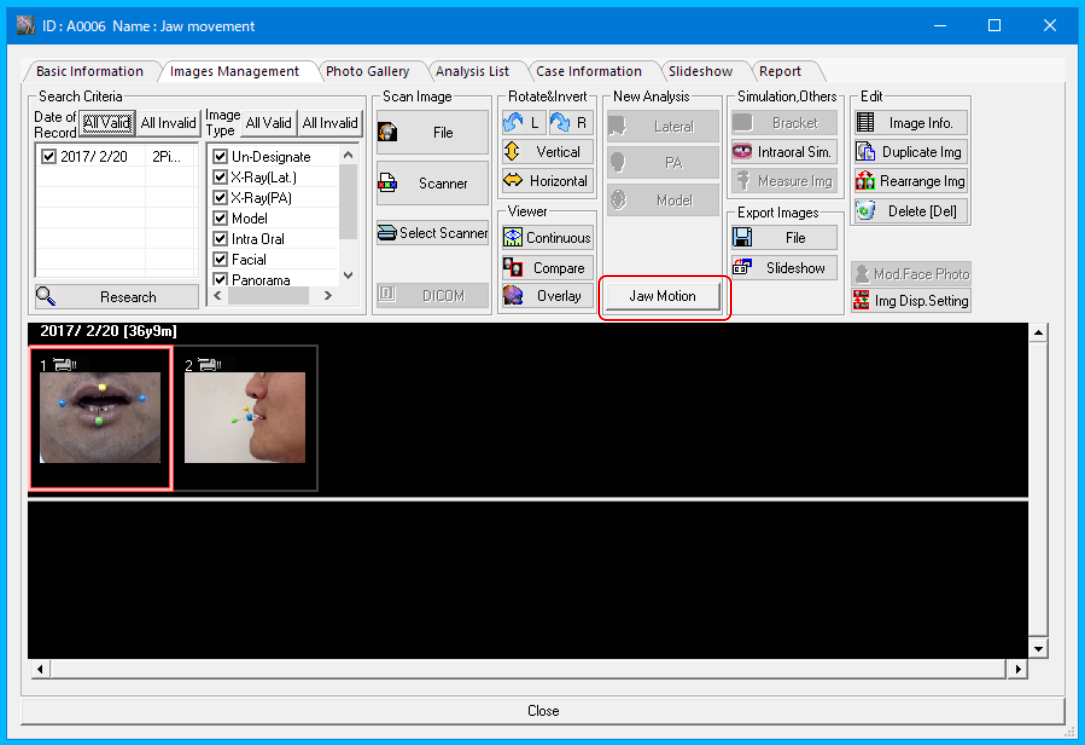
Contents

1. Create Analysis Data

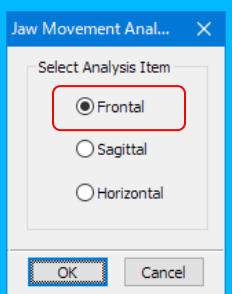
The software can analyze frontal, sagittal, and horizontal movements from Movie.
Combining frontal and sagittal planes of analysis data can analyze horizontal and 3D data.
However, in the case of compositing, it is necessary to match the simultaneous shooting and the analysis start frame.
In the case of 3D data, it can be synthesized with the average data obtained from frontal and sagittal analysis.

1-1. Analysis from Movie

Create patient analysis data.
Import the movie you shot in advance to WinCeph.
Create analysis data of frontal plane.

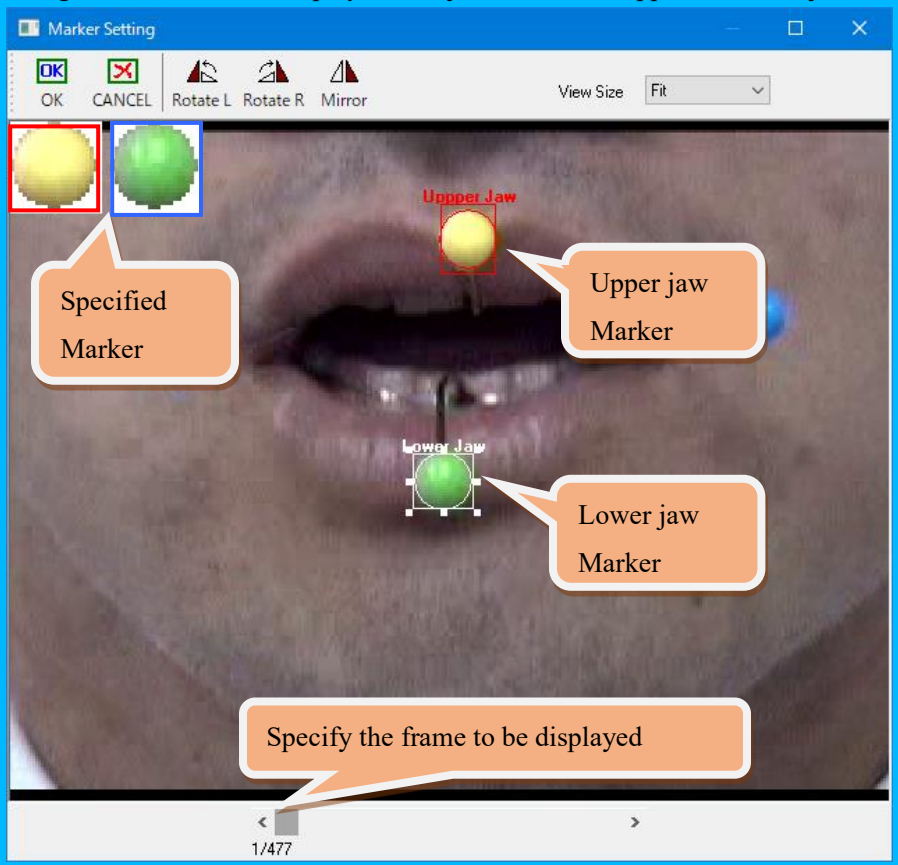


In the image management screen, select the captured frontal movie and click [Jaw Motion].



Then select [Frontal] and click [OK].
(To create a [Sagittal] plane or [Horizontal] plane,
just select each item on the left screen.
The procedure is the same.)

The [Marker Setting] dialog is displayed, displaying the first frame of the movie.
Designate a marker that displays the trajectories of the upper and lower jaws.



Use the mouse drag, enclose and set the markers in order of upper and lower jaw.
(The center of the marker is reflected in the trajectories of upper and lower jaws)

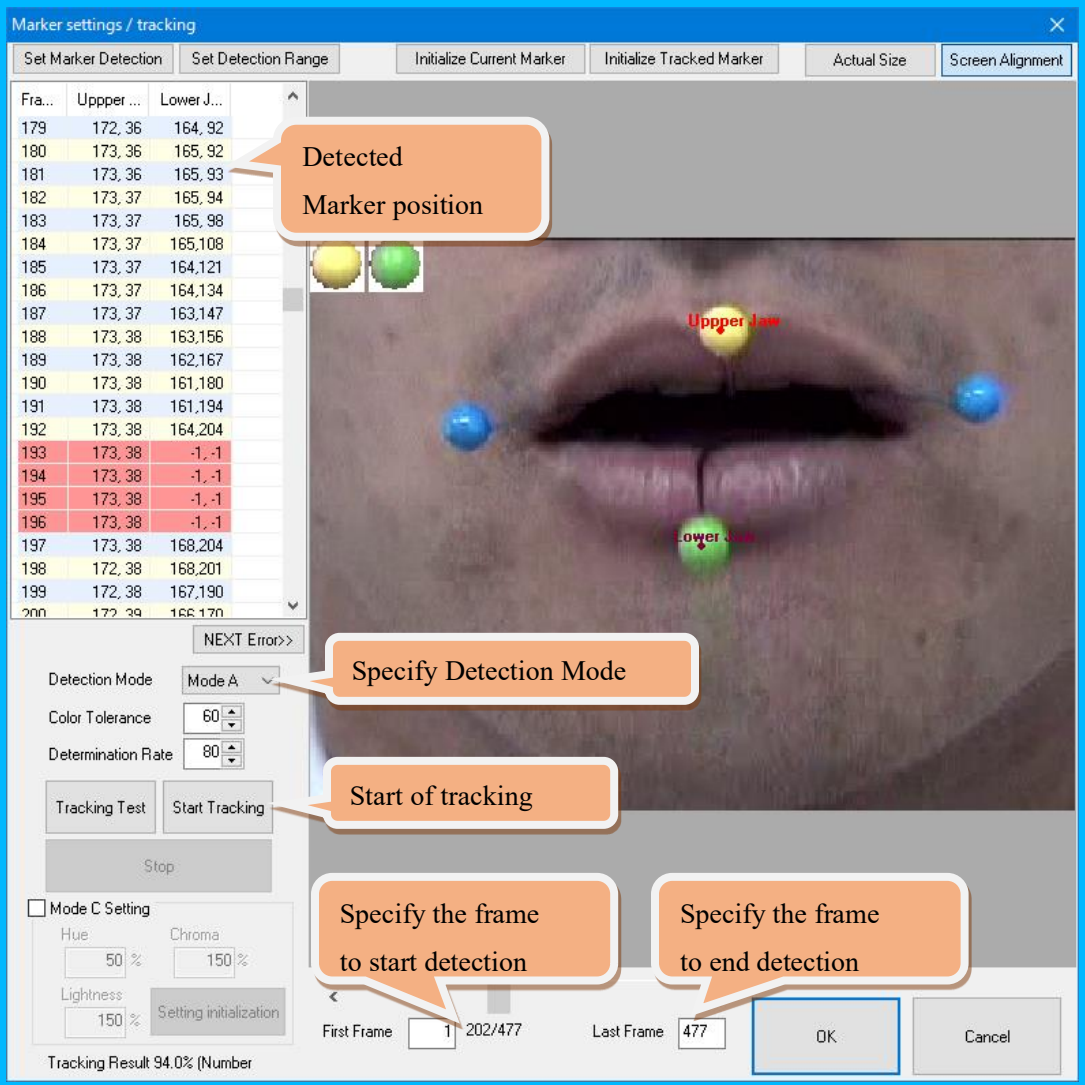
The upper right of the screen [Display Size], the larger the number, the screen will be larger, and it will be easier to specify the marker.
When setting is complete for both upper and lower jaws, click [OK].

