XARKIN ANIMATION FOR BLENDER (a4b)

XARKIN
SOFTWARE

GETTING STARTED

Getting started with Xarkin Animation for Blender (a4b) just requires a simple registration. Users are only required to provide an email address and a name for their account that must be unique within the overall service.

Xarkin uses the account name when storing your character mappings and captured of poses and gaits.

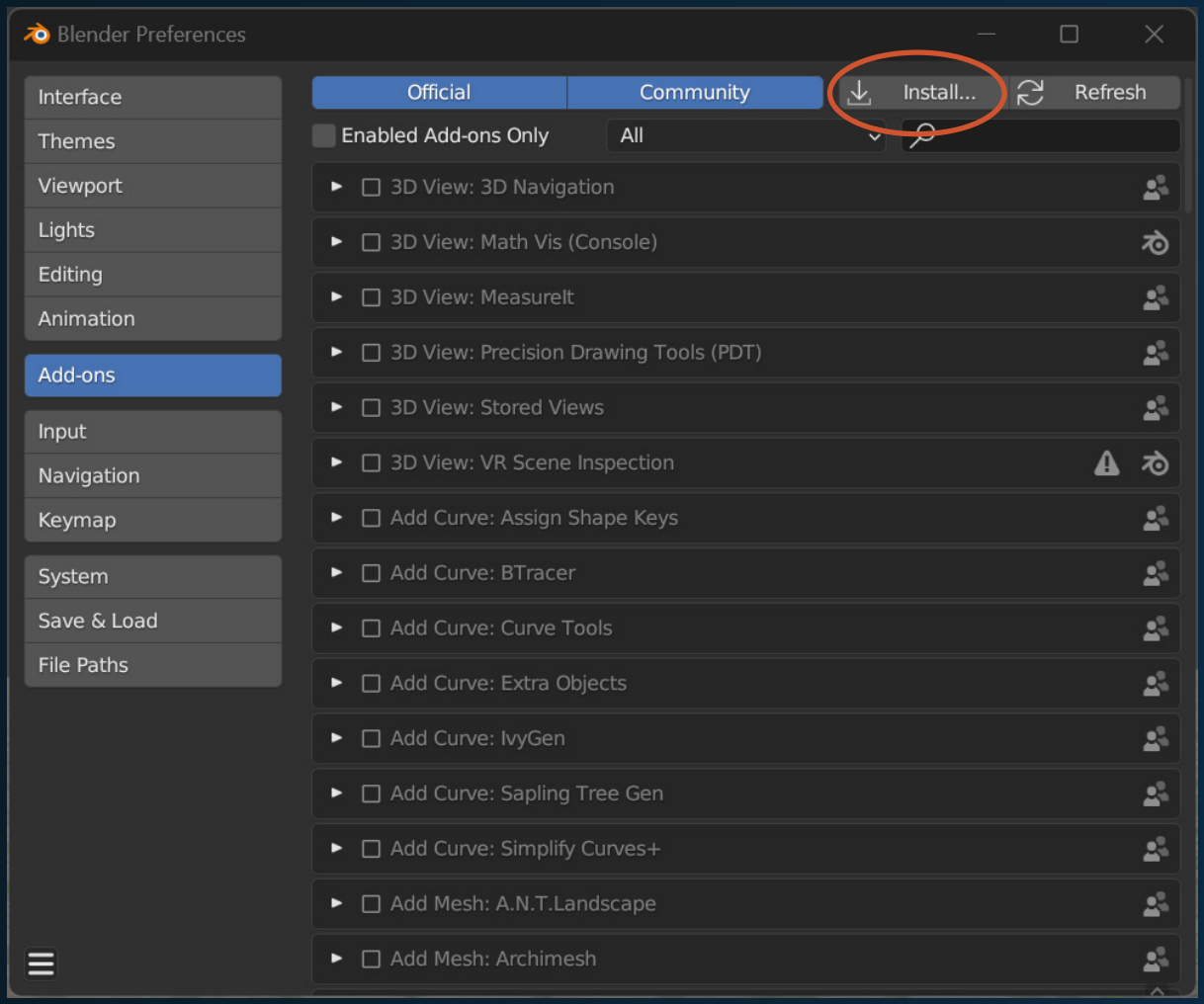
Once registered, simply download the a4b add-on and install this add-on in Blender.

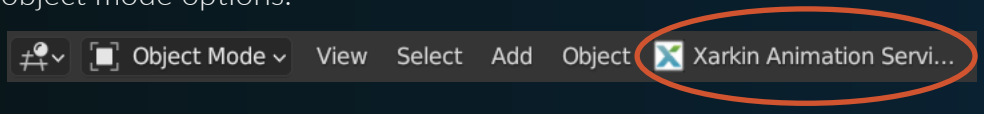
To install the add-on, simply select ***Edit*** > ***Preferences*** from the Blender file menu, select Add-ons, click Install and select the downloaded add-on file.

