

Mocap Online - Unity Animation Notes - 03/13/2019

Thanks for checking out MocapOnline.com and our large and growing library. Our Unity animations have some features worth noting. We've also included useful information on understanding and using **Avatars** correctly.

For our latest **Unity** packs, all included Animations are set to **Humanoid** by default.

The included **MotusMan_v55 character is set to use its own Avatar**, and is meant to be the **Master Avatar for all our Animations**. Therefore, **all our Animations are set to use(Copy) the "MotusMan_v55Avatar"**. (v55 is the current version, older MotusMan v2-4 will need their own Avatar.)

NOTE: Any of **Your Characters** should **not** copy the MotusManAvatar, they require their own Avatar.

***This is all explained in more detail below in the **"AVATAR"** section.

All animations are by default set with: (See Fig. 1)

"Root Transform Rotation" = Original, Bake Into Pose.

This prevents traveling or facing the wrong direction.

"Loop Time" is checked for animations meant to loop.

"Root Transform Position (Y)" = Original, Bake Into Pose needs to be set, to prevent the animation from floating in the air or underground. For example: Standing then Crouching would have the character go too low through the ground.

Reference Root Motion

All animations are included as **Root motion** and **In-Place**. There is also true **"Reference" Root motion** now in these animations.

With Unity's default of **Hips root motion**, the reference node of the skeleton is ignored and the Hips define the character's travel and facing direction. This can cause issues and animation errors since the Hips don't typically face true forward - causing straight animation loops to turn left or right, or 90 degree strafing animations to travel diagonally, etc. **This is what "Original", "Bake Into Pose", and other typical animation settings are designed to counteract and fix.**

Reference Root Motion is where the actual reference node(Root) is animated to follow directly under the character and always face correctly and consistently forward. It can be used to reliably define the character's Root Transform and ground contact.

Setting the **"Motion > Root Motion Node >" to "Root"**, (See Fig. 2) will make all of the other Animation settings disappear since the "Root" is now taking care of all Root Transform motion instead of the "Hips", negating having to set it all manually to behave correctly(as in traveling or facing the wrong direction or wrong height).

Fig. 1

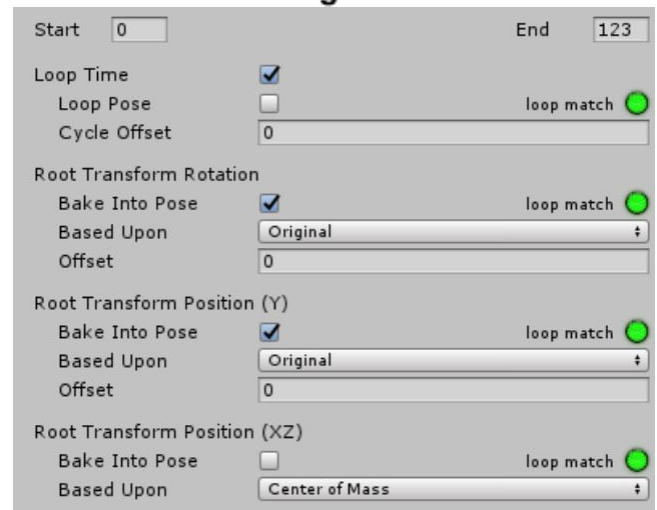
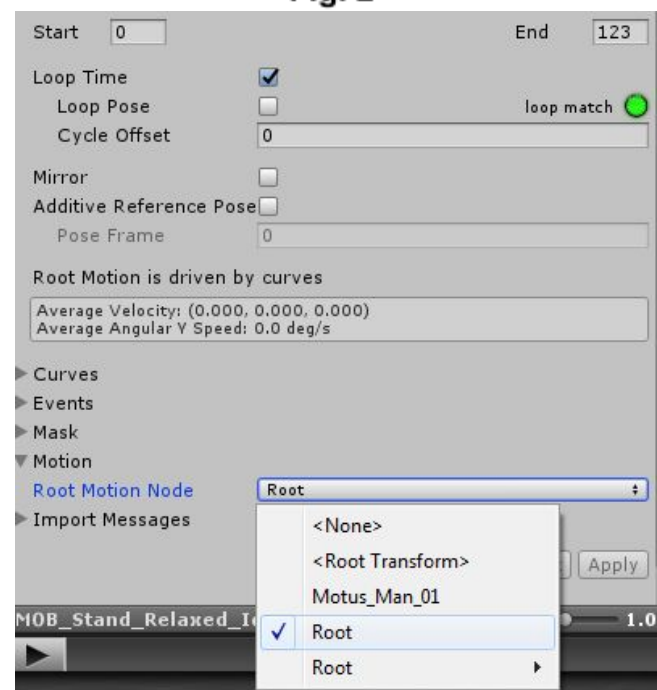


