Driveline

Through the OpenBiomechanics Project, Driveline Baseball has made elite-level motion capture data publicly available. The data can be downloaded from Driveline's GitHub repository.

Having access to large datasets is a great asset, but processing these large datasets can take time (and patience). Inspect3D is designed to streamline this process. The steps in this tutorial describe how to create CMZ files from the pitching and batting data sets, then inspect and group the data in Inspect3D.

Download

First, download the associated metadata and .v3s files from the repository clicking **<> code** and **download zip**.
Next, download the .c3d files from the Release list (Assets → Download ZIP).

Data Structure Outline in openbiomechanics-main folder:

- baseball_hitting
  - code
    - v3d
      - CMO.v3s
      - model
        - hitting_v1_model_hybrid.mdh
- hitting_c3d
  - c3d
- baseball_pitching
  - code
    - v3d
      - CMO.v3s
      - model
        - v6_model_hybrid_lm.mdh
  - pitching_c3d
    - c3d

Download the HAS-Motion Specific Files:

1. Filter Script
2. Event Script
    1. Note: The event script updates the force platform parameters. Visual3D automatically combines the forces when one foot is in contact with two plates but requires the surfaces to be parallel (or close to). This script adjusts the corners which are coincident to allow the forces to be combined. This script is specific to this data set.

Additional files are provided as examples, but not necessary for processing (files to automatically build group definitions, a subset of group definitions, and sample workspaces).