The software is provided as a zipped file. You do not need to unzip the file for installation.

Blender will display a message in the status bar at the bottom when the installation is complete.

The add-on will be visible to the right of the object mode options.

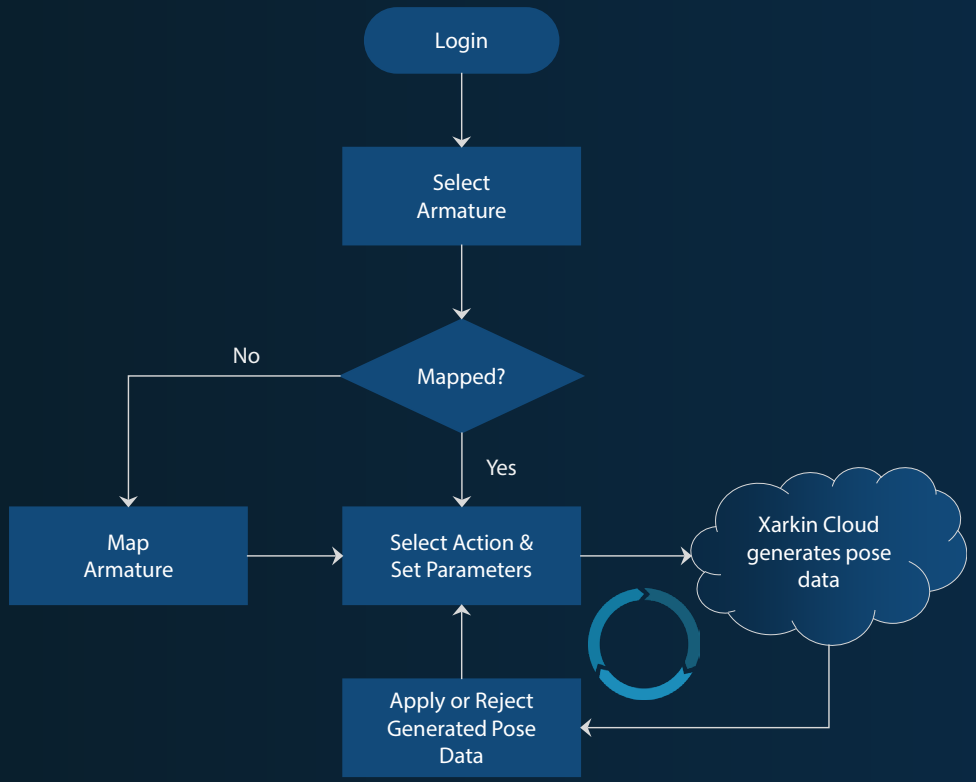




a4b MOTION GENERATION FUNDAMENTALS

The a4b add-on provides all the capabilities required for generating physics-based pose data for a rigged humanoid character in Blender. The pose data generated by Xarkin is yours and is free of any encumbrances. a4b is free for use with humanoid characters in Blender.

The steps in the process are straight forward.



Login — You will be automatically logged in on any machine where you have previously logged in.

Select — Select the armature you want to move.

Map — Select a mapping for your armature, a4b automatically identifies mappings for most Mixamo™ characters. If your armature doesn't have the same structure and naming, you can map your armature to the Xarkin motion model.

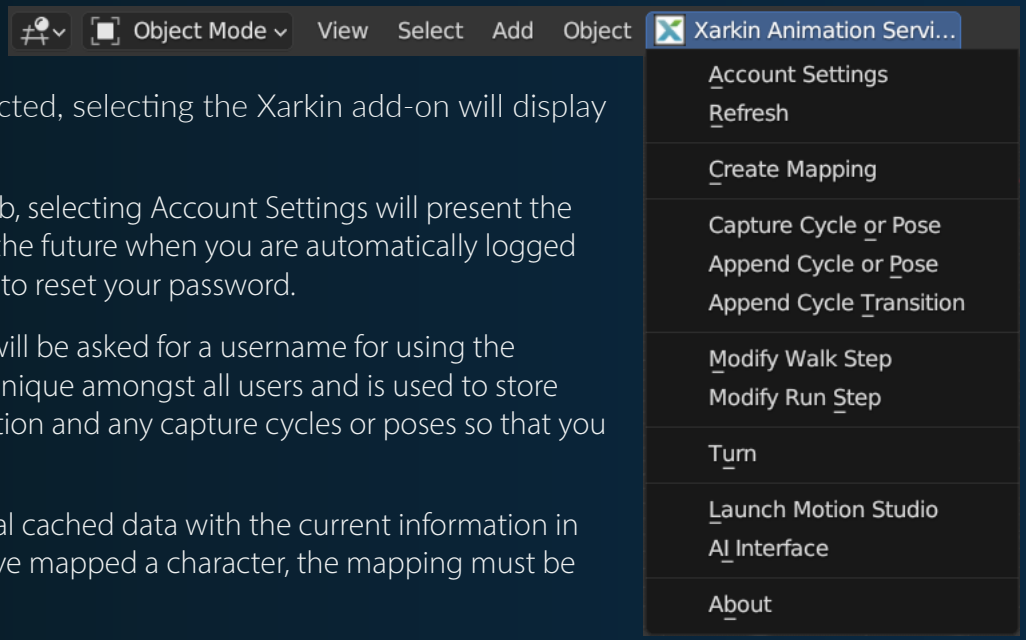
Because Xarkin is physics-based, you can select from various mapped profiles such as Athletic or Overweight. Even if your character is a Mixamo character, you can use mapping to define a mass profile.

