

Computing a Time Normalized Average Event

Introduction

A customer wanted to add an annotation to the normative graph at the location of the corresponding **normative** event label. This would be equivalent to the option to [annotate a graph comprised of time based signals](#). Rather than leave the customer with no options, we explored the following “kludgy workaround”.

This example allows you to specify the normative event from the datatable (i.e. you can calculate the time of the normative event). [This example shows you another method which lets you explicitly define when the annotation should be created](#).

[You can download the sample files for this tutorial here](#).

Create Event stored in P2D

The first step is to store the value we want to create the annotation at. In this tutorial, the value is going to be stored GLOBAL::P2D::NORM_EVENTS::LTO.

- Option 1: Explicitly specify this value as 40% of the gait cycle (running data)
- Option 2: Calculate the average time toe off occurs from a normal database

Option 1: Explicit

Explicitly define the value:

```
Evaluate_Expression  
/EXPRESSION=40  
! /SIGNAL_TYPES=  
! /SIGNAL_FOLDER=ORIGINAL  
! /SIGNAL_NAMES=  
/RESULT_TYPES=P2D  
/RESULT_FOLDERS=NORM_EVENTS  
/RESULT_NAME=GLOBAL::LTO  
! /APPLY_AS_SUFFIX_TO_SIGNAL_NAME=FALSE  
;
```

Option 2: Calculate from database

Calculate the average value from the normal database:

1. [Load the database \(Step 1\)](#)

1. Run a script to calculate the % the event occurs during the gait cycle (example, when toe off occurs during the gait cycle). An example script is provided below:

```
Select_Active_File
/FILE_NAME=EACH_CMO_WORKSPACE
/QUERY=
;

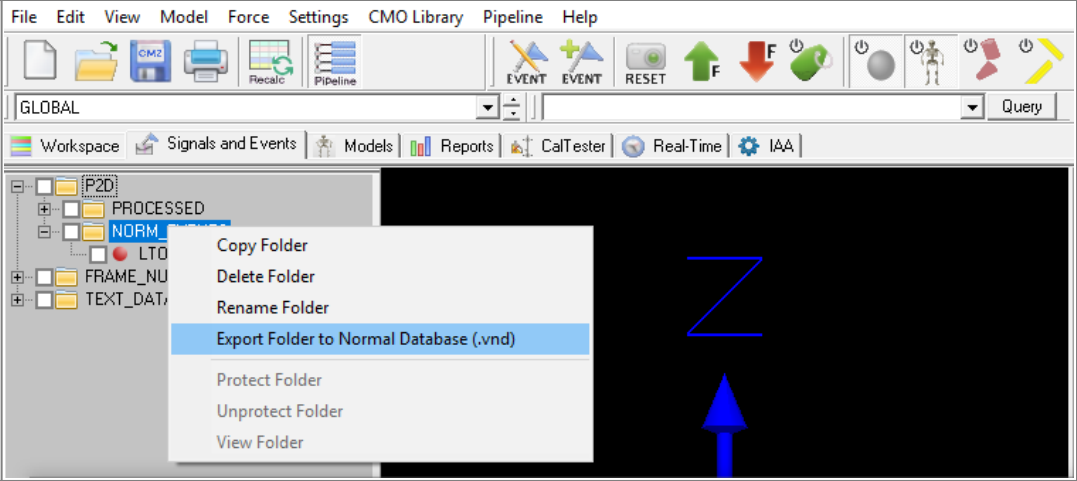
Metric_Time_Between_Events
/RESULT_METRIC_NAME=LStance
/RESULT_METRIC_FOLDER=EVENTS
/EVENT_SEQUENCE=LHS+LTO
/EXCLUDE_EVENTS=
! /GENERATE_MEAN_AND_STDDEV=TRUE
! /APPEND_TO_EXISTING_VALUES=FALSE
;

Metric_Time_Between_Events
/RESULT_METRIC_NAME=LGaitCycle
/RESULT_METRIC_FOLDER=EVENTS
/EVENT_SEQUENCE=LHS+LHS
/EXCLUDE_EVENTS=
! /GENERATE_MEAN_AND_STDDEV=TRUE
! /APPEND_TO_EXISTING_VALUES=FALSE
;

Evaluate_Expression
/EXPRESSION=100*GLOBAL::METRIC::EVENTS::LStance_MEAN/GLOBAL::METRIC::EVENTS::
:LGaitCycle_MEAN
/RESULT_NAME=GLOBAL::LTO
/RESULT_TYPE=P2D
/RESULT_FOLDER=NORM_EVENTS
;
```