*When setting the marker, if it is difficult to specify the marker for the first frame image (due to blurring of the image, etc.), change the frame with the scroll bars at the bottom of the screen and specify the marker with clear frame of the image.

*left rotation and right rotation are used; image analysis data can be created even when the camera is used vertically.

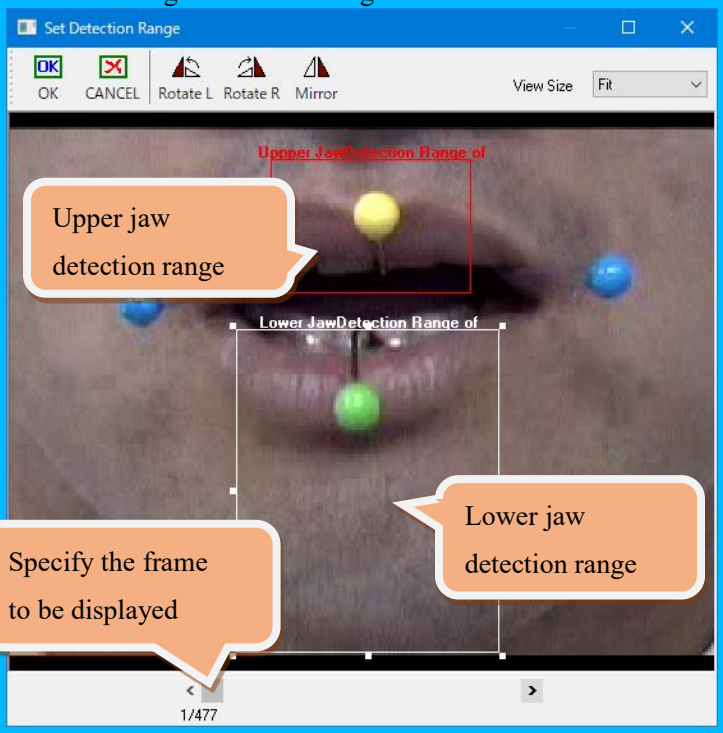
*Mirror…Perform left-right reversal.

Next, the “Marker Setting / Tracking" dialog is displayed.
Click [Start Tracking] to track the set marker.
(For a detailed explanation, please refer to {2. Refer to Patient Analysis Data})
Start tracking and acquire markers for all upper and lower jaws for each movie.



When tracking is complete, the list on the left of the screen shows the frame number and the position of the upper and lower jaw markers on the screen.
Depending on the shooting conditions, markers may not be detected properly.
In this case, try switching the detection mode or changing the tolerance value.
When setting the detection mode to [Mode B], it is necessary to set the marker detection range.

* Setting of detection range



Specify the movement range of the upper and lower jaw markers by mouse drag with the [Set Detection Range] .

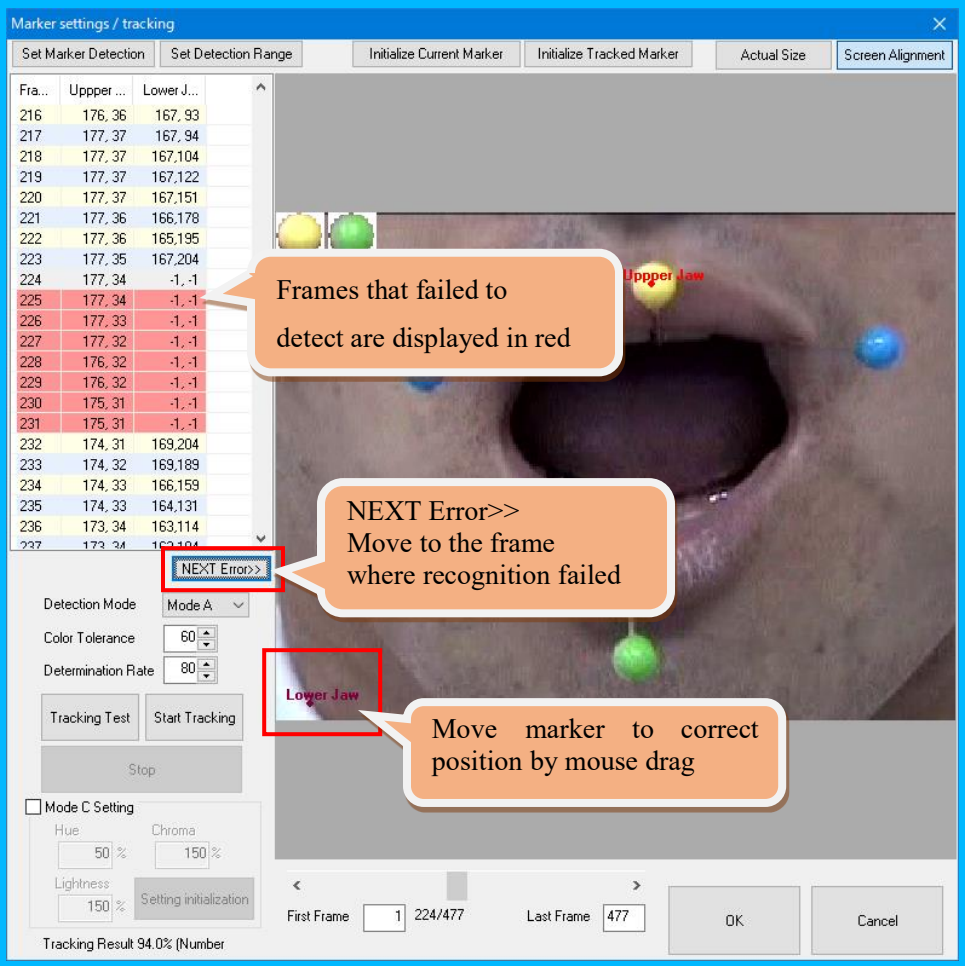
Scroll bar and [<] [>] can change the frame of the movie.

When complete,
click [OK].

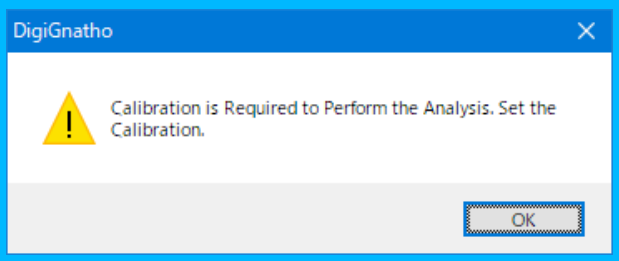
After changing the detection mode or range setting, click [Tracking Start] again.
When tracking is complete, click [NEXT Error] to check for marker acquisition errors.

Frames with errors (frames for which markers cannot be set) are displayed in red in the left list. (Position display is -1)
If there are many errors, change the detection settings etc. and try again.

In addition, if you want to analyze only a specific part of the movie,
please specify [Start Frame] and [End Frame].