Action — You can select the action you would like to perform and set the parameters needed for the motion request. This request will be sent to Xarkin's cloud services for generation of the pose data.

Apply — Once the motion is generated, you can choose to apply the motion to your character or reject the motion. If applied, the pose data from the cloud will be applied to your armature. How fast this takes, will depend upon the number of frames that have been generated.

Continue — This is an iterative process where you can apply motion, remove it with Ctrl-Z and try again.

CAPABILITIES SUMMARY



When in Object Mode and, usually, with an armature selected, selecting the Xarkin add-on will display the various options available.

Account Settings

When first logging into Xarkin a4b, selecting Account Settings will present the login. Subsequent to this and in the future when you are automatically logged in, you can use Account Settings to reset your password.

As part of your registration, you will be asked for a username for using the service. This username must be unique amongst all users and is used to store your character mapping information and any capture cycles or poses so that you can use it in the future.

Refresh

Refresh will synchronize your local cached data with the current information in the cloud. For example, if you have mapped a character, the mapping must be made local.

Create Mapping

With a humanoid armature selected, selecting Create Mapping will launch an application in your browser for mapping your character to the Xarkin motion model which a4b uses. a4b will automatically detect and map various supported Mixamo™ armatures. Otherwise, individual joints in the armature can be attached to the appropriate corresponding joint in the model.

In addition to mapping the segments that make up the armature, mass profiles can be created. Xarkin software generates physics-based accurate motion based upon not only the mapped armature but also the mass profile as well. So, even if your armature is based upon Mixamo™, you may want to define the desired mass profile for your character.

Capture Cycle/Pose

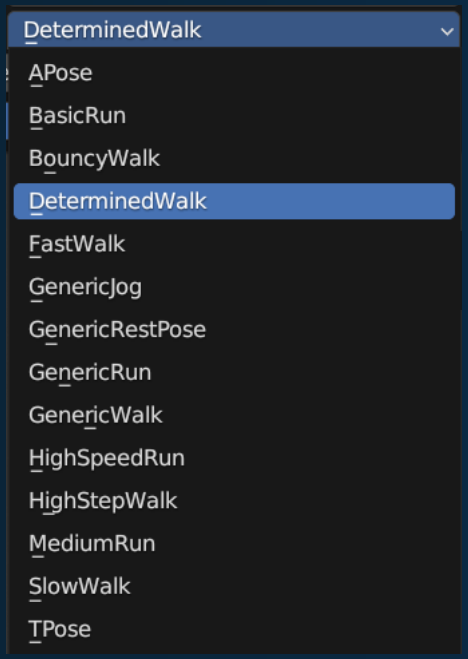
a4b can capture existing character poses and motions. The captured pose or cycle can then be used with the same character or re-targeted to another character provided they share the same basic mapping information.

CAPABILITIES SUMMARY

Launch Xarkin Studio	This option is not currently available. Xarkin is currently integrating the existing Motion Studio product with the newer a4b cloud deployment. With Motion Studio, animators can create and customize specific motion elements through parametric modification and can compose motion sequences by combining the poses, gaits, turns, jumps and transitions that make up the motion repertoire. The motion elements and sequences created in Motion Studio can be used and retargeted to characters using a4B or the Motion Studio import add-on.
AI Interface	This option is not currently available.