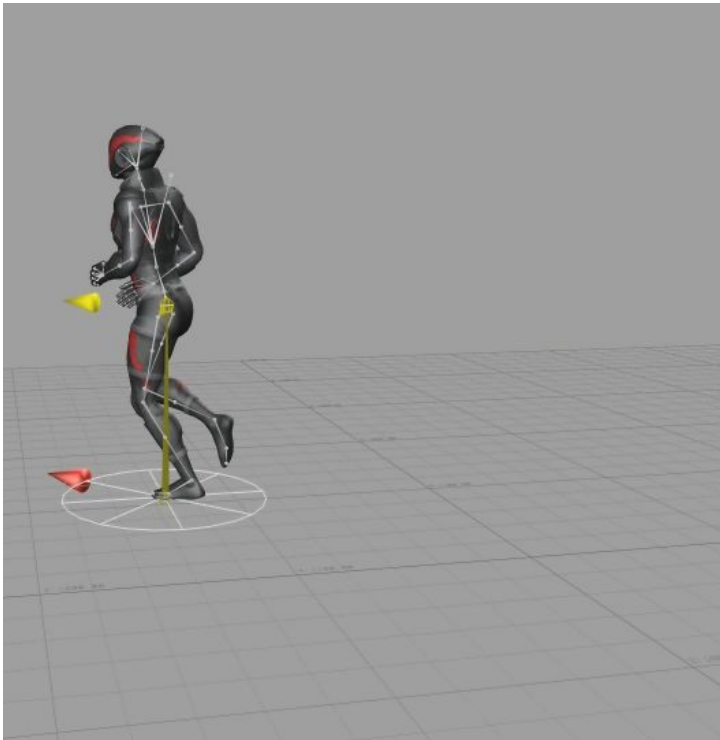
Fig. 2



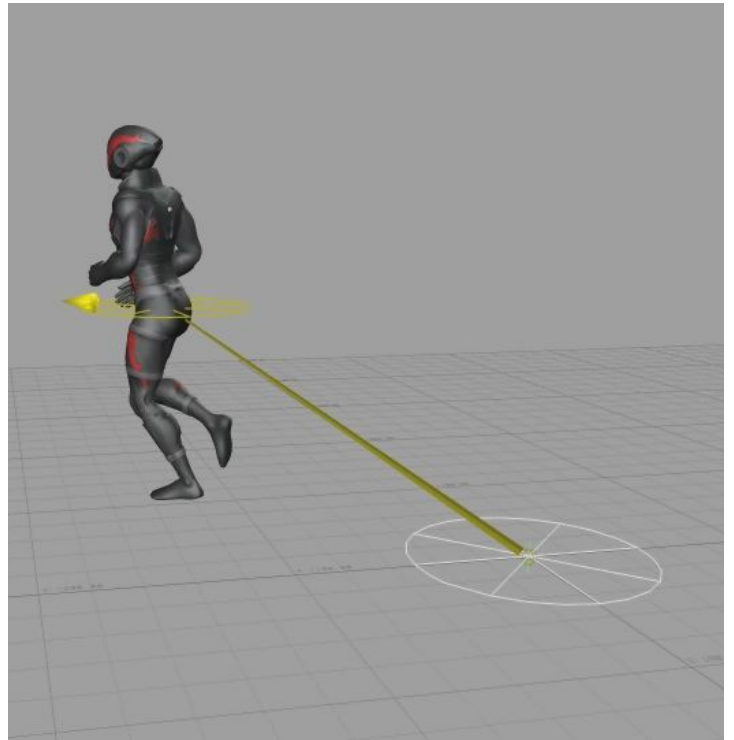
Please check out the following examples to see what the “Root” node is doing behind the scenes:

Root Motion comparison:

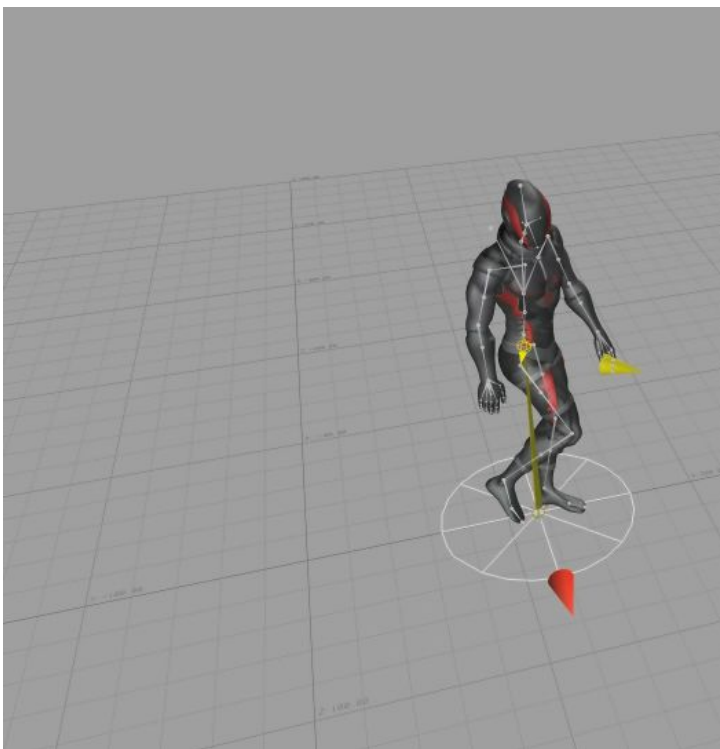
Reference Root Motion: Turn R135 Run Fwd