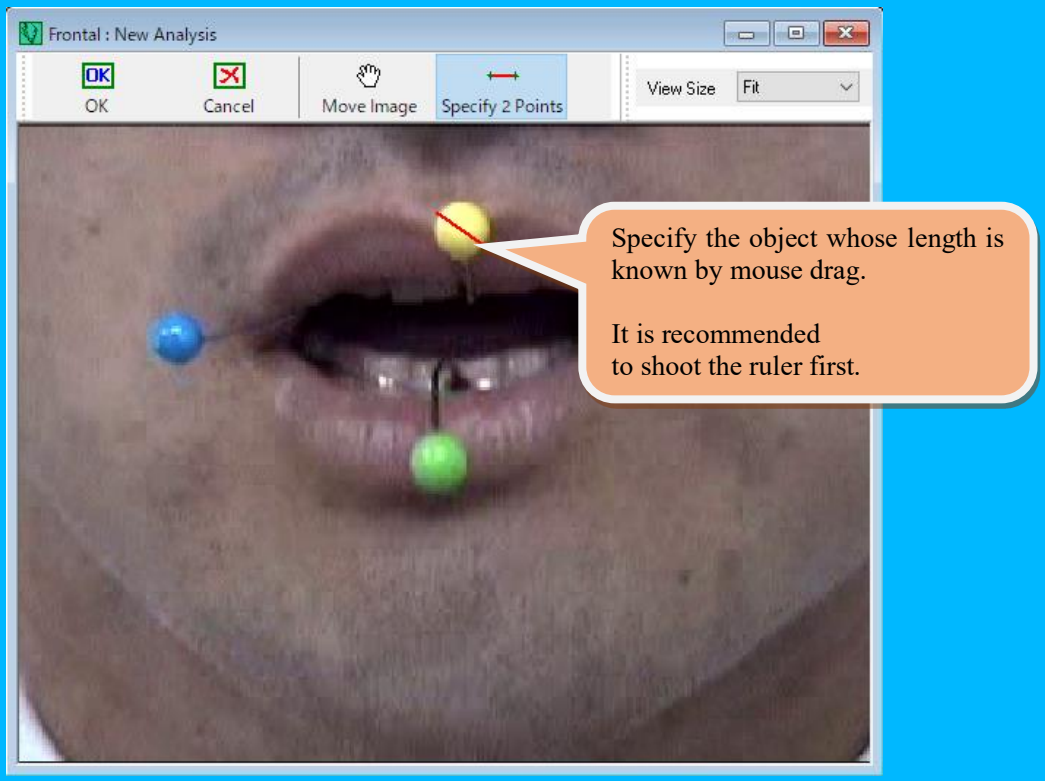
The error frame is displayed, and the marker that failed to be detected is displayed on the left of the screen.
Move the upper and lower jaw markers to the respective marker positions with mouse drag.
Click [NEXT Error] again after manual marker setting. Repeat the manual marker setting until there are no errors. Click [OK] when there are no errors.



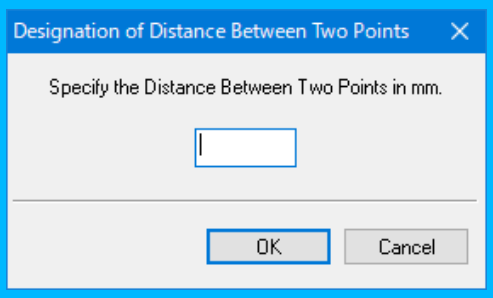
This dialog will be displayed.

Click [OK] to set the calibration.

Calibration setting screen is displayed.

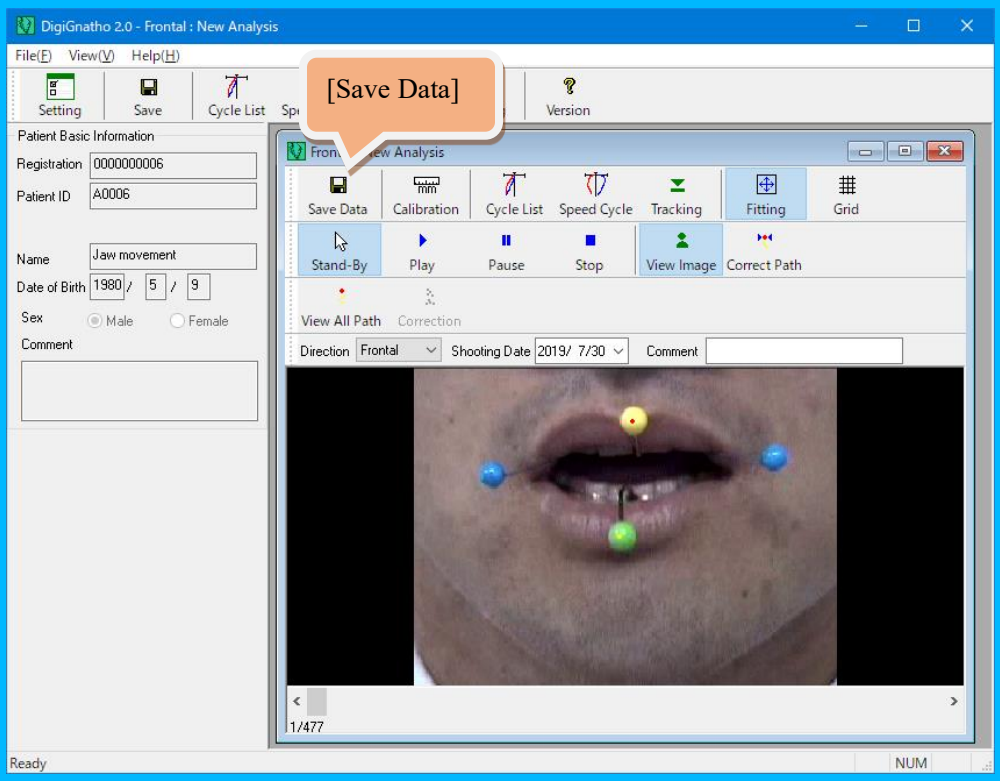


Make [Specify 2 Points] pressed. (It is pressed in the initial state)
The mouse pointer changes to a green cross on the image, so drag the mouse according to the object whose length you can see (scale, marker, etc.).
You can also change the [Display Size] on this screen.
As it gets bigger the [View Size], you can more accurately "distance designation".
(If [Move Image] is pressed, the image can be moved by dragging the mouse.
It is used to scroll the screen when the image size is bigger.)
Click [OK] when [Specify 2 Points] is complete.



Enter the length
between the two specified points
in “mm” and click [OK].

As the "Frontal" dialog is displayed, click [Save Data] to save the data.

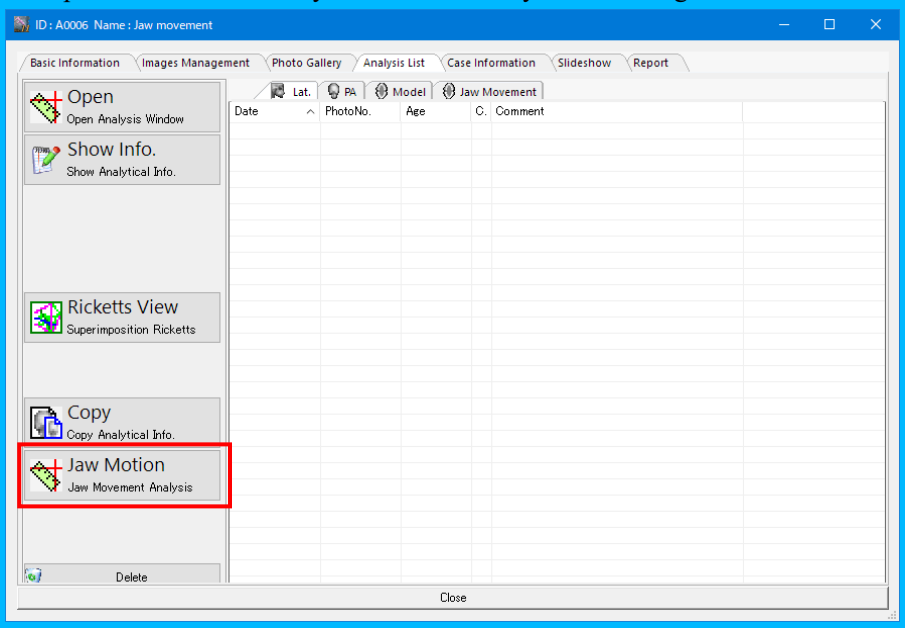


The same analysis applies to sagittal planes and horizontal planes.

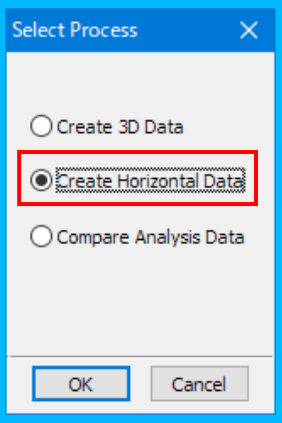
1-2. Synthesize Analysis Data

(1) Horizontal Composition

Using analyzed frontal and sagittal plane data, it is effective only when the animation of each plane is simultaneously shot and the analysis start is together.

