# Release notes AMMR1.4.1

This release is identical to 1.4 except for a few corrections in the GaitLowerExtremity and C3DProject models, for details please refer to the description of these models below.

This release introduces a new application, the C3DProject, which makes use of several newly introduced GUI features. Additionally it contains several improvements to the LegTD model, thanks numerous user contributions, which are most appreciated.

The models run with AMS ver.  5.1

## Applications:

- The model C3DProject has been added, this model replaces the GaitLowerExtremityProject model. C3DProject features many new GUI facilities making use of the project pane introduced in AMS5.0. The project pane now displays its contents in html, making it possible to show tables in which model parameters can easily be modified without manipulating the script.
  The aim of the model is to facilitate the process from mocap data to a musculoskeletal model. A predefined workflow guides the user through the necessary steps and creates links to variables which would typically need to be adjusted. Additionally there are predefined sequences built into the model that makes saving and loading of data easier.

  In AMMR1.4.1 these changes has been made compare to AMMR 1.4:
  - “update values” operation added in the inverse dynamic macro.
  - Typo corrected in TrialSpecificData
  - CreateMarkerClassTDWidget updated to CreateMarkerClassTDWidgetV2 in InverseModel.Main

- GaitUniMiami and GaitUniMiamiTDRightLeg  has been removed from the repository because they were outdated and made use of external motion optimization which is now embedded into AMS

- GaitUniMiamiTD has been updated to run with the internal AMS over-determined kinematic solver. Note that this model can also run with the right or left leg separately and can be used instead of the GaitUniMiamiTDRightLeg

- In GaitLowerExtremity a few errors has been corrected compared to AMMR 1.4
  - The macro folder was declared twice
  - Motion text files were incomplete.

## LegTD

- The scaling of the muscle attachment nodes on the pelvis, which are automatically added to the pelvis when a leg is attached, has been changed. The new scaling ensures that, when nonlinear scaling is applied to the pelvis, these nodes will be scaled correctly. These nodes are special because they are nodes placed inside a rotated hip node. Compared to previous versions this change has a small impact when running models using lengthmassfat scaling laws.

- For the following muscles the Lfbar value has been reduced by 2 cm :
    - VastusMedialisInferior2
    - AdductorMagnusProximal1 and 2
    - Pectineus1,2,3 and 4

  This change is motivated in the fact that Lfbar was previously longer than the total un-scaled muscle length. This resulted in calibration errors because it left no Lt0 left to be optimized by the calibration operation.

- Hip ligament nodes have been added to the femur.

- The knee joint axis has been updated in accordance with the original data set. This changes the knee kinematics but has limited influence when the model is driven with motion capture data.

- The cylinder representing the wrapping surface of the femoral Epicondyle and used for wrapping of the Gastrocnemius lateralis and medialis muscles has been slightly changed to better correspond with the original data.

- The Talus segment has a mass and the mass of the foot segment has been reduced equivalently.

- The PatellaFemurJoint axis has been changed to ensure right and left leg symmetry; this change affects the left leg slightly.

- The Rectusfemoris2 attachment node on the pelvis has been modified to correspond with the original data.

- The standard parameters for the shank and pelvis have been adjusted to better fit the un-scaled lengths of the bones.

- Strength scaling of the muscles has been added.

- The definition of the ISB coordinate system of the femur has been updated.

### Arm

- The Subscapularis wrapping surfaces were updated to ensure a more reliable behavior of the wrapping algorithm.
- The scaling of the muscle attachment nodes, which the arm automatically adds to the trunk when an arm is inserted onto the trunk, has been changed. The purpose is to ensure that the nodes can be scaled correctly if nonlinear scaling laws were applied to the trunk. These changes do not affect the analysis results.

### ToolBox/Mocap

- New “create marker” classes have been created, introducing widgets. This allows manipulation of the marker position through the GUI.
- All force plate classes have been equipped with a new contact detection formulation which ensures a better detection of the limb contact with the force plate.
- Updates on ForcePlateType3 for the z distance of the origin and for the COP drawing.

### ToolBox/FrictionContactMuscles

- The visualization of the trigger cylinder has been changed to ensure it is always displayed correctly