Outline

1. Build CMZs
    1. This step is done once, or any time you collect more data
2. Build Group definition
3. Inspect data

Build CMZ Files

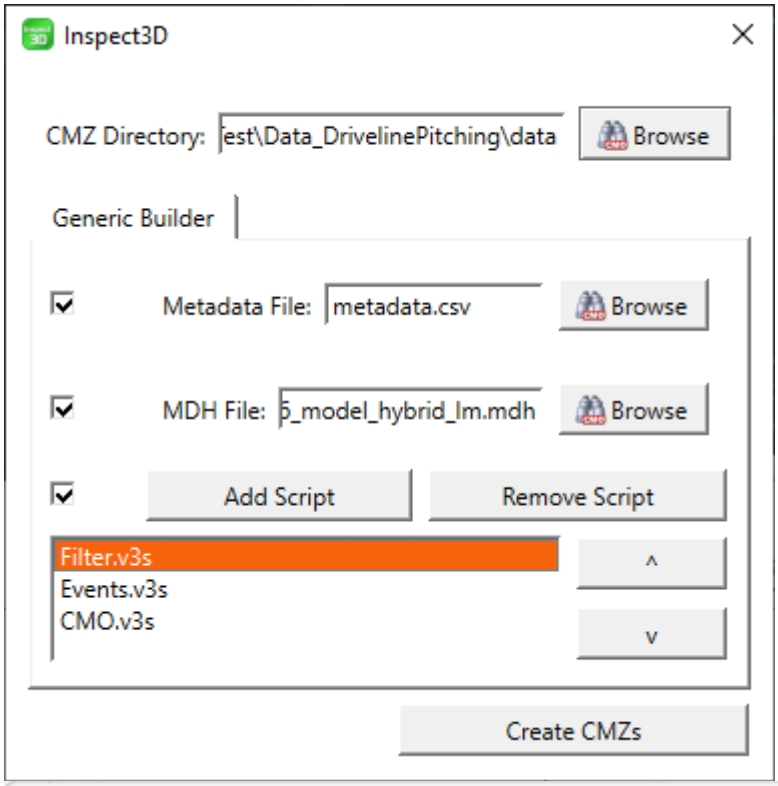
Pitching

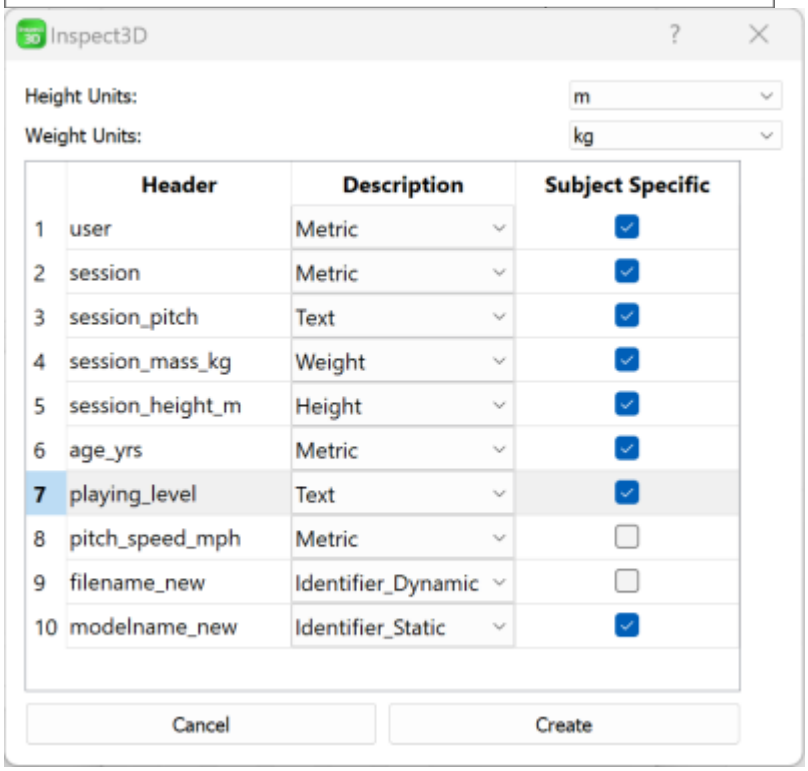
Build CMZ Files for Pitching Data:

- Click Load Library Toolbar option
- In Library Path Dialog, click **Build CMZs**

- In the Build CMZ Dialog:
    - Set the path to:C:\...\openbiomechanics-main\baseball_pitching\data\c3d
    - Metadata File: C:\...\openbiomechanics-main\baseball_pitching\data\metadata.csv
    - MDH File: C:\...\openbiomechanics-main\baseball_pitching\code\v3d\model\v6_model_hybrid_lm.mdh
    - Add the following scripts and ensure they are in the correct order:
        - C:\...\CMotion Files\Filter.v3s
        - C:\...\CMotion Files\Events.v3s
        - C:\...\openbiomechanics-main\baseball_pitching\code\v3d\CMO.v3s

- Click **Create CMZs**
- Metadata: Check “Subject Specific” next to playing_level
- Load Library: Once the CMZ files have been created, in the Library Path Dialog make sure the path is set correctly and click **Load**.





Hitting

Driveline Hitting Biomechanics

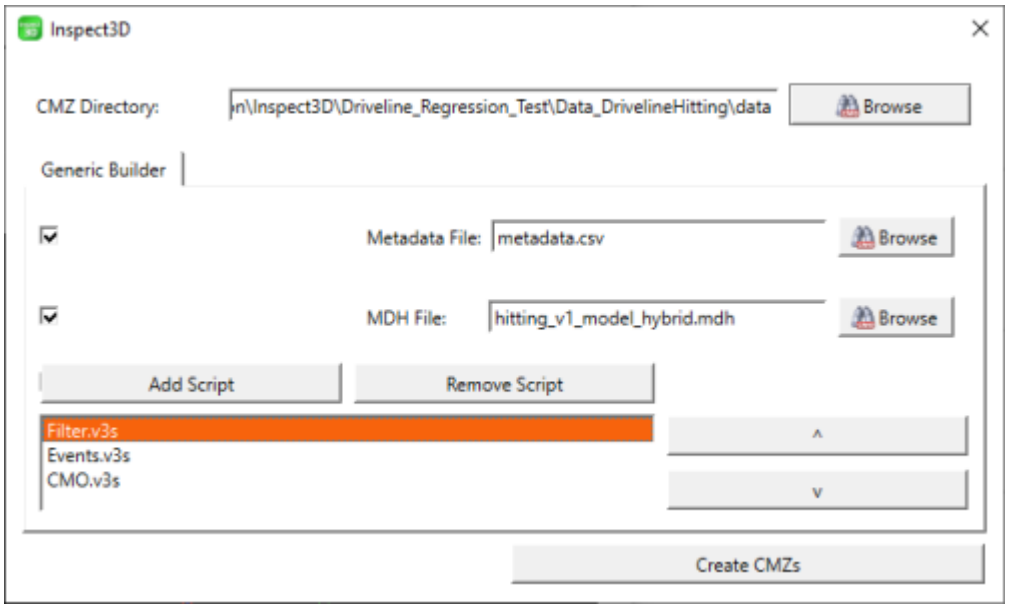
Build CMZ files for Hitting data:

