Visual3D is updated many times a year and we always recommend staying up-to-date so that you have access to the latest features and bug fixes. These release notes provide a summary of changes for releases since the major v2022.08 release.

Major v2022.08 release

1. Multisubject support in C3D files using the subject prefix parameters (prefixes are provided by mocap systems).
    1. Single subject processing is unaffected by this feature, so prefixes are not necessary for that.
    2. Automatically adds subject prefix to marker labels landmarks and segments in Model Templates.
    3. Allows multiple subjects in the same movement trial to be processed (identified by the unique prefixes used).
    4. Allows multiple static calibration trials to be used for applying to movement trials. Handles each subject separately for computing means, normal data, metrics, etc. when working with the CMZ Library. Previously V3D required 1 subject per CMO/CMZ file.
    5. Allows subject tagging in the model to allow setting the active subject tag (in Set_Active_File) which lets pipelines process different types of subjects differently (ie; BATTER, PITCHER, etc. tags, generically applied to any specific subject prefix).
    6. Nearly every pipeline command modified to support active subjects and processing subjects separately.
2. Additional support for markerless data, including model building and processing for Theia3D markerless files.
3. Bug fixes and performance tweaks throughout.
4. RT Plugin updates for compatibility with manufacturer software updates
5. Numerous usability and UI enhancements throughout.

For an in-depth discussion on how Visual3D provides Multisubject support for C3D files with subject prefixes, go here.

Recent Updates

1. Updates for 2024.06.1
    1. [Feature] Added a new model based item for JOINT_QUATERNION.
    2. [Enhancement] Added an option to specify an Event_Sequence for drawing target/landmark trails in the 3D viewer
    3. [Bug Fix] The user specified color of force platforms was not used when the user selected a custom background colour
    4. [Bug Fix] Evaluate_Expression function Gravity_Vector did not return a value
2. Updates for 2024.05.3
    1. [Enhancement] Added a new reserved character for the space character in file and signal names related to Qualisys PAF applications.
3. Updates for 2024.05.2
    1. [Bug Fix] Modified naming convention related to Qualisys PAF applications.
4. Updates for 2024.05.1
    1. [Enhancement] Added the ability to define the scale, position, and size of the floor in the 3D viewer. This allows viewers to define a ground that is sloped (i.e. a pitching mound). The transformation is stored in the cmz file allowing individual cmz files to have unique

"floors"
2. [Enhancement] Extended the implementation of a shadow segment. For Theia and XSens data, shadow segments are added automatically to the model for the thorax and feet
3. [Enhancement] Extended the implementation of the automatic model for XSens mvnx files. No longer is the model implicitly defined in VIsual3D. 4×4 Rotation matrices are created automatically from the mvnx file, allowing the user the ability to modify individual segments in the model, and to more easily adapt segments.
4. [Enhancement] Added more functionality to the Manage_Theia3D_Merge command that permits intermediate pipelines in the process
5. [Bug Fix] Fixed several minor issues related to multiple subjects/multiple models in a workspace
6. [Bug Fix] Many small bug fixes

5. Updates for 2024.03.3
    1. [Bug Fix] Fixed a problem where a shadow segment would not work properly when part of an IK chain.
    2. [Bug Fix] Fixed an issue where the reference object for a shadow segment was not being set correctly.
6. Updates for 2024.03.2
    1. [Bug Fix] Fixed a problem with legacy pipeline command parameters for the Manage_Theia3D_Merge pipeline command.
    2. [Bug Fix] Fixed atan2 expression to ensure that it sets the derived signal's data rate.
    3. [Bug Fix] In calculating functional joints, added a guard against the case where a Target has more frames than the C3D parameters specified.
7. Updates in 2024.03.1
    1. [Enhancement] Added ways for the user to specify their file structure when using the Manage_Theia3D_Merge pipeline command.
8. Updates in v2024.02.2
    1. [Bug Fix] Fixed a backwards compatibility issue for the Manage_Theia3D_Merge pipeline command's parameters.
9. Updates in v2024.02.1
    1. [Enhancement] Added support for Theia3D versions that export Theia Model 10 or higher
    2. [Bug Fix] Modified FP_Auto_Baseline for an unusually light subject
    3. [Enhancement] Modified Shadow Segment functionality
10. Updates in v2023.12.1
    1. [Bug Fix] Fix FP_Auto_Baseline for unusual customer force platform and subject weight which used incorrect representative zero frame
    2. [Bug Fix] Fix query using the CMZ/CMO Library
    3. [Bug Fix] Fix C3D file read for old NDI files
    4. [Enhancement] Support other signals in Real-Time for Compute_Planar_Angle
    5. [Bug Fix] Fix Real-Time image switching when streaming a short C3D File.
11. Updates in v2023.11.2
    1. [Bug Fix] Fix regression in subject metrics which can cause the first 5 metrics read from .cmz file to not be calculated properly.
12. Updates in v2023.11.1
    1. [Enhancement] Performance improvements in computing pose and landmarks
    2. [Enhancmment] Add new segment type Shadow Segment which shadows another segment
    3. [Enhancement] Add expression function to convert data To_String(…)
    4. [Bug Fix] Report Subject item overlapped diagnosis on the wrong line
    5. [Bug Fix] Metric_Signal_Value_At_Event incorrectly did not process the instance