Save P2D File

You can then export the P2D data as a Normal Database (Normal_Data_Events.vnd)

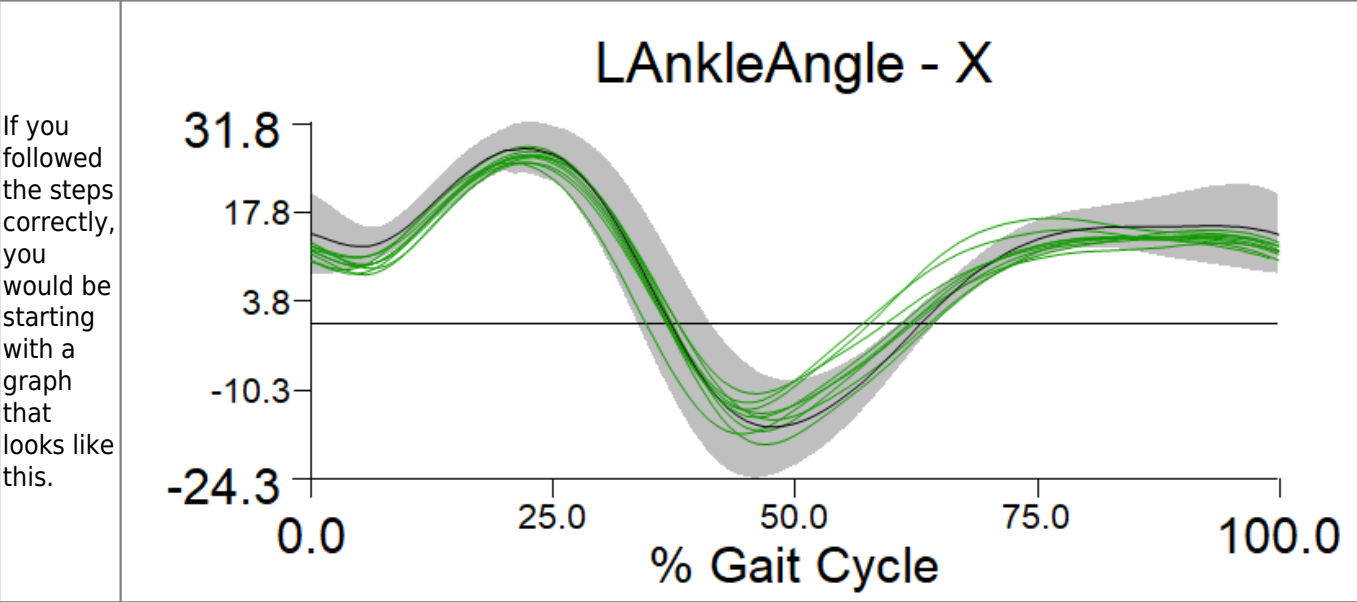


The screenshot shows the Visual3D software interface. The 'Workspace' panel on the left displays a tree structure with folders: 'P2D', 'PROCESSED', 'NORM', 'LTO', 'FRAME_NUM', and 'TEXT_DATA'. A right-click context menu is open over the 'NORM' folder, with the option 'Export Folder to Normal Database (.vnd)' highlighted. The main window shows a 3D model of a foot with a blue arrow pointing to the 'Z' axis.

Plot Event stored in P2D

Getting Started

It's assumed that you have followed the steps described [here](#).



Load the P2D Data

Loads the P2D file which contains the average events:

1. **File → Open**
1. Select the **Normal_Data_Events.vnd** file

Option 1: Manually Graph Event

* Annotation Style: **Vertical Line**

* Color: **Black**

* Size: **Normal**

* Event Name or Numeric Value:
GLOBAL::P2D::NORM_EVENTS::LTO

* Check **“Average Event or Numeric Value”**

Annotations

Annotation Style

Vertical Line

Color

Black

Custom

Size

Normal

Event Name or Numeric Value

GLOBAL::P2D::NORM_EVENTS::

Select Label or Enter Frame value

All Graphs

Average Event or Numeric Value

OK

Cancel

Option 2: Pipeline Graph Event

```
Add_Graph_Annotation
/PAGE_NUMBER=1
/COLUMN_NUMBER=1
/ROW_NUMBER=1
```

```
/DRAW_ORDER=2
/ANNOTATION_EVENT=GLOBAL::P2D::NORM_EVENTS::LTO
/ANNOTATION_STYLE=Vertical Line
/ANNOTATION_COLOR=Black
! /ANNOTATION_SIZE=Normal
/ANNOTATION_GLOBAL=FALSE
/ANNOTATION_AVERAGE_EVENT=TRUE
;
```

Final