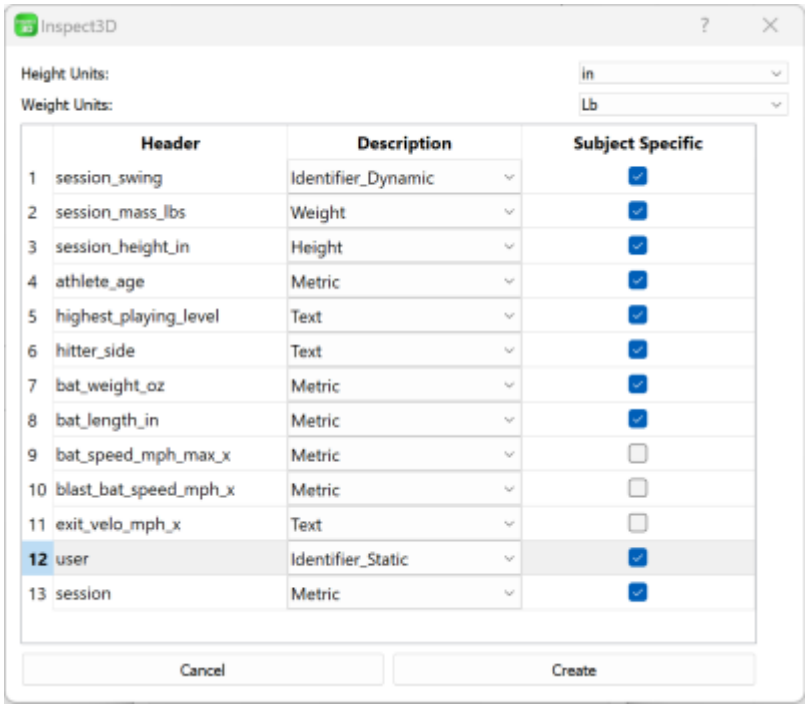
- Click Load Library Toolbar option
- In Library Path Dialog, click **Build CMZs**

- In the Build CMZ Dialog:

