This tutorial covers the basic processing steps starting from C3D files through to report generation. None of these steps will be described in detail, but we will provide links to pages with more detailed descriptions.

As a starting point, we will assume that you have:

- a model template (MDH)
- a signal processing pipeline (V3S)
- a report template (RGT)
- a static trial (C3D)
- multiple movement trials (C3D)

If you don't have these templates or pipelines, you can download the sample files or follow the links to documentation on how to create them.

You can download sample C3D files to use with this tutorial **here**.

Creating a model

To create the model, make sure that Visual3D is started by selecting ** Start → Programs → C-Motion → Visual3D**

1. Load the static C3D file by going to **Model → Create (Add Static Calibration File) → Hybrid Model from C3D file**. **Note:** Your screen may look slightly different.
2. Select “LowerBodyStaticTrial01.c3d.” Click **Open**.

Applying a model template

In this section, you will apply a previously constructed model template. If you don't have a **model template** (.mdh file) for this standing trial, please complete the Model Building Tutorial which describes the process for building a model and creating a template.

If you have a model template, then:

Visual3D will switch to Model Building mode automatically. The 3D viewer will display the average value of the marker locations from the standing file. The dialog bar to the left of the screen will contain a list of segments, which by default will contain only a segment representing the Laboratory (e.g. Motion Capture Volume).

1. **Apply the model template:**
    1. Go to Model → Apply Model Template
    2. In the dialog, select the model template
2. **Set the subject height/weight:**
    1. In the models tab, go to Subject Data/Metrics
    2. Double click on the value next to Mass listed under Expression
    3. Double click on the value next to Height listed under Expression

Using a Pipeline Command

Pipeline commands can be used to apply the model template and set the subject height/weight. These commands can be edited to look for specific files, or if parameters are left blank, they will prompt the user for relevant information.

1. Apply Model Template command
2. Set Subject Height command
3. Set Subject Weight command

A great example of applying a model template can be found on the following pages Pipeline Processing Example 1 and Pipeline Processing Example 2.

Opening movement files

This section will open/add the movement files to the model that was created in the previous sections on this page.

If you were able to successfully load the static trial and apply the model template by following the steps above, the static trial should appear in the Workspace tab.

This means you are ready to continue onto the next step.

1. **Load the dynamic trials**

a. File → Open/Add…

b. Select **Insert new files into your currently open workspace**

c. Select “WalkingTrial_01.c3d”

Verify - Verify the model file named WalkingTrial_01.c3d appears in the column labeled **Motion Files**. Visual3D displays the active file in the Motion Files column, but not directly beside the static trial file.

Verify - Click on the Signal and Event Processing Tab. The viewing area will open. At this point, the movement trial has not been associated (or mapped) to the model trial. In the viewing area, only the markers will be animated.

Note: If no image appears, verify that there is a single active file in the file name box.

To activate the animation, click on the arrowhead PLAY button at the bottom of the screen. The marker figure should walk across the screen. However, no bones will appear.

Using a Pipeline Command

The dynamic trials can be opened using the File_Open command.

A great example of assigning models to motion files can be found on the following pages File Open.

Assigning movement files to a model

In the previous sections, the movement files were added and the model template was applied to the static standing trial. These movement files need to be associated or assigned with static standing model file. When movement files are assigned to a model, the pose (position and orientation) of each segment and landmarks in the model are computed for the motion file. To assign the movement files to a model, follow these steps:

1. **Assign model to motion trial**

a. Model → Assign Model to Motion Files

b. Select the checkbox next to WalkingTrial_01.c3d

c. Click OK

Verify - The 3D Animation Viewer should now display a skeleton of the lower body that has been associated with your movement data. You can animate the skeleton by clicking the PLAY button in the VCR controls at the bottom of your screen.

Pipeline command for assigning a model

The model can be assigned to the movement trials using the Assign_Model_File command.

A great example of assigning models to motion files can be found on the following page Assign_Model_File.

Basic Signal Processing

Signal Processing is accomplished typically through pipeline commands. For more detail, a tutorial describing Signal Processing is available.

This section assumes that you have worked through the previous sections on this page. The following are steps for Interpolating and Filtering the TARGET data.

Make sure you are in the Signals and Events tab for the Processing section

1. Interpolate TARGET signals:

a. Signals and Events tab

b. Expand the TARGET folder

c. Right click on the ORIGINAL folder

d. Click Processing >

e. Click Interpolate

f. Click Done

See Signal Processing for an explanation of the default command parameters.

Note that a **PROCESSED** folder has appeared under the **TARGET** folder in the data tree.

2. Filter TARGET signals:

a. Expand the TARGET folder

b. Right click on the PROCESSED folder

c. Click Processing >

d. Click Filter

e. Click Done

See Processing for an explanation of the default command parameters.

Note that only a **PROCESSED** folder exists under the **TARGET** folder in the data tree (e.g. a new PROCESSED folder wasn't created). By default Visual3D uses only one PROCESSED folder, which contains the most recent processing done to a signal.

3. Review Processing History:

a. Expand the TARGET folder

d. Expand the PROCESSED folder

c. Left click on signal “LAS”

d. In the Data View Dialog, select Signal Processing History tab

Pipeline commands for Basic Signal Processing

Signals can be interpolated and filtered using the Interpolate and Lowpass_Filter commands.

Refer to Tutorial:_Command_Pipeline#Pipeline_SIGNAL_PROCESSING for an example.