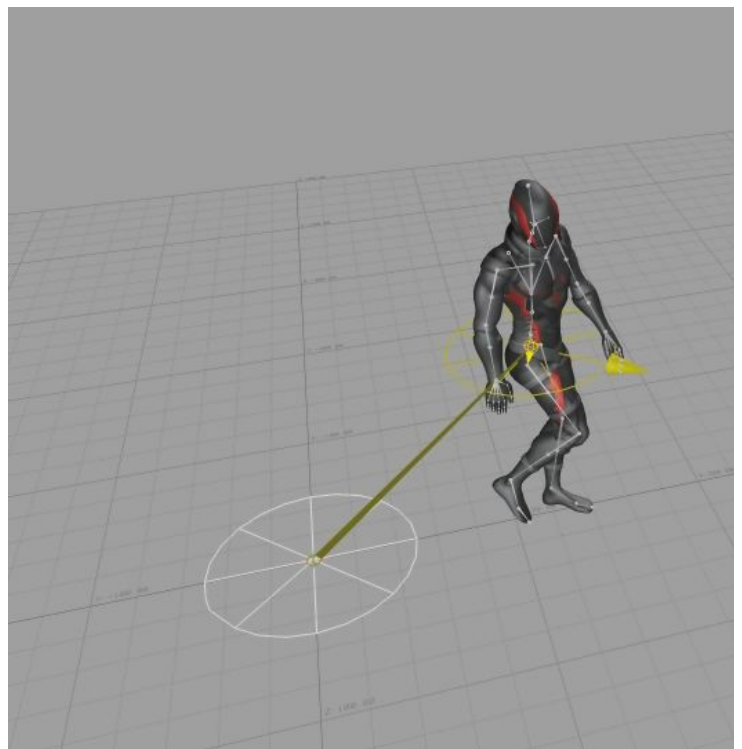
Hips Root Motion: Turn R135 Run Fwd



Reference Root Motion: Walk Strafe 90 Left



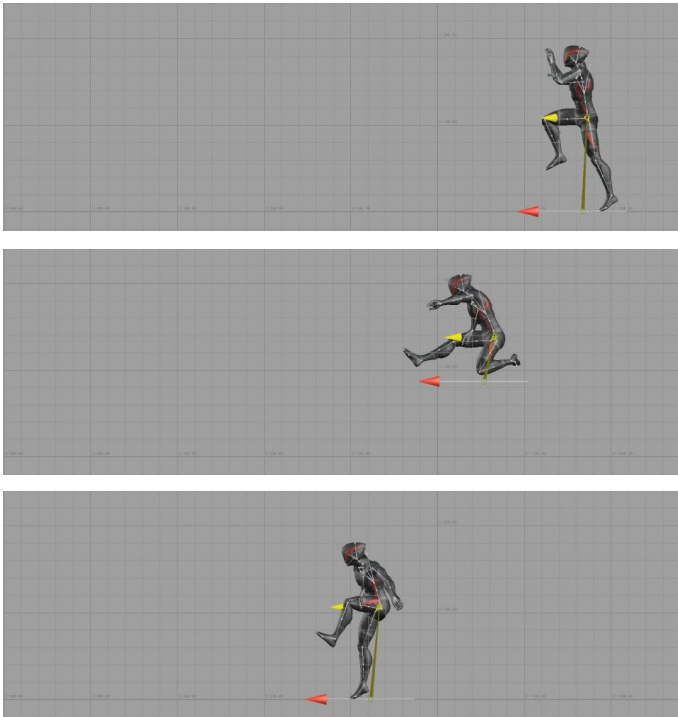
Hips Root Motion: Walk Strafe 90 Left



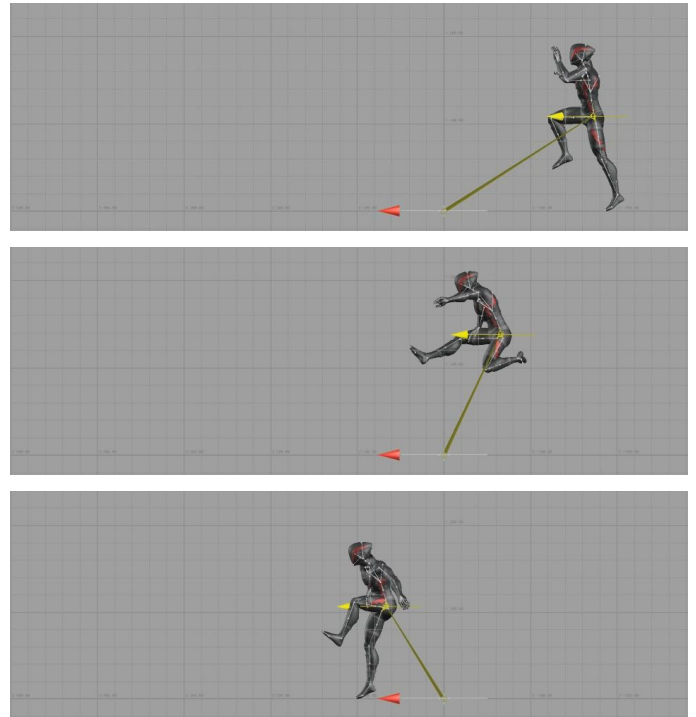
JUMPING

The Reference Root also defines ground contact as it follows vertically under the bottom of the feet.