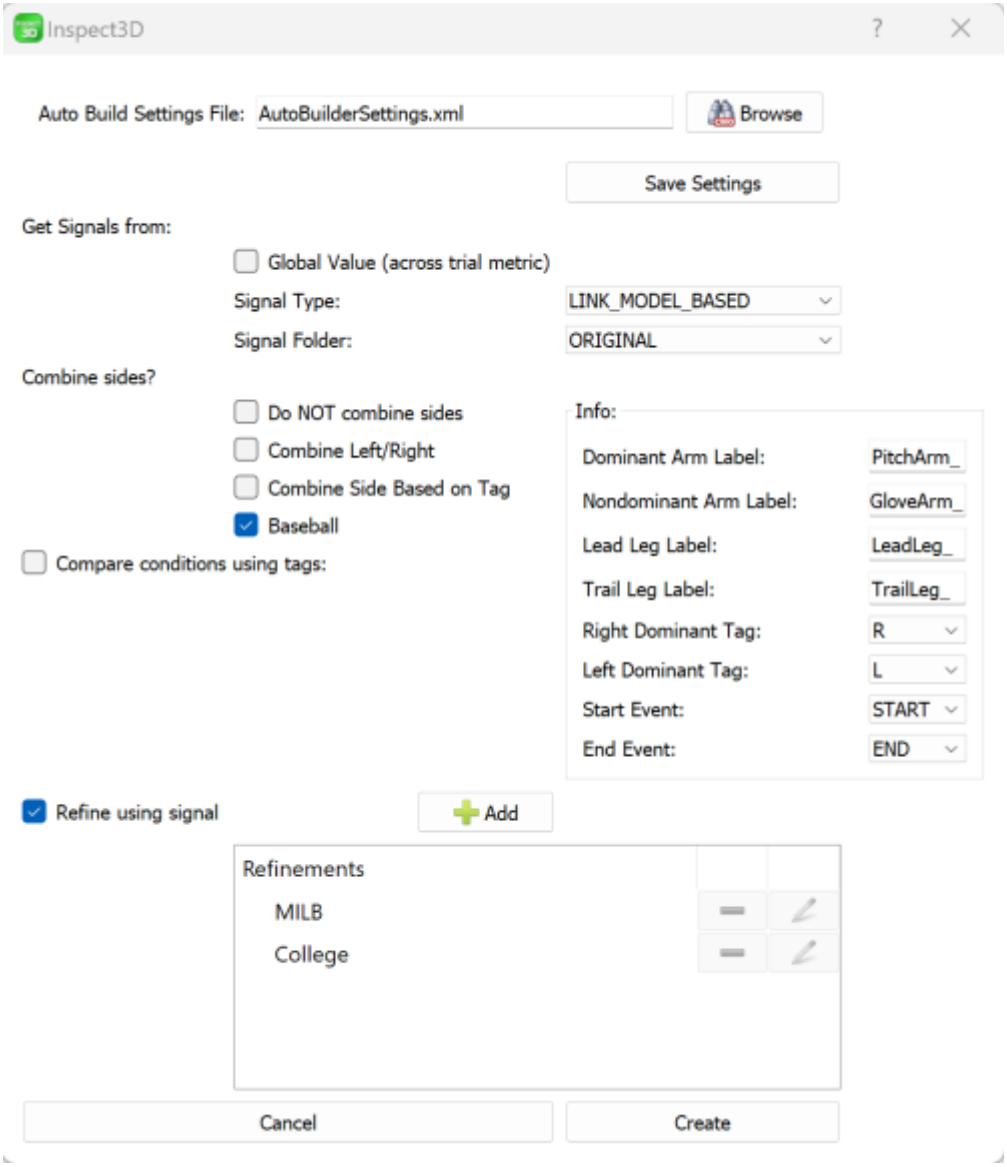
    - Set the path to: C:\...\openbiomechanics-main\baseball_hitting\data\c3d
    - Metadata File:C:\...\openbiomechanics-main\baseball_hitting\data\metadata.csv
    - MDH File: C:\...\openbiomechanics-main\baseball_hitting\code\v3d\model\v6_model_hybrid_lm.mdh
    - Add the following scripts and ensure they are in the correct order:
        - C:\...\CMotion Files\Filter.v3s
        - C:\...\CMotion Files\Events.v3s
        - C:\...\openbiomechanics-main\baseball_hitting\code\v3d\CMO.v3s

- Click **Create CMZs**
- Metadata:
    - Height Units: in
    - Weight Units: Lb
    - session_swing: Identifier Dynamic
    - user: Identifier Static
    - Check “Subject Specific” next to playing_level, side, bat weight/length
- Load Library:* Once the CMZ files have been created, in the Library Path Dialog make sure the path is set correctly and click **Load**.




Inspect3D
Height Units:
in
Weight Units:
Lb
Header
Description
Subject Specific
1 session_swing Identifier_Dynamic
2 session_mass_lbs Weight
3 session_height_in Height
4 athlete_age Metric
5 highest_playing_level Text
6 hitter_side Text
7 bat_weight_oz Metric
8 bat_length_in Metric
9 bat_speed_mph_max_x Metric
10 blast_bat_speed_mph_x Metric
11 exit_velo_mph_x Text
12 user Identifier_Static
13 session Metric
Cancel
Create

Group Data



- Click Group Definitions Toolbar option
- Select **Group Definitions**

- In the **Group Definitions** dialog:
  - click **Auto-Populate Groups**
  - Choose the Signal Type and Folder
    - Combine Sides?
      - Select **Baseball** and options will appear on right
      - For Hitting change default arm labels to LeadArm_/TrailArm_
    - Refine using signal:
      - Add refinements (ex. group based on playing level)

- Alternative: Click **Browse** to load these settings from an XML file to compare two playing levels (MILB vs. College).
  - C:\...\CMotion Files\AutoBuilderSettings_Pitch.xml
  - C:\...\CMotion Files\AutoBuilderSettings_Hit.xml

- Click **Create**

- In **Group Definition** dialog, delete groups you are not interested in calculating.
- Click **Calculate All Groups**
- Inspect your data!

From:
https://has-motion.com/wiki/ - **Wiki Documentation Site**

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