CAPABILITIES SUMMARY CONT'D

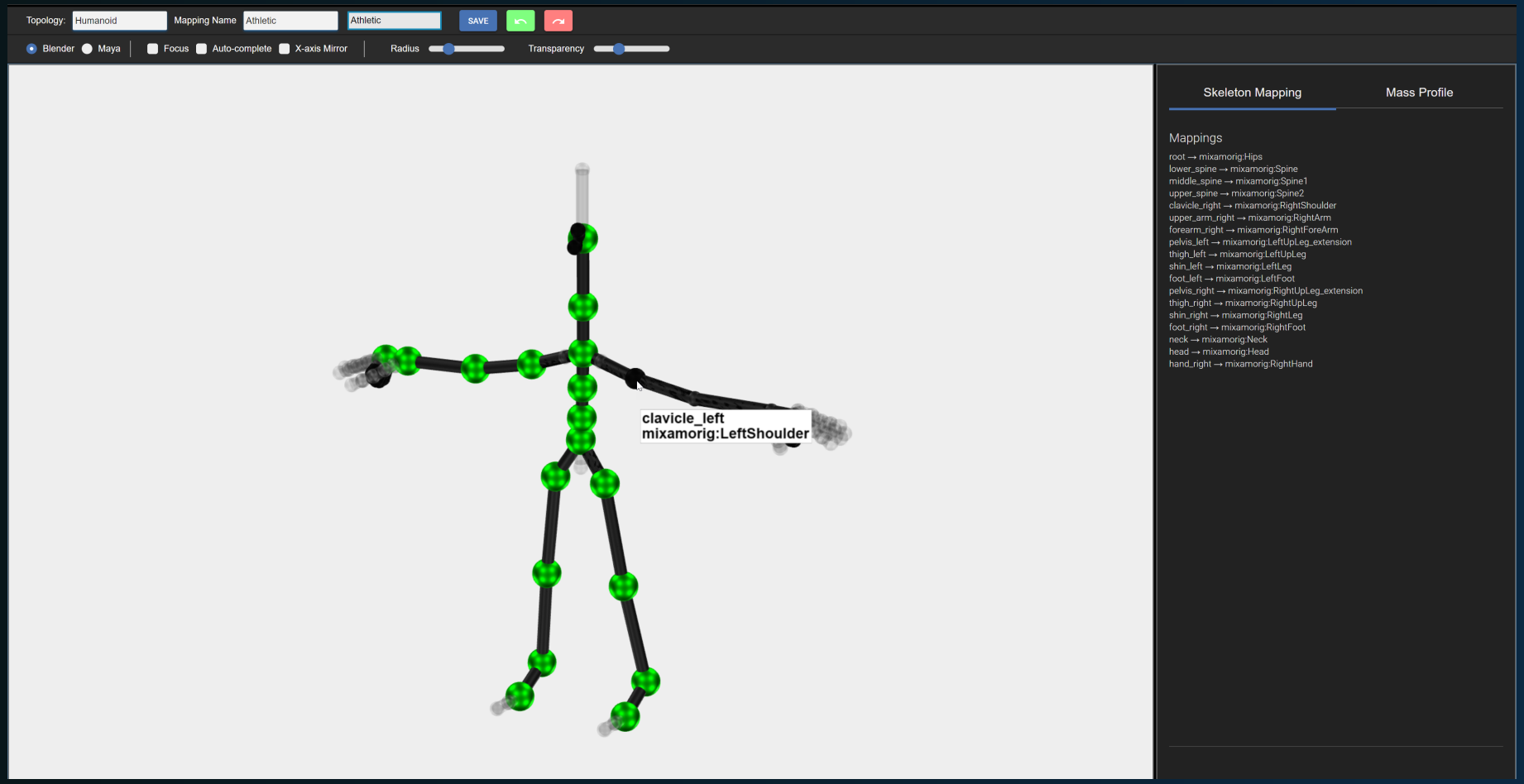
Append Cycle/Pose	The pose data for a selected pose or cycle can be generated and appended to the existing pose data for the armature starting at a chosen frame. By default, a4b provides a growing list of options for poses and cycles.
Append Cycle Transition	Transitions are useful when a character goes from one pose or cycle to another cycle. A standing character going from a TPose to a HighSpeedRun can't be posing on frame one and the running in frame 2. Similarly, a walking character can't be walking at frame 112 and then running at frame 113. Transitions provide physics-based realistic pose data that move the character from one motion to the next. For the animator, this is quite simple to use, simply specify the starting cycle or pose and provide the target pose or cycle. a4b will do the rest; whether it is a character transitioning from a pose to a run or a running character slowing to walk, the required pose data will be generated.
Modify Walk Step	The listed motions on the right may not be sufficient to meet specific animation needs such as stepping up or down or shortening or lengthening a stride. This action makes it simple to have the character do things such climbing up or down stairs or changing their stride. Starting from a chosen frame, fill in a few parameters and a4b will send the request to have Xarkin generate the required pose data. Once generated, once applied, this pose data will replace some of the previous frames as required.
Modify Run Step	Just as existing walk cycle data requires modification to step or step down, running cycles require similar modifications in order to leap over objects or make other changes to the stride. As with the previous action, a few parameters are all that required.
Turn	This action provides the animator with control over changes in a character's direction. As with the two above actions, a few parameters indicating where the turn should start and end are enough for Xarkin to generate the required pose data.



CHARACTER MAPPING & MASS PROFILE

With an armature selected, clicking Create Mapping will launch the mapping application in your browser. The mapping section on the left is used to match the skeleton to the motion model. Looking at the Skeleton Mapping on the right we can see that a number of mappings have been created. Xarkin's web site has a video demonstration of how this mapping can be performed.