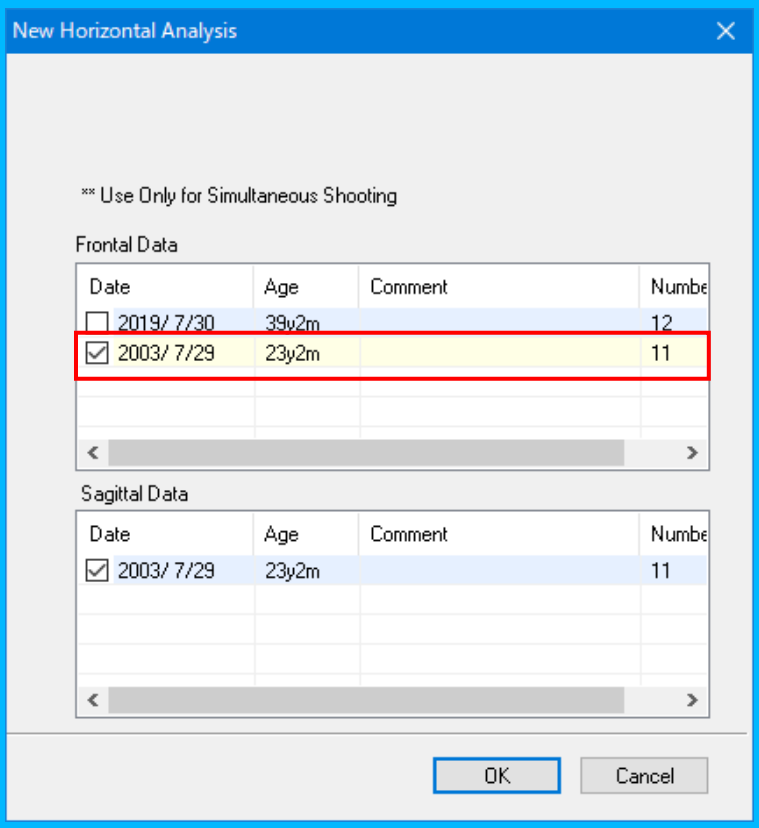


Click [Jaw Motion] from the analysis list.

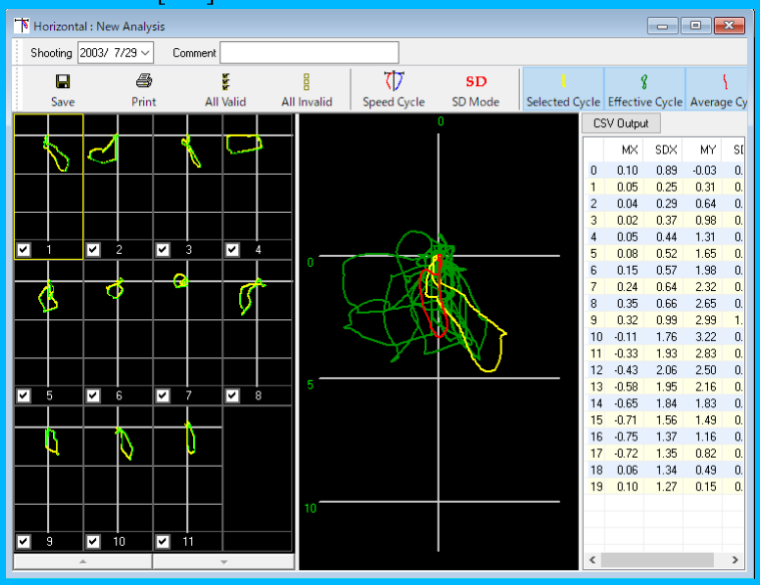


Select [Create Horizontal Data] and Click [OK]

A screen for selecting the data to be synthesized is displayed.

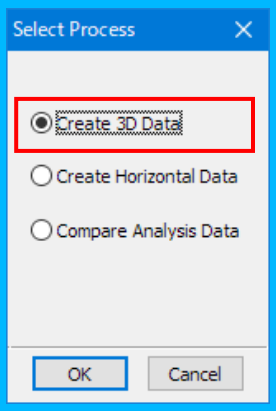


Check the frontal and sagittal data taken simultaneously, and click the [OK] .

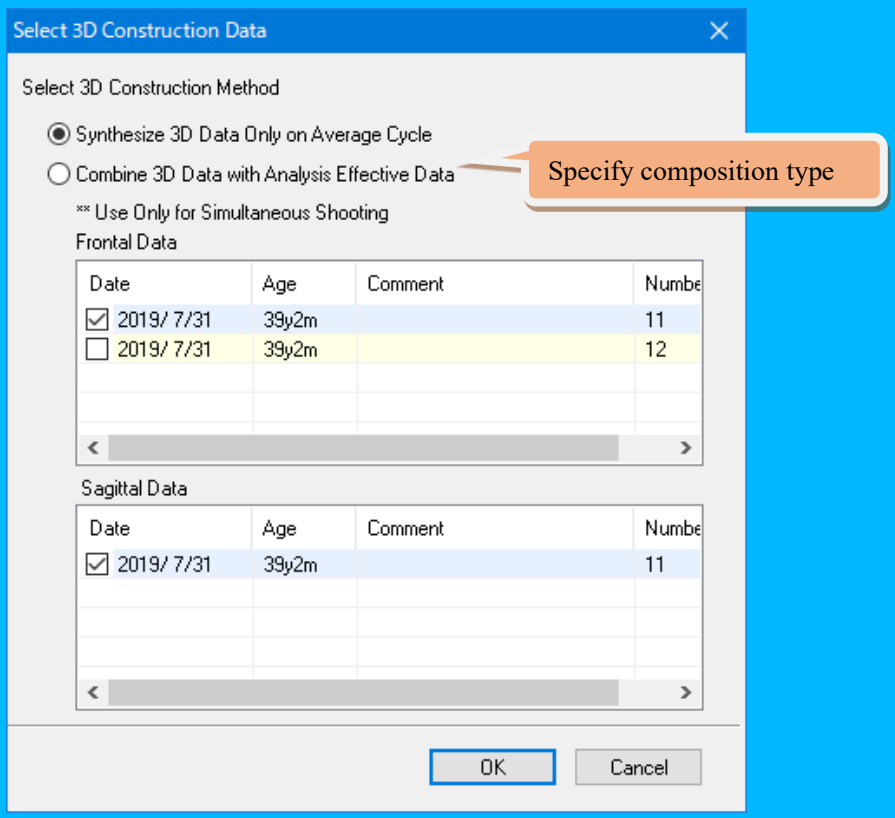


Analysis results of the combined horizontal plane are displayed.

(2) 3D View



Click [Jaw Motion] from the analysis list, select [Create 3D Data], and click [OK].

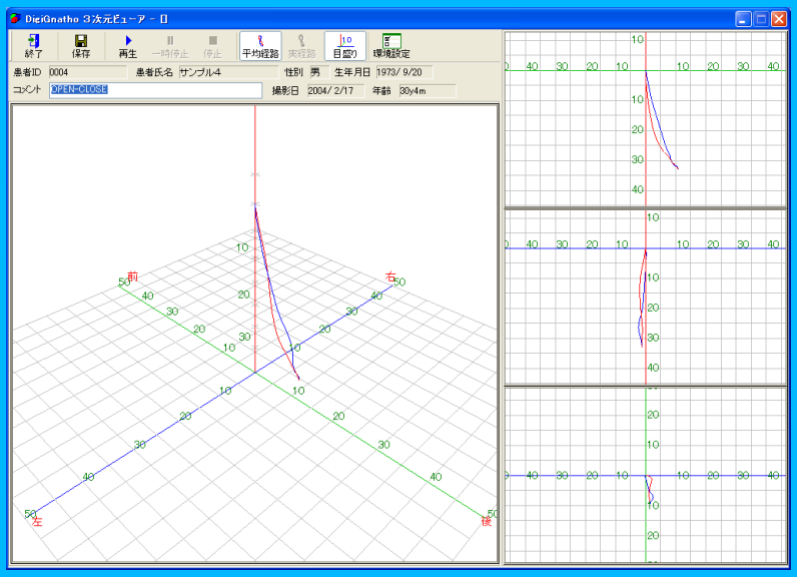


* “Synthesize 3D Data Only on Average Cycle” allows 3D compositing even if the frontal and sagittal movies are not shot simultaneously.

