

## **User Actions**

- a. Edit the setup file subject\_setup\_scale\_cmc.xml to specify the settings for the cmc command. All parameters, input files, and output files are specified within this setup file. Detailed comments are contained within the setup file describing each parameter, input file, and output file. There are no restrictions on the names of files, although the conventions shown below are typically followed. In the file names below, it is assumed that the user will make the appropriate substitution for "subject" and "trial##".
- b. Execute the command "cmc -Setup subject\_setup\_cmc.xml". This command produces a file containing the muscle excitations that will drive the scaled model (subject.sim) to track the specified generalized coordinates (subject\_trial##\_q.sto). The excitations are necessary to run the gait simulation and are necessary for most all investigations, including running forward simulations (forward) and perturbations (perturb).

# subject.sim

OpenSim gait model scaled to a subject with segment markers relocated to match experimental marker data.

#### subject setup cmc.xml

Setup file for running the RRA algorithm. Input parameters and files are specified here.

#### cmc tasks.xml

File containing the task objectives for CMC. This file specifies which generalized coordinates are tracked as well as the gains on position and velocity errors.

#### cmc actuators.xml

File specifying the characteristics of actuators used to apply residual forces during the cmc solution. It may be necessary to apply additional residuals for long simulations.

## cmc constraints.xml

File specifying constraints on the muscle excitatons.

### subject\_trial##\_q.sto

Motion file containing the generalized coordinates that are to be tracked. This file is typically produced in the **rra** step of the workflow.

### subject trial## residuals.sto

Storage file containging the final residuals that need to be applied to the model. This file is typically produced in the **rra** step of the workflow. 3. Track the generalized coordinates using Computed Muscle Control (CMC).

#### cmc

cmc -Setup subject\_setup\_cmc.xml

# subject\_trial##\_excitations.xml

File containging the excitations that drive the scaled subject model to track the input generalized coordinates.

Investigate
forward and/or perturb