The image below shows the mapping application. In the toolbar, we can see that the topology for this skeleton is humanoid. This is an armature for a Mixamo™ character. The mapping application has automatically made the connections between the your



CHARACTER MAPPING CONT'D

character's armature and the armature for the Xarkin motion model. The character armature is shown as partially transparent. The degree of transparency can be controlled by the slider on the toolbar. The armature for the Xarkin motion model is shown in black and the radius of the segments and joints that make up the armature can be controlled through the radiud slider on the toolbar.

For the purposes of illustration, some of the connections have been broken. in this image, the mouse has been used to position the clavicle_left joint to align with the mixamorig:LeftShoulder joint. Clicking when the are aligned will create the mapping link and this new connection will show in the Skeleton Mapping on the right and as a green sphere on the skeleton.

In the toolbar, the mouse controls are set to be similar to Blender mouse settings. The basics for manipulation are as follows:

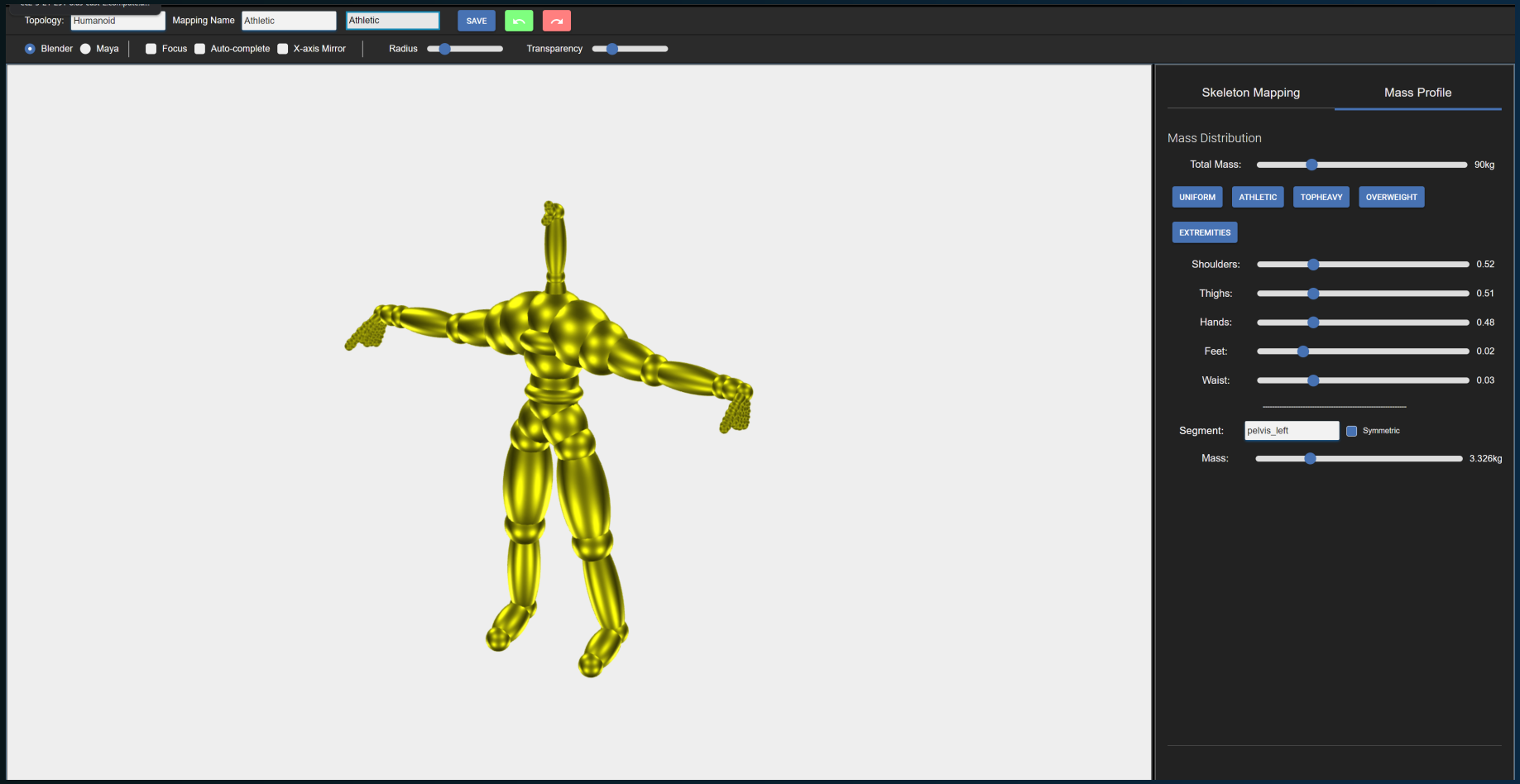
Rotate	Press and hold the scroll wheel to rotate the character.
Pan	Press and hold the Shift button and the scroll wheel to pan the character.
Zoom	Rotate the scroll wheel to zoom in and out. On the character.
Move joint	Position to the joint and then press the left mouse button and drag the joint to its counterpart on your skeleton. When the button press is released, the joint will turn green if they are properly aligned.