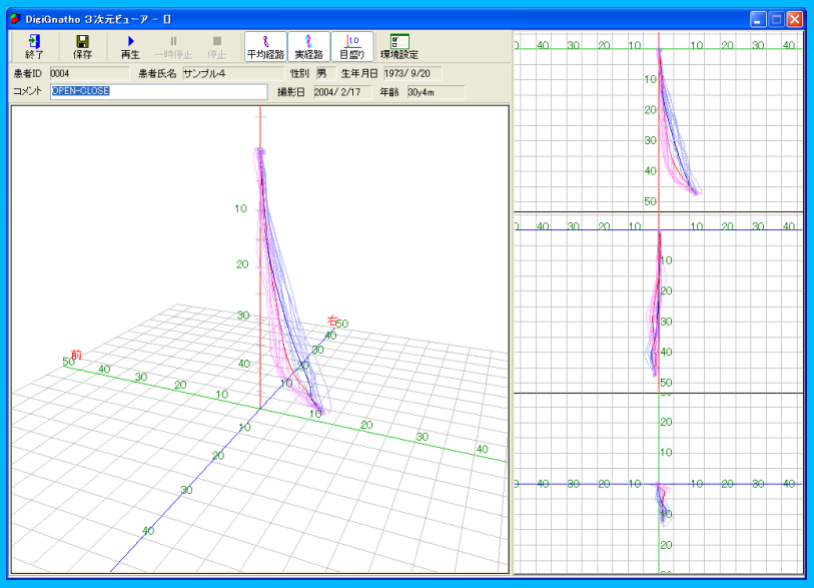
* “Combine 3D Data with Analysis Effective Data” allows 3D compositing only if the frontal and sagittal videos are taken simultaneously and the analysis starts together.
(If the shooting is not simultaneous or the analysis start frame is different, the display of 3D composition is not performed correctly.)

Check any frontal and sagittal planes and click [OK].

* When combining only the average cycle

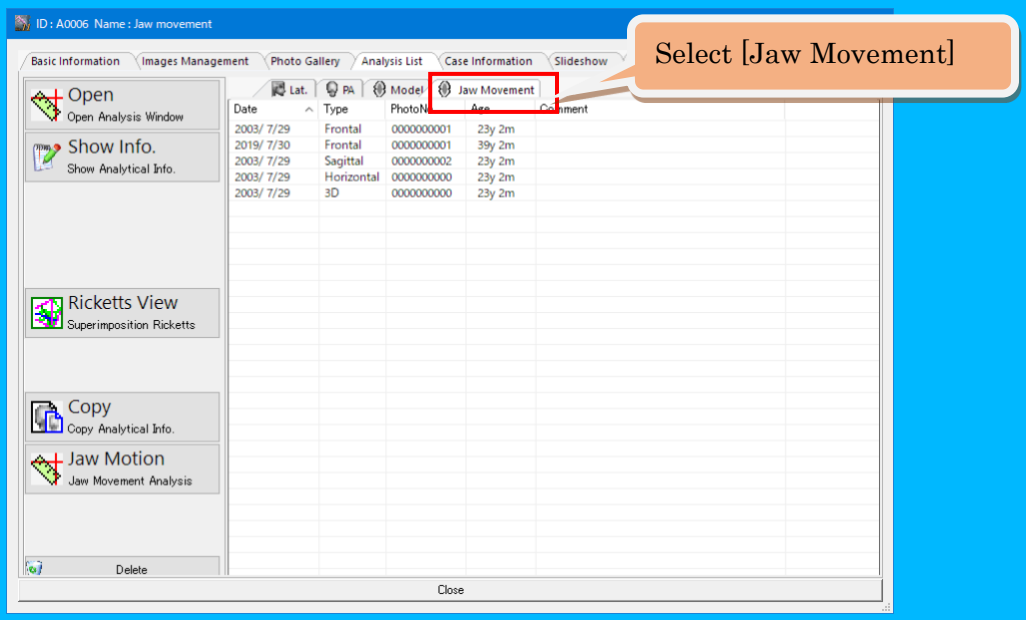


* In the case of 3D synthesis with analysis effective data



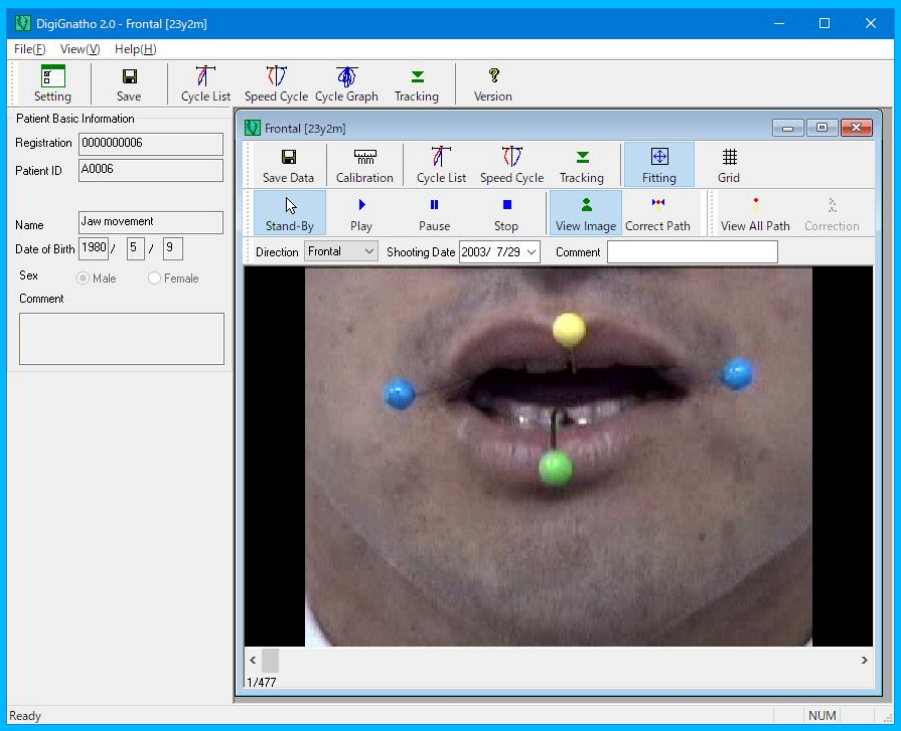
2. Refer to Patient Analysis Data

2-1. Refer to Analysis Data



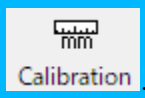
Select the data you want to refer from the analysis list.

(Click [Delete] to delete the selected data.)



…….**Save Data**

Saves the current data.
(marker setting, tracking setting, calibration, selection cycle, R rotation, L rotation, Mirror).

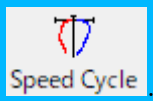


…….**Calibration**

Enter the length between two specified points in mm unit and correct the distance.

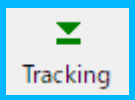
…….**Cycle List**

Display the dialog of Cycle List.



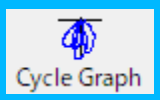
…….**Speed Cycle**

Display the dialog of Speed Cycle.



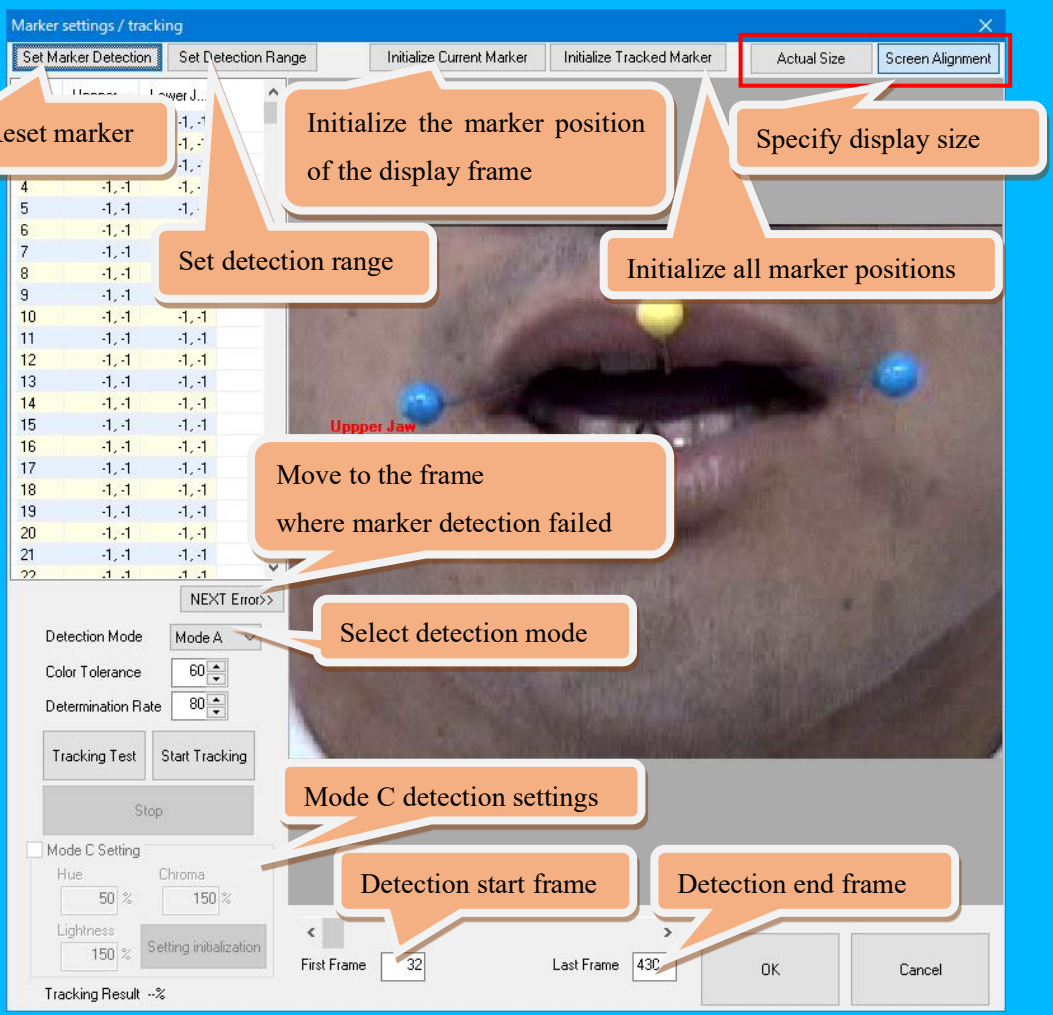
……. **Tracking**

Make settings for markers and tracking again.