parameter
6. [Bug Fix] Fix numeric string identification which incorrectly identified certain strings as numeric

13. Updates in v2023.10.2
    1. [Usability] Prompt user if they are creating a segment for ALL_SUBJECTS when there is more than one subject to ensure they intended to do that.
    2. [Bug Fix] Fix for memory issue occasionally on start of Visual3D.
    3. [Bug Fix] Fix graphing mean and stddev when graphing subjects.
    4. [Bug Fix] Fix out of order secondary model building in certain curcumstances.
    5. [Bug Fix] Fix for crash reading library (.cmx) files when .cmz files are very large. Requires re-indexing library if you have problems crashing because .cmz files are too large. This should be a rare problem browsing the library.
    6. [Bug Fix] Additional fix for Spline function when the entire signal being used for Spline is No_Data.
    7. [Bug Fix] Allow Temporal Distance metrics when there are no models assigned to the motion file, but events are present.
    8. [Bug Fix] Fix numeric check which allowed 2023.10.2 to be incorrectly interpreted as numeric instead of string.
14. Updates in v2023.10.1
    1. [Bug Fix] Fix Spline function in expressions that caused incorrect No_Data data point at the end of the signal. Also fix Spline when signal contains No_Data in the middle of the signal.
    2. [Bug Fix] Fix commands using 'Left' and 'Right' to be calculated such as in Metric_Signal_Stats.
    3. [Enhancement] Speed up editing large scripts that were very slow in the pipeline editor.
    4. [Bug Fix] Fix Graphing where lines were not being set to bold.
15. Updates in v2023.09.3
    1. [Bug Fix] Revert code included in expression memory blow up fix which was incorrectly constructed and not part of the actual memory issue fixed in 2023.07.1
16. Updates in v2023.09.2
    1. [Bug Fix] Fix commands needing signal components
    2. [Bug Fix] Export to Ascii fix for empty strings
    3. [Enhancement] Compute Link Model Based dialog tweak
17. Updates in v2023.09.1
    1. [Bug Fix] Revert Export to Ascii signal ordering for consistency of columns with previous releases.
    2. [Bug Fix] Minor fix in FP Auto Baseline which is a very insignificant change in baseline result.
    3. [Bug Fix] Fix commands needing signal components - errors stemming from getting signal parameters internally.
18. Updates in v2023.08.6
    1. [Bug Fix] Reports Lines would not show up in bold in the viewer, but would when printing.
    2. [Bug Fix] Fixed a few bugs related to ExportToAscii, adding muscles, and several other minor fixes.
19. Updates in v2023.08.5
    1. [Bug Fix] Fix parsing parameters in command Metric_To_Fit_Signal_To_Line
    2. [Bug Fix] Fix bug reading VRML file
20. Updates in v2023.08.4
    1. [Feature] Add option for Export_To_Matfile, Export_Polygon_C3D_File to allow creation of output folder.
    2. [Bug Fix] Fix parameter parsing of signals for Set_Data_To_New_Value and