There are a few things that make the process of creating the mapping simpler.

- The mapping must be done in the heirarchical sequence of the model and armature. As can be seen in Skeleton Mapping, the first link established was root → mixamorig:Hips. This is the starting point for mapping the skeleton. From this joint, you can move sequentially through each joint to compose the mapping
- Selecting Auto-complete in the toolbar will automatically connect joints when possible. This will speed things up substantially; particularly if you choose to map each individual finger.
- Selecting X-axis mirror will automatically match the setting on one side with the other. So, for example, if the left clavicle were set, the right clavicle would automatically be set.
- Focus on the toolbar can be particularly useful when working in close on fine details; such as when working on the hands. When Focus is selected, as each item is clicked to select, this item will be centered on the stage and will act as the point of rotation.

MASS PROFILE

Selecting Mass Profile on the right will provide a mass profile image on the left and the controls for setting the mass profile on the right. These controls allow the animator to set a Total Mass and then set the distribution of this mass by choosing a preset such as Athletic and/or using the sliders to adjust the distribution. As this is performed, the character will show the changes on the left. As well, the mass of individual segments can be set as well. This can be perform either symmetrically or asymmetrically.



CHARACTER MAPPING & MASS PROFILE

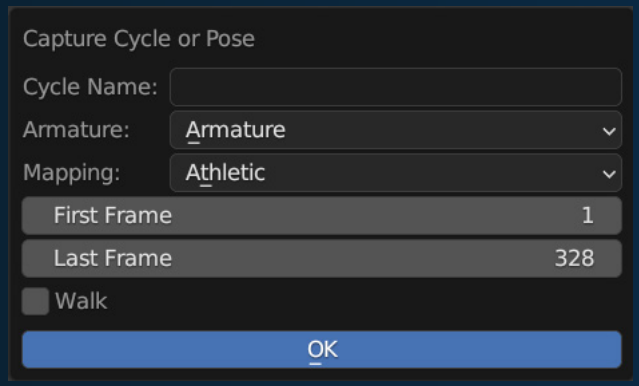
In the toolbar, the Mapping Name shows two fields.

- The first allows for selecting a particular mapping and mass profile.
- The second is a text field for naming the mapping and mass profile once it is completed. Simply provide a name and click Save.

Once saved, your new mapping profile can be used in Blender when generating motion. The format for this mapping will be *accountname:savedmapname*.

CAPTURE CYCLE OR POSE

a4b provides an action for capturing pose data. There are a few inputs here that are required.



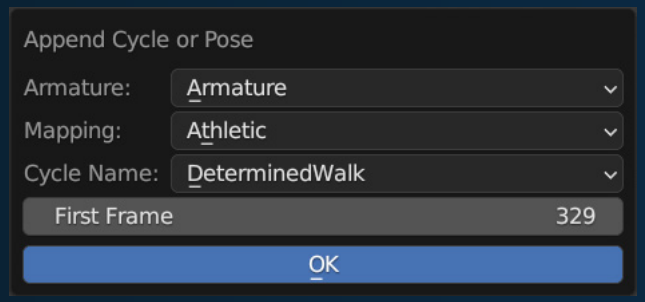
Cycle or Pose Name	This is the name for the captured cycle. Once saved, it will be used when appending the cycle in the future. The cycle or pose will be added to the list with your account name as a prefix.
Armature	By default, it will be the name of whatever armature is currently selected. However, you can override this default by selecting another armature.
Mapping	This will be the mapping that should be applied for the character.
First and Last Frames	This provides the frames that will be used for capture.
Walk	This is a selection that lets Xarkin know what to expect and to process when processing the frames provided.

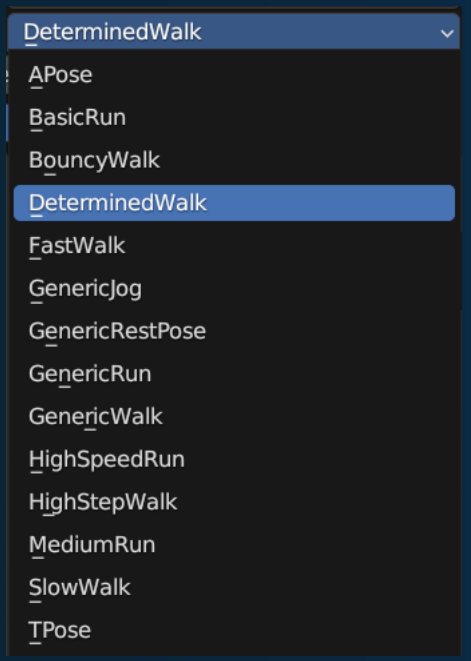
A key consideration and understanding when asking a4b to capture a cycle or pose, is the quality of the information that a4b is provided. The cycles provided by Xarkin have all been developed and tested by Xarkin for key things such as accuracy and surface contact. When a cycle is captured, if the surface contact is less than perfect, then the resultant captured cycle would be the same.