……. Display the entire cycle.

Marker setting and Tracking setting



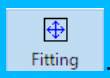
Tracking Test……. Tests whether the marker position of the displayed image can be detected.
The detected position is not retained.

Start Tracking……. Detects markers of all frames in the specified range.

Stop ……. Stop marker detection.

Detection Mode

Mode A … Normal mode
(Detected based on RGB values)
Mode B…Specified range detection mode
(Detected within the range specified by Set Deletion Range)
Mode C…Hue detection mode
(Detected based on the values of Hue, Chroma and Lightness)

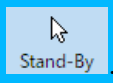


…….**Fitting**

Display according to the size of the window.

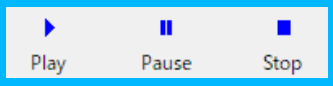
…….**Grid**

It becomes effective when the setting of calibration is completed.
Turn grids 1.0cm apart on and off.

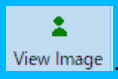


…….**Stand-By**

Return to image display from all cycle display.

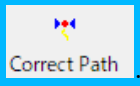


… Movie playback / pause / stop



…….**View Image**

Set the image display on / off.
The Correct Path is automatically turned off when the image display is turned on.

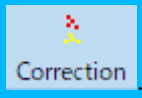


…….**Correct Path**

During movie playback, the upper jaw is drawn at a fixed marker position.
The image display is automatically turned off when the Correct Path is turned on.

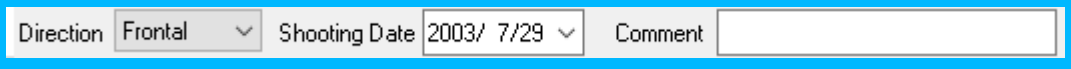
…….**View All Path**

Display all marker positions of each tracked frame.
When turned on, the image display is automatically turned off and Correct Path is turned on.
It will return to the image display on Stand-By.



……. **Correction**

When display all cycles, display the marker position with the upper jaw fixed.

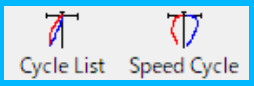


Direction ……. Select the shooting direction.

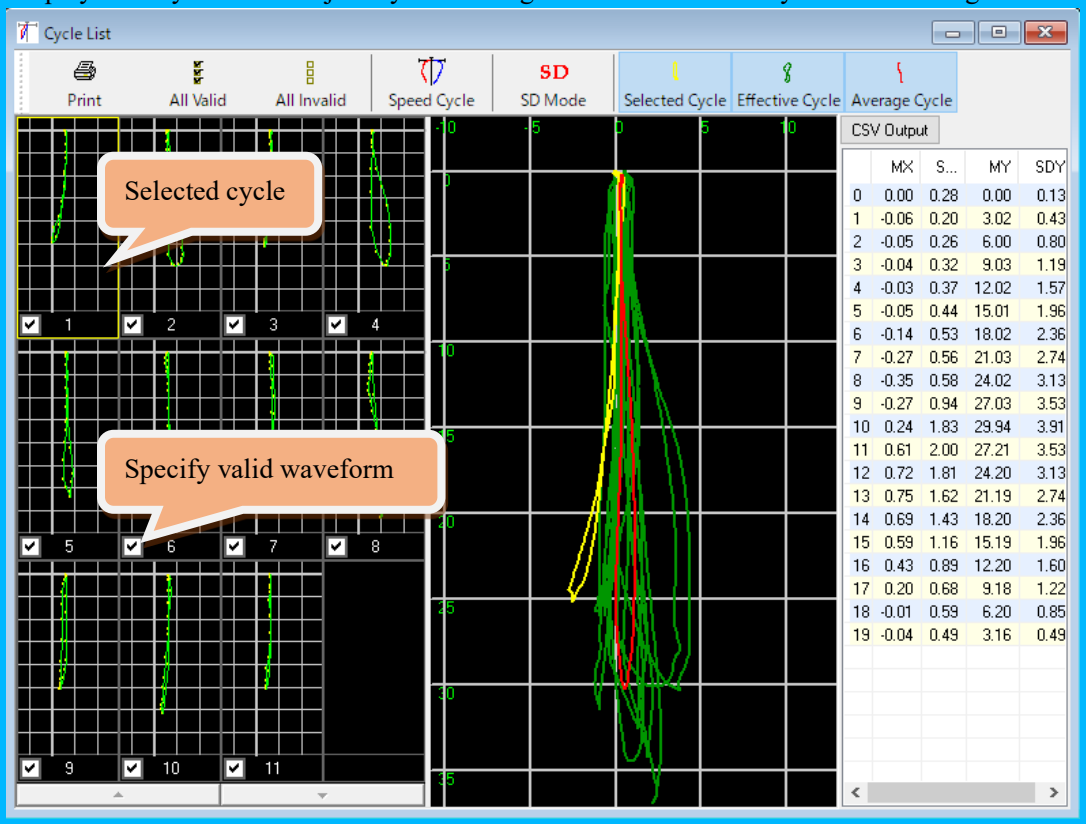
Shooting Date … Designation of shooting date

Comment ……Enter any comment

2-2. Select Cycle / Reference



Displays one cycle of the trajectory connecting the markers and the cycle of the average.



Selected Cycle……. The selection cycle is enclosed in yellow on the left screen.
The currently selected cycle is displayed in yellow on the screen on the right.

Effective Cycle……. What is checked on the left screen is the valid cycle.
The effective cycle is reflected in the average cycle.
The cycle being checked is displayed in green on the screen on the right.

Average Cycle……. .Average value of valid cycles checked.
This average cycle is reflected in "Compare Data".
It is displayed in red on the screen on the right.

SD Mode……Display in standard deviation mode.

All Valid…… Activate all cycles.

All Invalid……. Disable all cycles.

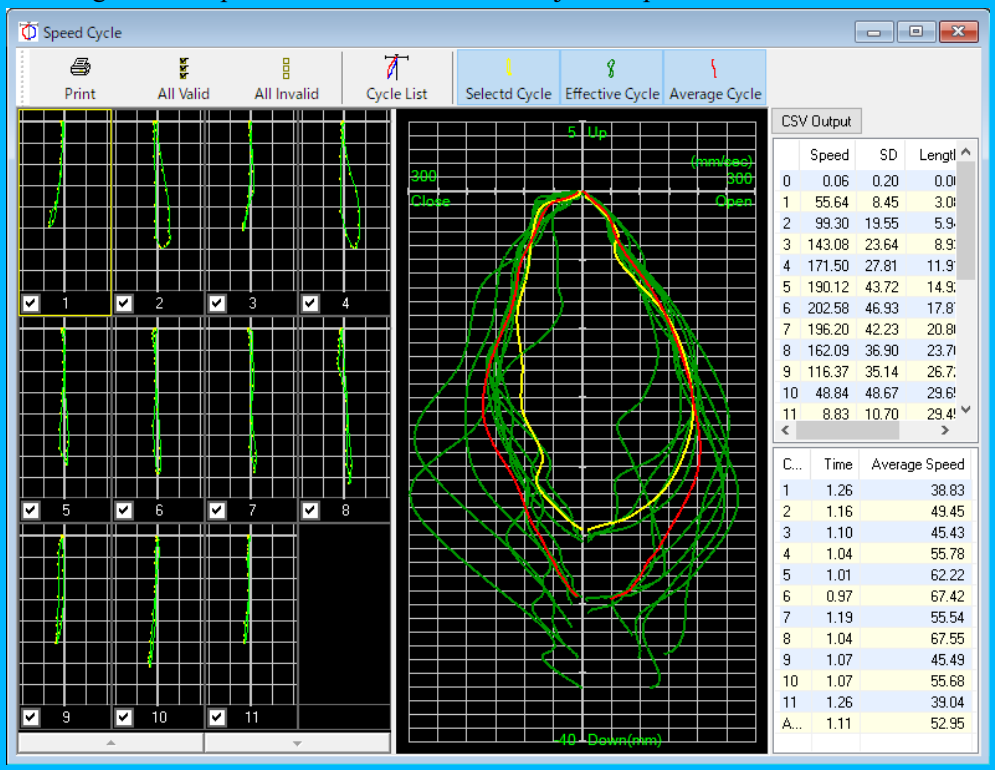
Speed Cycle……Display the speed cycle dialog.