Reference Root Motion: Sprint Jump



Hips Root Motion: Sprint Jump



In actual motion you can see the **Hips directional arrow** bounce around a lot during movement, whereas the **Root directional arrow** is smooth by comparison, but hopefully the images get the concept across.

Reference Root motion will look virtually the same as regular **Hips Root motion** and generally integrate exactly the same with other animations not using Reference Root motion. But it will have its own advantages and idiosyncrasies.

NOTE: The animations do not come set to “Root” by default, as most folks are not familiar with this function and feature. We encourage you to try it out and experiment, see what it can do for you.

AVATARS: IMPORTANT THINGS TO UNDERSTAND

The **Avatar** system retargets(copies) motion from any Avatar(source) to another Avatar(target); **MotusMan** to your **Character** in this case. But it is important to understand how Avatars work.

Characters with different Skeletons need a different unique Avatar, since there is not a perfect match. Therefore, **MotusMan(source)** and your **Character(target)** need their own separate **Avatars**.

All of our animations have the same MotusMan Skeleton, and are able to use(copy) the MotusMan Avatar as their Source.

So all our animations by default are set to Copy the MotusMan Avatar, and for a good reason. This is so **adjustments to MotusManAvatar affect all Animations**, versus adjusting potentially hundreds of Animations Avatars individually.

Why make Avatar Adjustments? Please keep reading.

AVATAR ADJUSTMENTS

Different **Characters** and **Skeletons** may have different **Stances** and **T Poses**. This can cause some unwanted pose differences between Avatars during animation, such as arms too far out or in, and same thing for shoulders, foot placement, etc. Fingers can also be adjusted and corrected.

Go into your Character's "**Rig > Configure >**" and in the **Scene Viewport** you can select bones and rotate them to an adjusted position to compensate for the stance and pose difference during animation. Be sure to click "Done" when you are finished. It may take a little trial and error but should pay off with a better looking retarget between Avatars. We suggest you experiment.

IMPORTANT : After adjusting MotusManAvatar you will need to select all Animations (multi-selection works) and "Update/Apply" their Rig(Avatar) for them to accept the changes.

AVATAR ADJUSTMENTS IN DETAIL

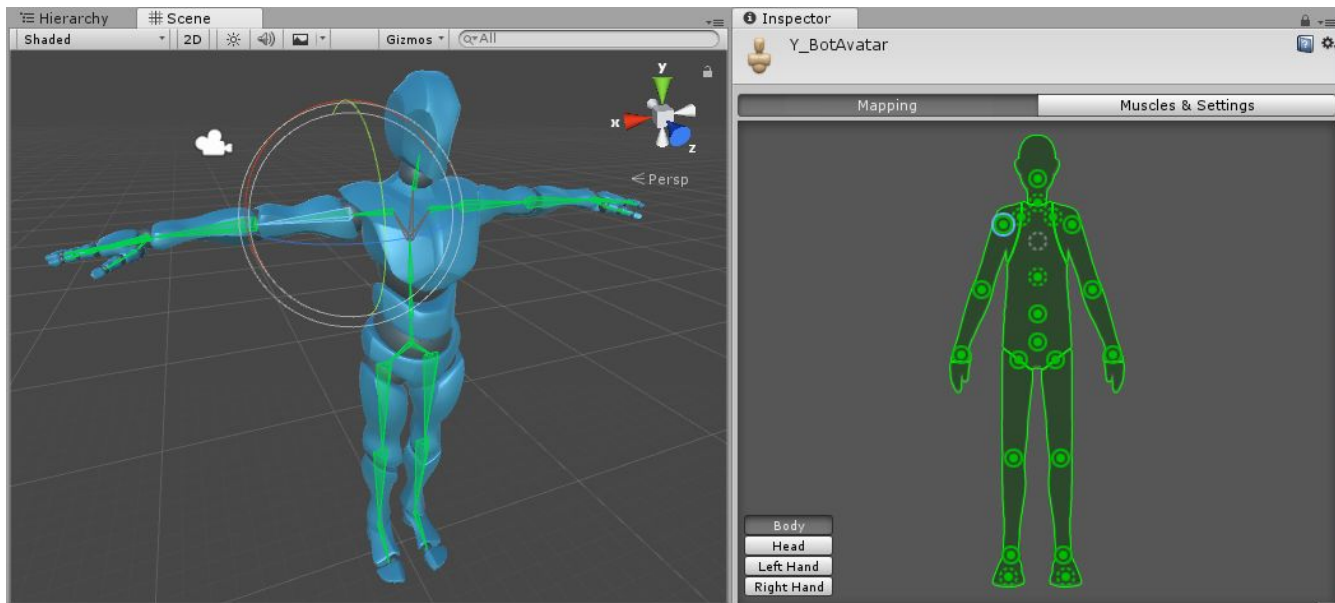
Unity will typically force your character into a T-Pose when it makes its Avatar so export pose is not that critical. You need to look at your character's Avatar and see that it is in a true T-Pose. If it's not, there is an Enforce T Pose button to help get you there, or do it manually.