APPEND CYCLE OR POSE

Appending a cycle or pose can be performed with a few parameters

Armature	By default, it will be the name of whatever armature is currently selected. However, you can override this default by selecting another armature.
Mapping	This will be the mapping that should be applied for the character.
Cycle or Pose Name	The name of the cycle or pose.
First Frame	This provides the starting frame and is typically the last frame plus 1 that the current armature has.



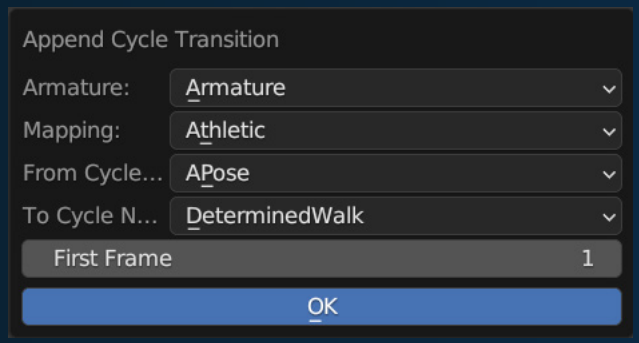


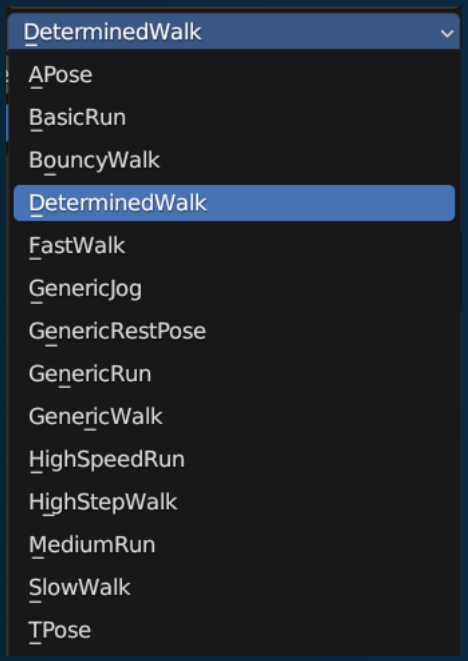
It is assumed that the animator considers the current context when choosing a cycle or pose. There are possibilities that don't make much sense. For example, adding a APose at the end of a FastWalk or HighSpeedRun. For these types of requirements, we have transitions.

APPEND CYCLE TRANSITION

Appending a cycle or pose can be performed with a few parameters

Armature	By default, it will be the name of whatever armature is currently selected. However, you can override this default by selecting another armature.
Mapping	This will be the mapping that should be applied for the character.
From Cycle...	The name of the starting cycle or pose for the transition.
To Cycle..	The name of the end cycle.
First Frame	The frame at which the transition should start.

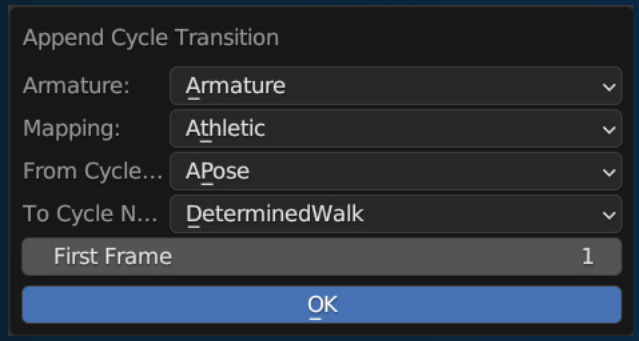


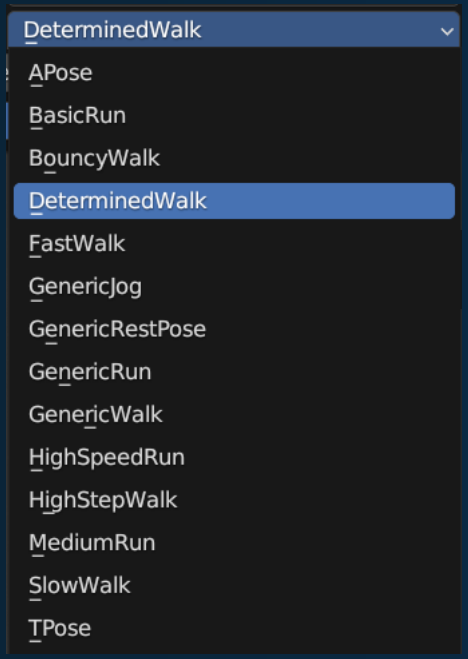


It is expected that the animator considers the current context choosing a transition. Typically, the From Cycle is either the same cycle that ends at the First Frame or something highly similar. If the animator were starting with a posed character then they would typically make this the From Cycle. From this, the To Cycle could be any sort of walk or run.