Print……You can print the displayed data.
(Paper by default is set to the side of A4)

CSV Output……Outputs the numerical data of the table as a CSV file.
This data can be edited with spreadsheet software.

* The length can be measured by dragging the mouse on the center screen.

Speed cycle dialog.
It is a figure that represents the movement of the jaw in speed.

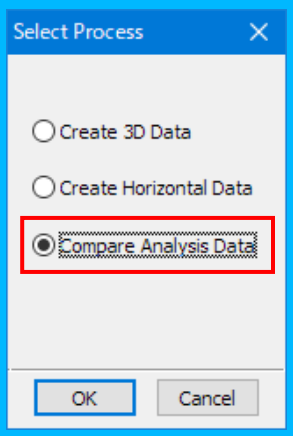


The content of each button is the same as [Cycle List].

Cycle List……. Display Cycle List dialog.

2-3. Compare Path

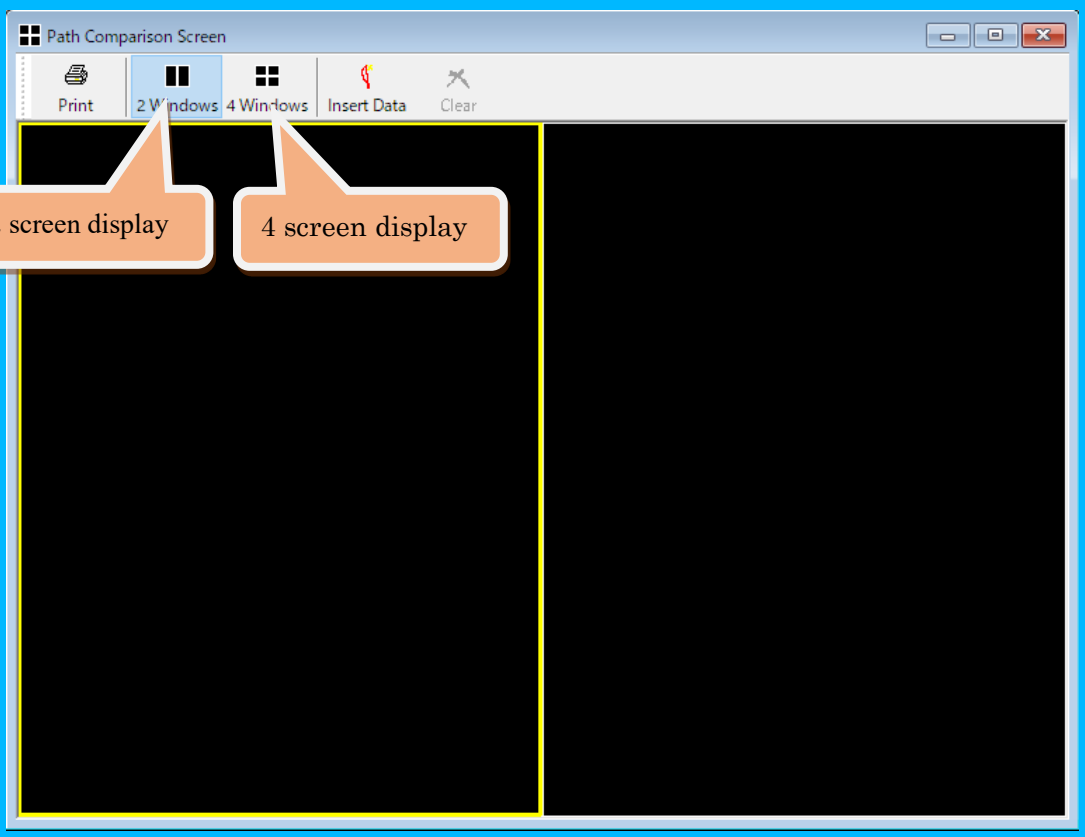
It is used when comparing with past analysis data.



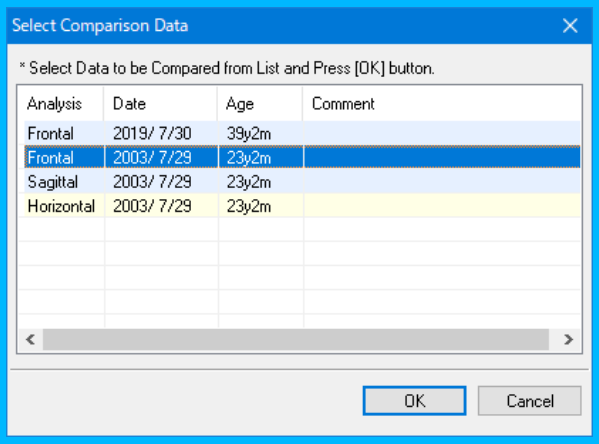
Click [Jaw Motion] from the analysis list,

Select [Compare Analysis Data], and click [OK].

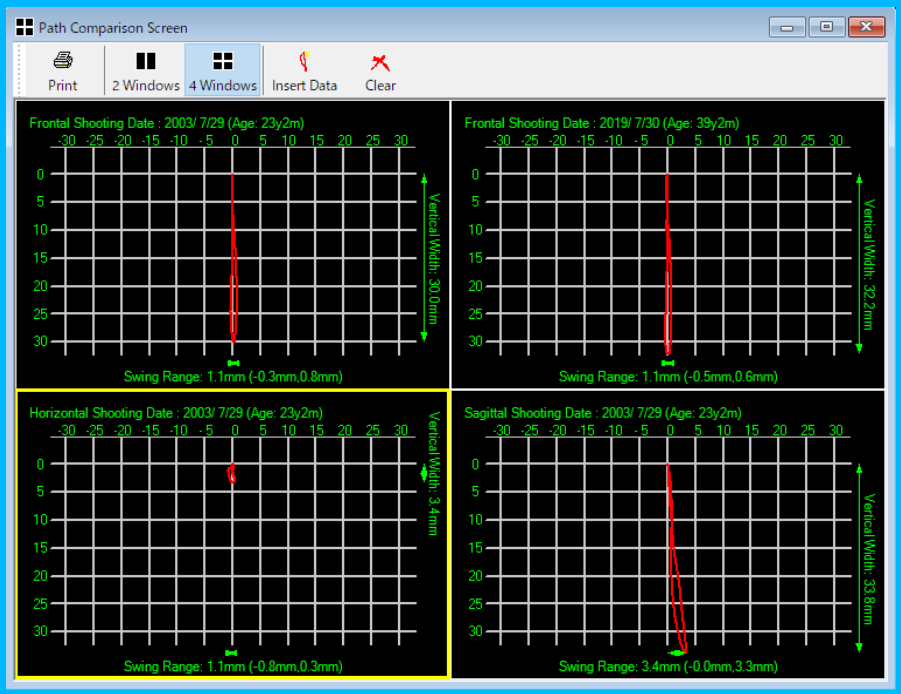
Display “Path Comparison Screen” dialog.



Select [2 Windows] or [4 Windows], select the screen you want to insert (the screen indicating that it is selected is highlighted in yellow), and click [Insert Data] or double-click the paste area. Select comparison data dialog is displayed.



Select the data to compare and click [OK].
Analysis data (average cycle) is displayed on the selected screen.



