Learning Visual3D

A COMPREHENSIVE INTRODUCTION TO USING VISUAL3D

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C-Motion's Visual3D Wiki website offers extensive information on how to use the software and biomechanics in general.

We do understand that for new Visual3D users, the sheer amount of information presented on the Wiki can be daunting.

For this reason, we have put together the following list as a recommendation of where to get started.

We recommend completing the first 5 sections using either the sample data provided on the wiki or using data you have collected in your own lab.

Please note that we also offer two-day training sessions either on site or in house (USA, CA, UK). Prior to training we recommend these tutorials be completed.

1. Downloading/Installing Visual3D
2. Workspace Overview
    a. Get familiar with the user interface
3. Model Building Tab
    a. Build a model
4. Workspace/Signals and Events Tab
    a. Load motion data
    b. Review data in Signals and Events tab
    c. Begin processing (interpolate & filter)
    d. Create Events
5. Reporting Tab
    a. Define joint angles (kinematics & kinetics)
    b. Define graphs
6. Introduction to pipelines
    a. Create a CMO
7. Other:
    a. Export Data
    b. Create Normal Database

Downloading/Installing Visual3D

The first step to using Visual3D is installing the software. The software can be downloaded from c-motion.com (Link 1). There is one account per institution and the password/log in information was e-mailed at the time of purchase.

Once the software has been downloaded, the installer (Visual3D_Setup_v*.exe) must be run (Link 2). If this is the first time Visual3D is being installed on a computer, you must download and install the license file. If you are just doing an update of Visual3D, you can run the installer, but do not need to install the license file.

New updates are released approximately every two weeks, so you should check for updates often. If support expires, you will not have access to download the latest version of Visual3D, so you should make sure to store and back up your .exe files.

Visual3D licenses are associated to a computer. You can move licenses by deactivating a current license and then reactivating on another machine. To deactivate a license from a computer, you must open Visual3D on the computer and go to Help -> Deactivate this Copy of Visual3D (Link 3).

Link 1 -
http://c-motion.com/v3dwiki/index.php?title=Getting_Started#Downloading_Visual3D

Link 2 -
http://c-motion.com/v3dwiki/index.php?title=Getting_Started#Installing_Visual3D_v5

Link 3 -
http://c-motion.com/v3dwiki/index.php?title=Getting_Started#Uninstalling_Visual3D

Workspace Overview

The Signal Processing tutorial aims to familiarize the user with the interface and some of the available features.

http://c-motion.com/v3dwiki/index.php?title=Tutorial:_Signal_Processing

Model Building Tab

The first step to using Visual3D is creating a model template (.mdh). Once a model template has been created, you can save the template and use it for other subjects. The model template is specific to the target names and marker set used by your lab. Visual3D has no standard or default marker set, but there are tutorials aimed to familiarize you with the options and dialog (Link 1).

In order to calculate clinically relevant ankle angles, many users create a virtual foot segment. This process is explained in the Foot And Ankle Angles tutorial (Link 2).

When calculating joint angles relative to the lab (for example: trunk with respect to lab), it is often necessary to create a virtual lab segment. This is helpful if your subject is walking back in forth in the lab (Link 3).

Link 1 -
http://c-motion.com/v3dwiki/index.php?title=YouTube_Tutorial:_Model_Building

Link 2 -
http://c-motion.com/v3dwiki/index.php?title=Tutorial:_Foot_and_Ankle_Angles

Link 3 -
http://c-motion.com/v3dwiki/index.php?title=Tutorial:_Virtual_Laboratory

Workspace/Signals and Events Tab

When building a CMO file in Visual3D, there are a few steps that you need to follow:

1. Load the static trial
2. Apply model template
    a. Specify the subject's height & weight
3. Load dynamic trials
4. Assign model to motion trials
5. Begin processing
    a. Filter data (Recalc)
    b. Modify Force Assignments
    c. Create gait events
    d. Load report template

The typical processing session tutorial outlines this process (Link 1).

Gait events can be created manually (Link 2), or using the Automatic Gait Events command (Link 3).

Link 1 -
http://c-motion.com/v3dwiki/index.php?title=Tutorial_Typical_Processing_Session

Link 2 -
http://www.c-motion.com/v3dwiki/index.php?title=Tutorial:_Gait_Events

Link 3 -
http://c-motion.com/v3dwiki/index.php?title=Automatic_Gait_Events

Reporting Tab

Joint kinematics and kinetics are defined using the Compute Model Based Data command (Link 1). This is where you would define the joint angles and moments. Using this command is described in the Model Based Computations tutorial (Link 2).

Once the signals have been created, you can plot them in the Reports tab (Link 3). Once you define a report template, you can save it as a .rgt file and apply to other subjects CMO files.

When a Compute Model Based Data command is created, it is added to the Recalc pipeline (Link 4). The Recalc pipeline is also saved in the rgt file.

Link 1 -
http://www.c-motion.com/v3dwiki/index.php?title=Compute_Model_Based_Data

Link 2 -
http://www.c-motion.com/v3dwiki/index.php?title=Tutorial:_Model_Based_Computations

Link 3 -
http://c-motion.com/v3dwiki/index.php?title=Tutorial:_Creating_a_Report

Link 4 -
http://c-motion.com/v3dwiki/index.php?title=Pipeline_Commands:RECALC_Pipeline

Introduction to pipelines

Every step in the **Workspace/Signals and Events Tab** tutorial (Link 1) can also be completed through the pipeline to streamline processing and ensure the same steps are followed during each processing session (Link 2).

Link 1 -
http://c-motion.com/v3dwiki/index.php?title=Tutorial_Typical_Processing_Session

Link 2 -
http://c-motion.com/v3dwiki/index.php?title=Tutorial_Basic_Pipeline_For_Processing_A_Session

Other

Data can be exported to text files (Link 1) so that it can be processed in statistical analysis software.

Large data sets can be processed using the CMO Library (Link 2). This is very useful when processing multiple subjects.

A normal database can be created (Link 3) and added to a report template (Link 4).

Link 1 -
http://www.c-motion.com/v3dwiki/index.php?title=Export_Data_To_ASCII_File

Link 2 -
http://c-motion.com/v3dwiki/index.php?title=CMO_Library

Link 3 -
http://www.c-motion.com/v3dwiki/index.php?title=Normative_Data_From_CMO_Library

Link 4 -
http://www.c-motion.com/v3dwiki/index.php?title=Using_Normative_Data_in_a_Report