Command_Metric_Trajectory_Ellipse

21. Updates in v2023.08.3
    1. [Bug Fix] Fix parsing of resulting metric folder when PROCESSED is not used.
22. Updates in v2023.08.2
    1. [Bug Fix] Fix crash caused by parsing error looping
23. Updates in v2023.08.1
    1. [Bug Fix] Fix crash and processing error in command Metric_Signal_Value_At_Event
24. Updates in v2023.07.2
    1. [Bug Fix] Fix Real-Time sounds for sound files, as well as yellow/red warning graphs for 2D graphs
25. Updates in v2023.07.1
    1. [Enhancement] Add exclude event handling to Temporal and Distance calculations
    2. [Enhancement] Add ability to graph only X, Y and Z for target data
    3. [Enhancement] Add ability to create folder when using File_Save_As
    4. [Bug Fix] Fix subject processing for special cases of tagging different subjects differently across files.
    5. [Bug Fix] Fix a minor bug with DFT power.
    6. [Bug Fix] Fix bug with a network file open of an empty file
    7. [Bug Fix] Fix expression handling which could cause stack memory to be exceeded.
    8. [Bug Fix] Fix ambiguity referencing Gravity in expressions which could become ambiguous with Gravity from the model
    9. [Bug Fix] Fix crash editing non-2D Graph report items when an Interactive Graph exists.
26. Updates in v2023.06.7
    1. [Bug Fix] Fix regression in commands by reinitialization of commands between calls. Subsequent calls were being seeded with the signals from previous calls which is incorrect behavior.
    2. [Bug Fix] Fix empty Kinatrax file that was causing a crash.
    3. [Bug Fix] Fix a rare circumstance causing IK to fail.
27. Updates in v2023.06.6
    1. [Bug Fix] Fix expression for PI() function which was inadvertently broken in 2023.06.3
    2. [Bug Fix] Fix for expression which caused a stack overflow
    3. [Bug Fix] Allow component to be specified on Model::Landmark expression
    4. [Feature] Additional Emg_Time_Domain processing changes
28. Updates in v2023.06.3
    1. [Feature] Add Command for Emg_Time_Domain
    2. [Bug Fix] Prevent crash with duplicate rotation signals
    3. [Bug Fix] Prevent editing of LAB segment
    4. [Bug Fix] Fix regression to allow component on Model Landmarks in expressions
29. Updates in v2023.06.2
    1. [Bug Fix] Fix graphing of certain signals that have a lot of frames that caused the drawing of lines to appear to go above or below the bounds of the graph.
    2. [Bug Fix] Fix selection of tracking targets in the pelvis edit, file tag and subject tag dialogs.
    3. [Bug Fix] Continued pipeline/command parsing changes
30. Updates in v2023.06.1
    1. Internal Only Release, test and document new command
31. Updates in v2023.05.4
    1. [Bug Fix] More fixes for Meta Command parsing regression in 2023.05.1
32. Updates in v2023.05.3