MODIFY WALK STEP

In order to perform actions such as stepping up or down and lengthening or shortening a stride, the modify walk step is provided.



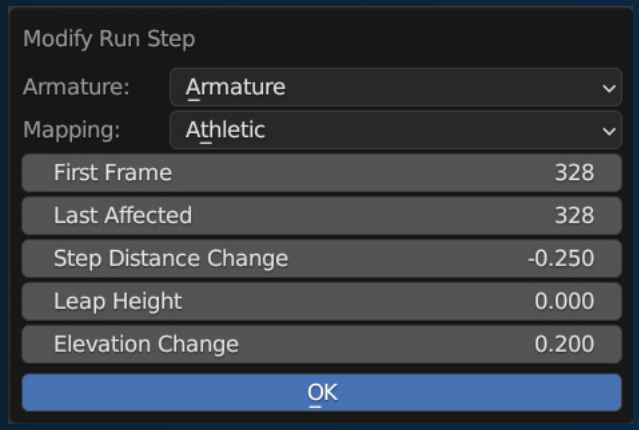


Armature	By default, it will be the name of whatever armature is currently selected. However, you can override this default by selecting another armature.
Mapping	This will be the mapping that should be applied for the character.
First Frame	The frame at which this should start. Best practice is to scrub the timeline to position the ankle of the foot being adjusted so that it is directly inline with the ankle of the other foot. However, the arc that the foot travels differs if you add or subtract a few frames from this number, so a little experimentation may deliver the result you are after.
Last Affected	This is the frame of the last affected frame. This is not the same thing as the frame where the foot being affected lands. That is determined by the other parameters and the frames being replaced by the new motion
Step Distance Change	This provided the increase or decrease in the current stride.
Elevation Change	This provides the change in elevation; positive to step up, negative to step down.
Step edge	This provides an indication as to the closeness of the edge to the rising or descending foot.

Using the Modify Walk Step, you could have a character step up on stride 2 of 5 strides and a4b will provide the pose data for all strides past the First Frame. So, First Frame could be 60 while Last Affected could be 500. Applying the change would do two things, one it would generate the pose data required to replace the existing frames with the change. Two, the last frame in the sequence is unlikely to remain 500 as the motion itself will involve more frames.

MODIFY RUN STEP

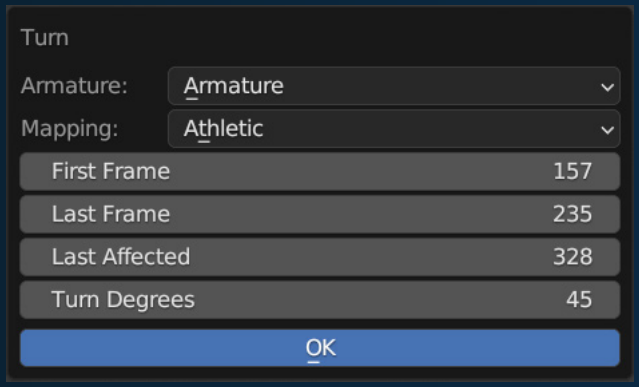
In order to perform actions such as over objects or changing the stride length, the modify run step is provided.



Armature	By default, it will be the name of whatever armature is currently selected. However, you can override this default by selecting another armature.
Mapping	This will be the mapping that should be applied for the character.
First Frame	The frame at which this should start. As with the Modify Walk Step, positioning of the first frame will affect the arc that the foot takes. As previous, the First Frame should be when the ankles line up plus or minus a few frames.
Last Affected	This is the frame of the last affected frame. This is not the same thing as the frame where the foot being affected lands. That is determined by the other parameters and the frames being replaced by the new motion
Step Distance Change	This provided the increase or decrease in the current stride.
Leap Height	This is the peak height for the leap.
Elevation Change	This is the elevation that the foot should land at.

TURN

Finally, animators will also want to turn their characters. The parameters for creating a turn are as follows:



Armature	By default, it will be the name of whatever armature is currently selected. However, you can override this default by selecting another armature.
Mapping	This will be the mapping that should be applied for the character.
First Frame	The frame at which the turn should start.
Last Frame	The frame at which the turn should end. The number of frames between the First Frame and Last Frame and the Frame Rate will determine how fast the turn takes place.
Last Affected	This is the frame of the last affected frame in the overall sequence. This is not the same thing as the Last Frame above. For example, an animator may want to turn the character 30° between frame 120 and 180 within a sequence that has 600 frame. Last Affected is 600. a4B will request the pose data be generated for all frames from First Frame on to the Last Frame Affected with the turn occuring between First Frame and Last Frame. However, the new pose data might result in there being more than 600 frames as that could be what the motion requires.
Turn Degrees	This is the number of degrees of turn that the animator wants.