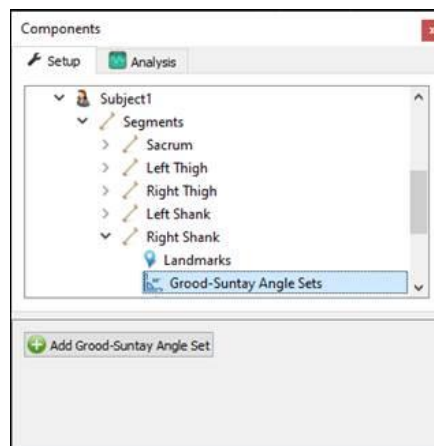


## The MotionMonitor xGen Software Guide: Defining Grood & Suntay Angles

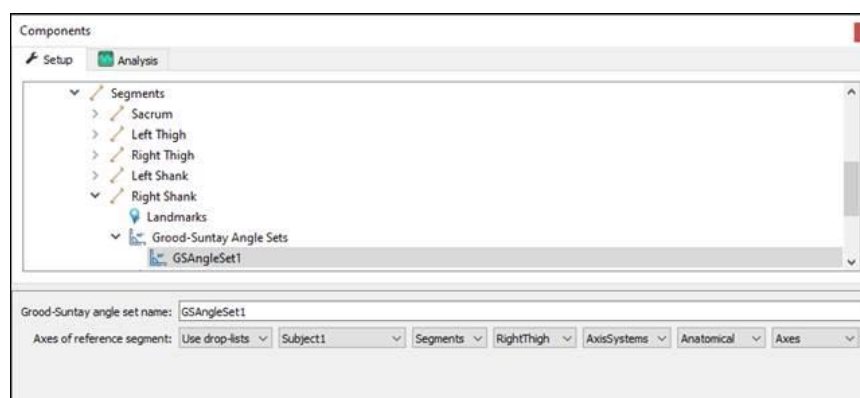
This document provides an example for how to define Grood-Suntay Angle Sets in The MotionMonitor xGen. Grood-Suntay angle sets are computed as described in *Grood E., Suntay W. "A Joint Coordinate system for the Clinical Description of Three Dimensional Motions: Application to the Knee", Trans. ASME 105:136-144, 1983* and automatically provide Flexion, Abduction and Rotation angles according to the aforementioned joint coordinate system definition. These angle sets can be associated with either user-defined or Anatomical axes segment coordinate systems and added for any body segment.

Below outlines an example for how to define a Grood-Suntay Angle Set based on Anatomical axes, but the same process would follow for user-defined axes. Grood-Suntay angles based on Anatomical axes can be defined at any time prior to data collection or after (must be running version 3.53a or later). User-defined axes must be defined at the time of subject setup. For more information on user-defined axes, please review our [tutorial videos](#).

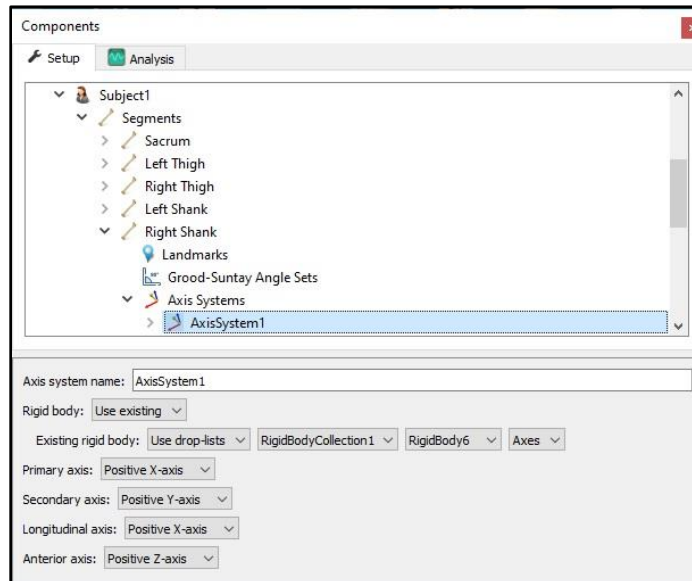
First, a Grood-Suntay Angle Set needs to be added for the distal segment of the joint of interest (The Shank for the Knee joint in this example). The Grood-Suntay Angle Set is added directly to the Right Shank using the "Add Grood-Suntay Angle Set" button. Since the Grood-Suntay angle set was added directly to the Right Shank, it will use the Right Shank's Anatomical Axes.



Then, the Axes system for the reference frame to be used for the Grood-Suntay angle set that was just added needs to be selected. In this example, the Thigh's Anatomical Axes were selected (a segment axes for the proximal segment, the thigh). So, the Grood-Suntay Angle Set will be looking at the Right Shank's Anatomical Axis System relative to the Right Thigh's Anatomical Axis System.



For a Grood-Suntay Angle Set added to an Anatomical Axes system, the setup is complete. For one that was added to a user defined axes system, the following step needs to be completed. The Primary and Secondary axis drop-list selections for a user-defined axis system determine the layout of the Axis System based on the Primary Axis Proximal Point, Primary Axis Distal Point and Secondary Axis Points used to define the Axis system. This is what is seen in the Animation window for the Axis System. The Longitudinal and Anterior axis drop-list selections here need to be selected to match what are actually the longitudinal and anterior axes for the Axis system that are seen in the Animation window.



Then, repeat this process for as many joints as you want to have Grood-Suntay Angles Sets for. Data can then be defined and displayed in graphs, exported, etc., as seen in the images below.