    1. [Bug Fix] More fixes for Meta Command parsing regression in 2023.05.1
33. Updates in v2023.05.2
    1. [Bug Fix] Fix for Meta Command parsing regression in the last version.
34. Updates in v2023.05.1
    1. [Enhancement] Add Version() function to Evaluate_Expression
    2. [Enhancement] Add second synchronized video play back window
    3. [Enhancement] Add expression for Metric_Cyclogram_Perimeter and Metric_Cyclogram_Area
    4. [Bug Fix] Fix regression in assign model to motion file dialog
    5. [Bug Fix] Fix regression for Search/Replace tag didn't update graphs properly
    6. [Bug Fix] Fix regression resulting in same signal used inside an expression
    7. [Bug Fix] First Derivative didn't report error when not calculated
    8. [Bug Fix] Fix export of Temporal Distance Report item
35. Updates in v2023.04.3
    1. [Bug Fix] Fix bug introduced in report annotations
    2. [Enhancement] Modified spacing in processing results
36. Updates in v2023.04.2
    1. [Enhancement] Add compute margin of stability function to Evaluate_Expression
    2. [Bug Fix] Change new parameter added to File_Open for Folder to File_Path since use of the parameter Folder is common and its use here can break subsequent pipeline commands.
37. Updates in v2023.04.1
    1. [Enhancment] Evaluate_Expression add matrix operations
    2. [Enhancement] File save without histories
    3. [Enhancement] Add Event Sequence to export multiple C3D files for Export_Polygon_C3DFile command
    4. [Enhancement] Add StdDev shade style to the Make_A_Line_Graph command.
    5. [Bug Fix] Temporal Distance Report Item vertical chart fix
    6. [Bug Fix] Fix crash in rare circumstances on recalc
    7. [Bug Fix] Show kinematic only segments for link_model_based items where they were missing.
    8. [Bug Fix] Fix broken export to ascii of Origin and Rotation
    9. [Enhancment] Add export to matfile of Origin and Rotation
    10. [Bug Fix] Fix FP_Auto_Baseline reduced minimum which became broken
    11. [Bug Fix] Fix report annotations bug
    12. [Bug Fix] Fix clean up of model data in motion file when it is unassigned from a model
38. Updates in v2023.03.1
    1. [Infrastructure] Upgraded to new compilers
    2. [New Feature] Allow saving cmz with histories removed
    3. [Enhancement] Markerless systems support changes
    4. [Bug Fix] Fix crash when certain commands are run before a recalc
    5. [Bug Fix] Fix report template reordering when search/replace is done on a report page
39. Updates in v2023.02.3
    1. [Bug Fix] Fix P2D mouseover bug which prevented other lines from appearing in mouseover text
    2. [Bug Fix] Signal component not updated internally when changing file tag
    3. [Bug Fix] Report fix when deleting all pages of the report
    4. [Bug Fix] Report fix for selecting item in the report tree
    5. [Enhancement] Update IK constraints to use 2 chains (speed)
    6. [Enhancement] Markerless model update on file open
40. Updates in v2023.02.2

1. [Bug Fix] Fix logic in breakpoint command when called nested down Meta-Commands.
2. [Bug Fix] Fix error in Metric Mean which should be just a warning, as well as a crash found when testing.
3. [Bug Fix] Handling of rotations when data is missing, as well as support for new generic model.

41. Updates in v2023.02.1
    1. [Bug Fix] Fix signal parameter optimization to match usage in commands
    2. [Bug Fix] Some event commands were not making use of subject prefixes
    3. [Bug Fix] Stop showing assign model to motion file dialog when there is only one primary model
    4. [Feature] Hidden parameters added to improve efficiency of certain model building commands.
    5. [Feature] More support changes for markerless data
42. Updates in v2023.01.4
    1. [Performance] Removed debug code which slowed down performance
    2. [Usability] Hide warning when it is not needed
    3. [Bug Fix] Make signal parameters consistent with command use.
43. Updates in v2023.01.3
    1. [Enhancement] Use of subject prefix along with Kinetic_Kinematic data in report graphs
    2. [Enhancement] Additional enhancements to markerless processing
    3. [Bug Fix] VIK file not saved for NO_SUBJECT.
44. Updates in v2023.01.2
    1. [Performance] Made several changes to dramatically improve performance with many secondary models and a lot of segments
    2. [Enhancement] Add ability to highlight target range in real-time speedometer graphs
    3. [Bug Fix] Fix bug with multiple subjects not animating properly
    4. [Bug Fix] Double click to add event to analog signals was broken (added at wrong frame).
    5. [Bug Fix] Fix huge .cmz file size in customer file
    6. [Bug Fix] Expression evaluation of secondary model items
    7. [Bug Fix] Landmark item loses value when duplicated in secondary models
    8. [Bug Fix] Fix crash with buffer overflow
45. Updates in v2023.01.1
    1. [Enhancement] Additional markerless systems updates and support
    2. [Enhancement] Import_Signals_From_C3D_File support for IMPORT_ANALOG_SYNCH parameter
    3. [Bug Fix] Fix for report graphs drawing mean to not be case sensitive
    4. [Bug Fix] Fix crash when creating a metric
    5. [Bug Fix] Move folder path up in list of export parameters
    6. [Bug Fix] Fix Update_Force_Corners crash
    7. [Usability] Fix eroneous segment being highlighted in certain circumstances when using multiple models
    8. [Usability] Modify command parameter name from Subject_Name to Subject_Prefix to represent parameter use.
46. Updates in v2022.12.2
    1. [Bug Fix] Graph edit PROCESSED folder not recognized
    2. [Bug Fix] No models returned when ALL_MODELS selected
    3. [Enhancement] Additional markerless systems support changes
47. Updates in v2022.12.1
    1. [Bug Fix] Metric Root Mean Squared fix for if one component of the result is NO DATA

