Force Assignment Quality Assurance

Background

Force Assignments are used throughout Visual3D - and it's important to make sure they're correct.

If your force assignments are correct, you know that events created using the Automatic Gait Events command are correct, and your kinetics will be correct.

For information about how force assignments are created, see here.

Command

```
Force_Assignment_Quality_Assurance
! /MIN_STANCE_TIME=0.2
! /MAX_STANCE_TIME=1.0
! /MIN_STANCE_GRF=0.95
! /MAX_STANCE_GRF=1.3
! /MAX_COP_PATH_DISTANCE=4
! /DELETE_TEMPORARY_EVENTS=TRUE
! /ADD_BAD_EVENT_ON_DELETE=FALSE
! /FP_MIN=40
;
```

Breakdown

This command uses multiple tests to check if the force assignments are created correctly. Users should still manually check that force assignments are created correctly.

COP Distance Test

Force assignments are created when a segment is within a specified distance from the center of pressure. This distance is stored as the Segment_to_COFP_Distance in the model template.

It is always recommended to leave this value as 0.2 meters, unless you have a very good reason to change this. For some reason, this value has been set to 20 meters in a lot of user's templates. If you receive this warning, it is recommended to just change the Segment_to_COFP_Distance in your model template to 0.2 meters.

Filter Test

This check will not modify anything, but a warning will be displayed to ensure your filtering is set up as desired.

Since the FORCE, COFP, and FREEMOMENT folders are calculated from the ANALOG folder, it is recommended to only filter the ANALOG folder. If you choose to filter the FORCE folder instead, you should make sure to filter the FORCE, COFP, and FREEMOMENT folders.

You do not want to filter the ANALOG and the FORCE, COFP, and FREEMOMENT folders, because then you are filtering your data twice.

Visual3D will only create the FORCE, COFP, and FREEMOMENT folders from the processed ANALOG signals if you have specified to use the Processed Analog Data. A warning will be displayed if you have filtered the ANALOG signals, but have not set Visual3D to use the processed Analog data.

FP Zero Test

In your force platform parameters, there is an option to zero the force platforms using a specified frame range. This is specified in your motion capture system, and is called the FP_ZERO parameter.

A segment is assumed to be on the platform if the projection of the proximal end of the segment falls on the force platform and if the distance from the proximal end of the segment to the force platform is less than the MIN_SEG_HEIGHT parameter.

Nothing in your file will be modified from this test, but a warning will be displayed for you to check the zero values

Remove Incomplete Assignment Test

You do not want to calculate kinetics using incomplete assignments, so if the trial starts with the segment on the platform or ends with the segment off the platform, the assignment is removed.

COP Distance Test

Uses:

- MAX_COP_PATH_DISTANCE

The path distance the COP travels over the force assignment is calculated.

The signal used internally is normalized to the segment length

GRF Max Test

Uses:

- MIN_STANCE_GRF=0.95

- MAX_STANCE_GRF=1.3

The maximum GRF over each force assignment is calculated.

The signal is normalized to the mass of the subject.

Stance Time Test

Uses:

- MIN_STANCE_TIME=0.2
- /MAX_STANCE_TIME=1.0

The stance time for each force assignment is calculated.

It is expected that the stance time will be above 0.2 seconds and below 1 second. The user should modify this as necessary.

Segment Position Test

For each force assignment, the proximal and distal end of the segment is projected onto the force platform. If the proximal and distal ends are not on the force platform for the entire assignment, the force assignment is removed.