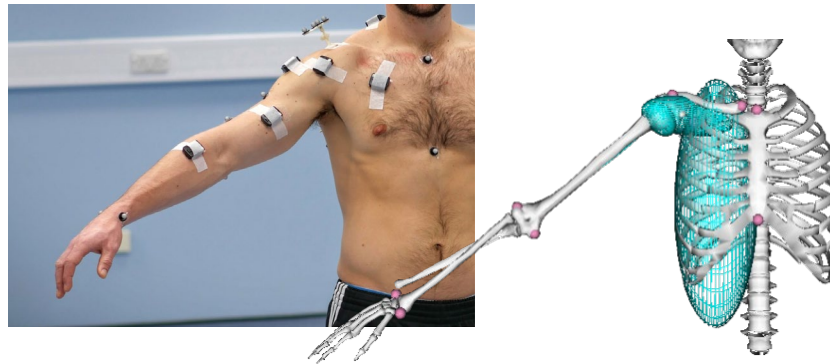# Data import – Market set setup

OpenSim Workshop 2018

Importing experimental data

- Import file format:
  - .trc
  - .mot
  - setup files (xml)
- Pre-processing experimental data is not trivial
- But:
  - Some pre-processing tools are available
  - Pre-processing gets easier after you've done it once

Importing experimental data

- Tip #1: Collect high-quality data suitable for simulation

Importing experimental data

- Tip #1: Collect high-quality data suitable for simulation
- Tip #2: Assess whether existing pre-processing tools meet your needs

Importing experimental data

- Tip #1: Collect high-quality data suitable for simulation
- Tip #2: Assess whether existing pre-processing tools meet your needs

Also: Biomechanical ToolKit, an open-source framework to visualize and process biomechanical data (http://biomechanical-toolkit.github.io/)
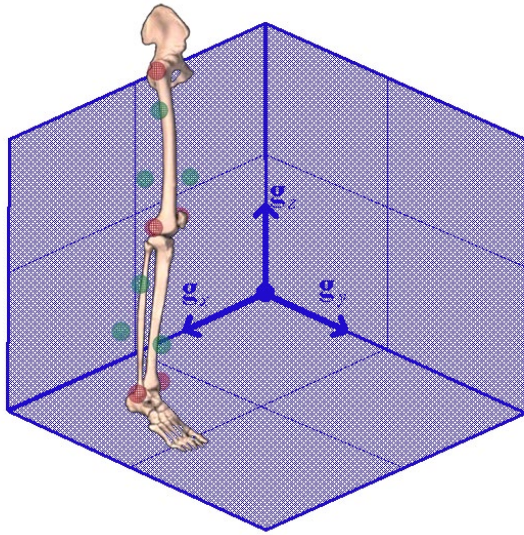
Marker Files (.trc)

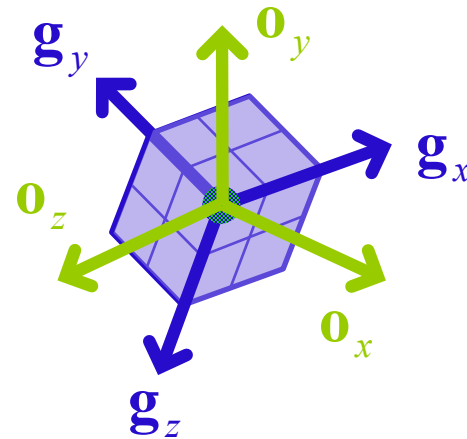**The *.trc* file format specifies the position of markers from a motion capture trial**

- **First 3 Lines: Header specifying trial info**

- **4th Line: Column labels containing the marker names**

- **5th Line: Identifies component and marker number**

Coordinate Systems
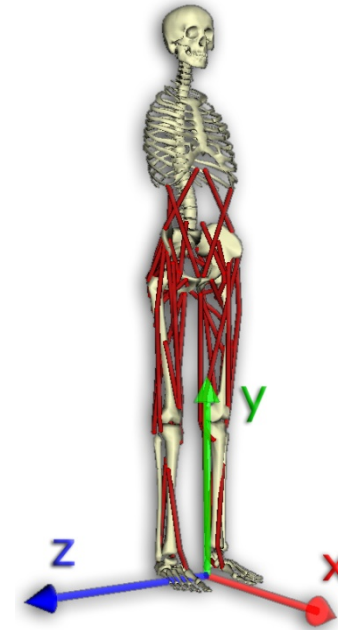
**Measure Markers in
Lab Coordinate System**

coordinate frame g

**OpenSim Model
Coordinate System**

coordinate frame O

Rotation Matrix

$$^{A}\mathbf{R}^{B} = \begin{bmatrix} r_{xx} & r_{xy} & r_{xz} \\ r_{yx} & r_{yy} & r_{yz} \\ r_{zx} & r_{zy} & r_{zz} \end{bmatrix}$$

Motion (.mot) & Storage (.sto) Files

The *.mot* & *.sto* file formats contain many different types of data, including joint angles and moments, excitations, activations, and forces.

- **Motion files (*.mot*) require uniform time spacing**

- **Column labels can be ambiguous (i.e., be aware of what file you are viewing)**

- **All units are SI (i.e., meters, Newtons, etc...)**

Ground Reaction Force Data

Force data must be represented in a very specific order:

BODY 1 FORCE (x ,y ,z)	BODY 1 COP (x ,y ,z)	BODY 2 FORCE (x ,y ,z)	BODY 2 COP (x ,y ,z)	BODY 1 TORQUE (x ,y ,z)	BODY 2 TORQUE (x ,y ,z)

NOTE: Column labels must be exactly as shown!

Demo of Data Previewer