(NAN)
    2. [Enhancement] Realtime graphing features, circular graphs
    3. [Enhancement] Additional Theia file support changes
48. Updates in v2022.11.3
    1. [Bug Fix] Fix global setting which prevented multiple models from being assigned to multiple motion files.
    2. [Enhancement] Additional Theia3D processing changes.
49. Updates in v2022.11.2
    1. [Bug Fix] Fix crash adding or editing a text/metric table
50. Updates in v2022.11.1
    1. [Bug Fix] Fix crash performing quality assurance analysis
    2. [Bug Fix] Fix error message for automatic gait events when not performing TPR.
    3. [Enhancement] Minor tweak to graph title alignment
    4. [Enhancement] Additional Theia3D processing changes.
    5. [Usability] Fix real-time dialog showing multiple copies of the same metric / signal
    6. [Usability] Show landmark definition items even when the items don't exist in the current static trial.
51. Updates in v2022.10.2
    1. [Bug Fix] Fix regression from performance change released in v2022.10.1
52. Updates in v2022.10.1
    1. [Enhancement] Real-time speedometer graph changes and 3D viewer support
    2. [Enhancement] Allow alignment for graph titles to align top, center or bottom in area above graph.
    3. [Enhancement] Allow mouseover of graphs that are not time or frame based.
    4. [Enhancement] Additional Theia3D processing changes.
    5. [Performance] Report pages with 2D Stagger graph were very slow to draw, improve to be same speed as other 2D graphs
    6. [Bug Fix] Center of Mass with multiple static trials assigned to motion file wasn't using additional models
    7. [Bug Fix] Add_Landmark_From_Event fix
53. Updates in v2022.09.1
    1. [Bug Fix] Fix landmarks between 2 markers at same location
    2. [Bug Fix] Fix Set_Active_File behavior
    3. [Enhancement] Theia3D file processing changes
54. Updates in v2022.08.5
    1. [Enhancment] Add Metric_Mean to real-time pipeline
    2. [Enhancement] Theia3D file processing changes
55. Updates in v2022.08.4
    1. [Enhancement] New speedometer graph in real-time biofeedback
    2. [Enhancement] Theia3D file processing changes
56. Updates in v2022.08.3
    1. [Bug Fix] Temporal Distance report item was not using file tags (regression)
    2. [Bug Fix] Real-Time Temporal Distance regression using subjects
    3. [Bug Fix] Model metrics display not being updated when commands change metrics while window is open
    4. [Bug Fix] Fix regression in File_Close command using new parameter
    5. [Enhancement] Theia3D processing changes
57. Update v2022.08.2
    1. Update missing .dll

Previous Updates

Functional Changes

Visual3D v6 - older updates

Visual3D v6 contains more changes than any other Visual3D release. The new file format (CMZ) saves link-model data so large files will open much faster, allows for model animation while viewing the library, and allows for model based access for calculations across the library of .cmz files. With the new 64 bit version of Visual3D along with multithreading, processing time will be significantly reduced.

NOTE: plug-in modules, real-time, and MatLab support are different in 32 and 64 bit versions. There are separate plugins for 32 and 64 bit versions of Visual3D, you must download the correct plugins for the version you install. The 64-bit version will allow for better use of memory, and supports some later features of MatLab. Some older plugins have not been ported to 64 bit, so if you do not find a plugin you were previously using on 64 bit, download and install the 32 bit version to use the older plugin.

Although there have been many enhancements to Visual3D, below is an outline of just a few of the new features and new commands.

Visual3D is continuously updated with new features and enhancements so keeping up with the latest download you will be sure to have access to the latest bug fixes, new features and enhancements.