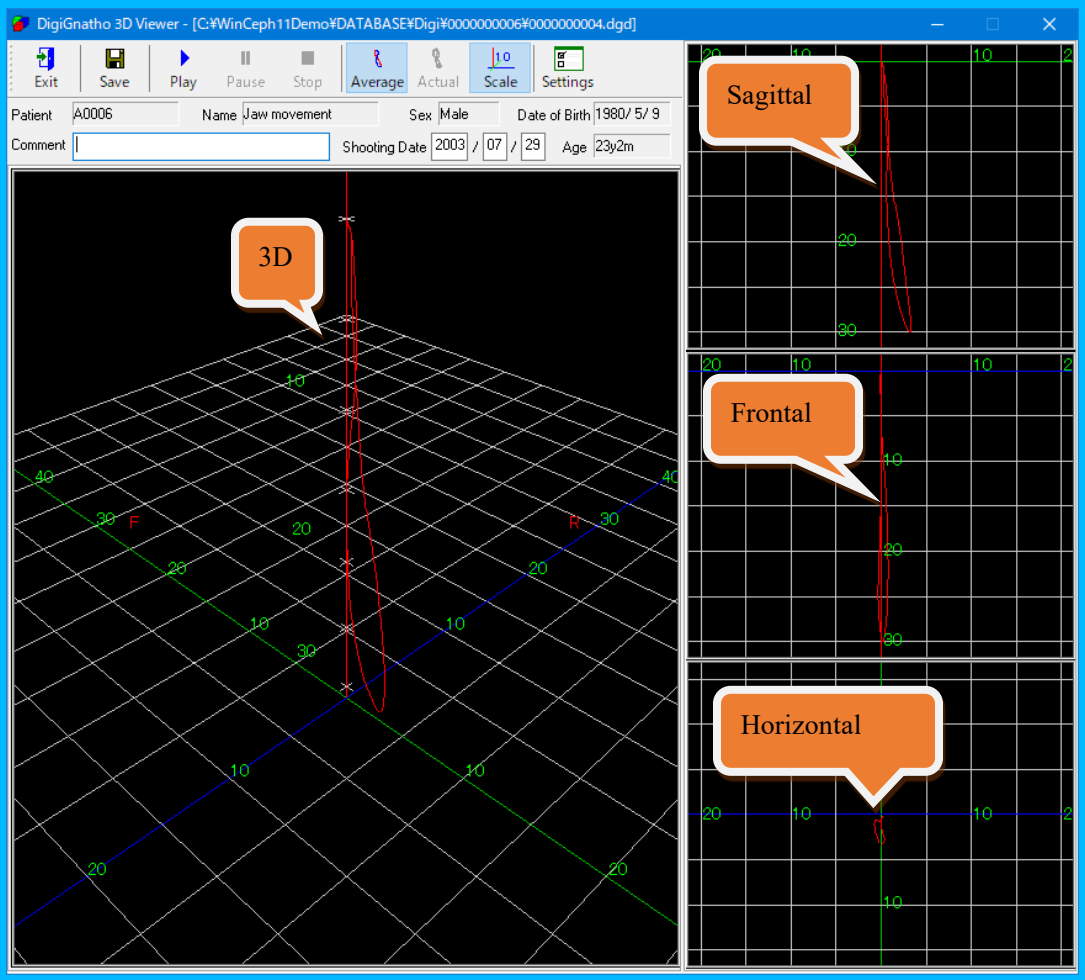
* Data not set for tracking and calibration is not displayed.

* Click [Clear] to clear the selected data.

Print……You can print the displayed data.
(Paper by default is set to the side of A4)

3. 3D Viewer

Explanation of 3D Viewer



(1)Tool bar

Exit……. Exit 3D viewer.

Save…….The saved data is displayed in the analysis list.

Play……. Play the marker movement with the synthesized data.

Average…Show / Hide of average cycle.

Actual…...Show / Hide of actual cycle.

Scale…….Show / Hide of numerical scale.

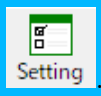
Settings…. Set the background color etc.

(2) 3D display unit

Jaw movement is displayed in 3D,
and you can change the viewpoint or direction by dragging the mouse.

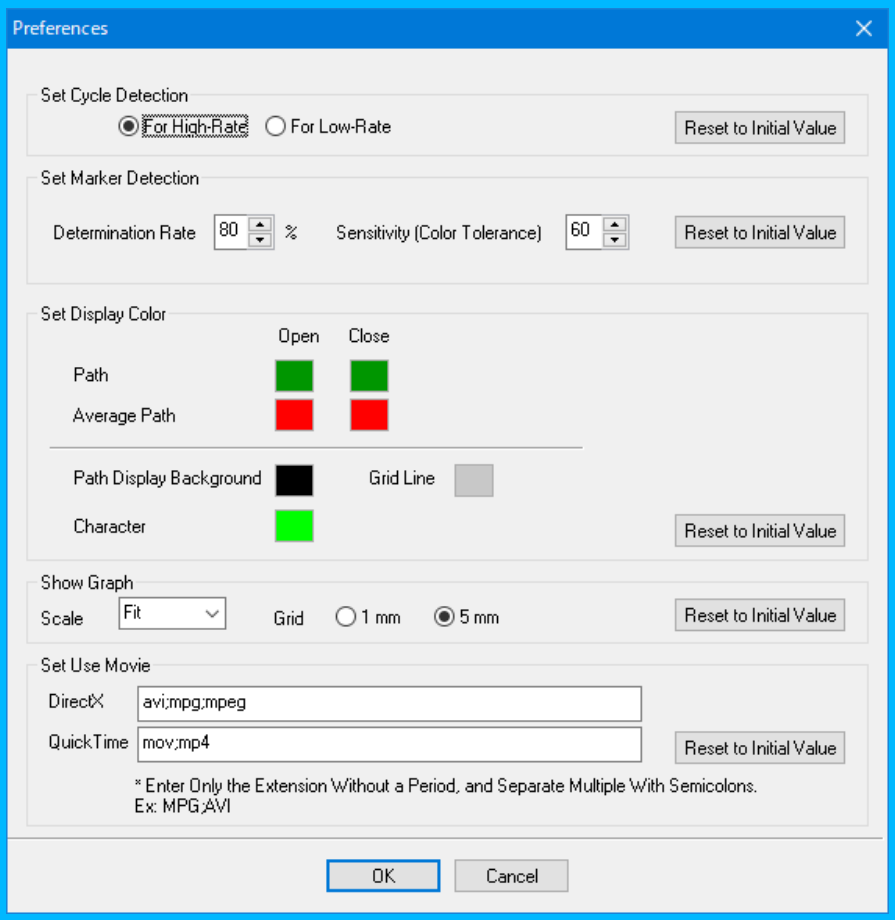
4. Tool bar and Menu bar

4-1. Tool bar



…….Setting

Click [Setting] to display the Preferences dialog.



Set Cycle Detection …Specify according to the video frame rate.
(High for more than 15 FPS, Low for less than 15 FPS)

Set Marker Detection

Determination Rate…Determination rate of marker detection
If the software does not recognize the marker, lower rate.

Sensitivity…….. Sensitivity (color tolerance)
If the software does not recognize the marker, raise it.

Set Display Color…You can change the display color of each item in "Cycle List" "Speed Cycle" "Path Comparison Screen".
Open is in the process of opening the mouth,
Close is in the process of closing the mouth.

Show Graph……. Select the grid unit to display in the graph.

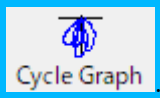
Set Use Movie……. Specify the type of movie shot with your digital camera etc.

……..Cycle List

Display the dialog of Cycle List

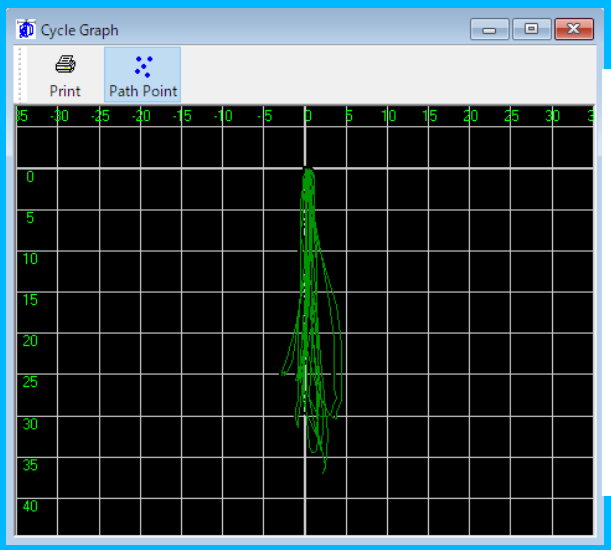
……Speed Cycle

Display the dialog of Speed Cycle



…….Cycle Graph

Display the marker position corrected for the upper jaw with the tracked data.



[Print]… Print the graph.

[Path Point]…

Show / Hide points (marker points)

……..**Version information**

Display the Version Information dialog.

4-2. Menu bar

a. File

Preferences…….Display the Preferences dialog.

Exit Analysis……...Exit DigiGnatho application.

b. View

Tool Bar……Set Show / Hide of the tool bar.

Status Bar…….Set Show / Hide of the status bar.

Display side by side at the bottom of the window.

c. Help

About DigiGnatho…. Displays the "About DigiGnatho" dialog.

* Attention:

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Developer **Rise Corporation**
〒983-0852
3-9-15, Tsutsujigaoka, Miyagino-ku, Sendai, Miyagi, Japan
Tel :+81-22-295-7321 Fax : +81-22-295-7328
URL : http://www.risecorp.co.jp/en/