But with Humanoid that is not enough at times, since seemingly matching T Poses typically do not retarget perfectly. That is why some minor Avatar adjustments are sometimes needed.

NOTE: It may make more sense to adjust the MotusMan Avatar(Source) instead of your Character's Avatar(Target). Here is why:

If Mocap Online MotusMan animations are the only ones you will use(only brand/source) then you can adjust your character's Avatar(target) to fix the arms and legs, etc. However, if you plan to use other sources/skeletons of animation as well, then you should likely do the adjustments on MotusMan(source) since another source skeleton will make your character do something different and need different adjustments. **MotusMan(source) and OtherSkeleton(source) will each have different adjustments to make their own associated animations look best on your Character(target).**

Let's start by talking about **adjusting your Character's Avatar(target)** first.



“Y_Bot” image courtesy of “OOTII - Third Person Motion Controller”

TO ADJUST YOUR TARGET AVATAR

Go into your **Character's Avatar**(target) “**Rig > Configure >**”, and in the **Scene Viewport** select bones and rotate them to adjust the shoulders, arms, legs, fingers etc. to offset the bad results you are seeing. If the shoulders are down and/or back then rotate them up and /or forward. You may want to keep the arms parallel to the ground in a T, or you may find they need to rotate up a little as well. This is totally trial and error using best guesses till you like the results. Whatever you see wrong rotate those parts in a direction to compensate, that includes legs for feet being too close together or apart, and even fingers if they look wrong.

NOTE: To get the results you are looking for, you may see bones turn red and get warnings **"not in T Pose"**. You can ignore them, it will still work fine and save(Done) your changes, the bottom line is the results you are getting on your character when retargeting.

TO ADJUST “MOTUSMAN” SOURCE AVATAR

If you decide to adjust the **MotusMan Avatar**(source) “**Rig > Configure >**”, - then all adjustments tend to be REVERSED. This is a rule of thumb, not always true but mostly. To make the Target shoulders go up, the Source shoulders need to rotate down. For arms to move out/up, MotusMan arms need to rotate down/in. Everything is backwards, and you may end up with an awkward looking MotusMan Avatar, but if it works it works. Bottom line, it typically takes some trial and error to get the best retarget look you want. Sorry if it is a bit confusing, this how Unity designed it, and it has its limitations. It could use improvement.

IMPORTANT : After adjusting **MotusManAvatar** you will need to select all **Animations** (multi-selection works) and **"Update/Apply"** their **Rig(Avatar)** for them to accept the changes.

SUPPORT:

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