===== Performance Changes =====

- A 64 Bit version of Visual3D

- This will resolve issues for users with large CMO's that often hit the "Out of Memory" error
- New CMZ file format for saving files

- Faster file open times
- Performance enhancements for faster model building and IK computations times
- Multithreading
- Library Enhancements:

- Segment animation
- Ability to create new Link Model Based items
- Incorporate CalTester+ force platform corner location into Visual3D
- Inverse Kinematics Enhancements:

- Motion Constraints
- Boundary Conditions
- C3D files are processed simultaneously for much faster processing times

===== Interface Changes =====

- Easier report editing with tabbed design. More changes currently in the works for future releases
- Support for 4K monitors
- Many real time streaming enhancements and features for RT biofeedback
- Enhanced graphs with many improvements such as smoother lines and better scaling
- New interface enhancements and toolbar icons

- Will also fix print to PDF issues for some users when printing dotted lines
- Modeless dialog capability for using common dialogs while working in other dialogs simultaneously
- Event Sequence definitions to simplify specifying and modification of ranges throughout Visual3D
- Color coded text editor for the pipeline
- The Query function was added to the Reports
- Copy Landmark feature

===== Event Creation =====

New/Modified Commands (click to expand)

Event_Define_Event_Sequence - Event Sequences can be used to define sequences of events such as right stance, or the first 20 cycles. Event sequences can then be used in place of events in subsequent processing.

When defining maximums & minimums in Visual3D, a new parameter was added which allows users to define the threshold. This parameter was added for the following commands:

* Event_Global_Maximum
* Event_Global_Minimum
* Event_Maximum
* Event_Minimum

===== Event Management =====

New/Modified Commands (click to expand)

Event_Sequence_Delete - Event Sequences can be used to define sequences of events such as right stance, or the first 20 cycles. Event sequences can then be used in place of events in subsequent processing.

===== File Management =====

New/Modified Commands (click to expand)

Create_Text_Data - Text Data is a new "Signal Type" which was added to the data tree. This allows users to define strings in the CMO file. For example, a signal can be created called "Affected_Side" and the user can specify the Left or Right side here. Files can be queried using text data as well.

===== Force =====

New/Modified Commands (click to expand)

FP_Auto_Baseline - This command can be used to automatically determines the zero period and the force platform minimum value. This is especially helpful for treadmill trials when it is difficult to determine a period when the treadmill is unloaded and for front to back treadmills where a high force platform minimum value can cause discontinuity in the force signal.

Locate_Force_Platform_Corners

Modify_One_Force_Platform

Reset_Segment_Assignment_To_Force_And_COP

===== Matlab =====

64 bit Matlab support.

- Put_To_Matlab
- Get_From_Matlab
- Eval_In_Matlab

Certain Matlab commands are only available in the 64 bit version. Matlab no longer supports 32 bit installations, so legacy support will only be available in the 32 bit version of Visual3D.

===== Metric =====

New/Modified Commands (click to expand)

When defining maximums & minimums in Visual3D, a new parameter was added which allows users to define the threshold. This parameter was added for the following commands:

* Metric_Maximum
* Metric_Minimum
* Metric_Time_of_Maximum_from_Event
* Metric_Time_of_Minimum_from_Event
* Metric_Time_of_Global_Maximum_from_Event
* Metric_Time_of_Global_Minimum_from_Event

Metric_Compute_Confidence_Ellipse

===== Model Based Data Computation =====

New/Modified Commands (click to expand)

Compute_Model_Based_Data parameters with added treadmill velocities

===== Pipeline Control =====

New/Modified Commands (click to expand)

Get_Pipeline_Parameter_Index_Value

Conditional_Statement
Conditional_Statement_End

===== RT and Post Processing Biofeedback =====

New/Modified Commands (click to expand)

Animated_Line

Animated_Sphere

Animated_Surface

Animated_PolyLine

Modify_RTGraph_Settings

===== Reports/Interactive Graphs =====

New/Modified Commands (click to expand)

Modify_All_Graphs

Overlay_Report

===== Folder Encryption =====

New/Modified Commands (click to expand)

Add_Password_Protection_To_Folder

Remove_Password_Protection_From_Folder

Enter_Password_To_View_Folder_Data

===== Other =====

New/Modified Commands (click to expand)

Open_Edit_Dialogs

Map_Segment_Color_To_Signal_Value