R1Tools VR animation tool documentation

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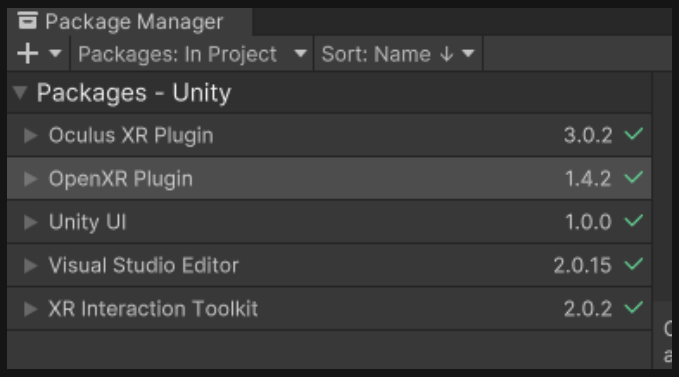
1.1 - Introduction

R1Tools VR Animation toolkit is a set of integrations to record motion capture using OpenXR with Vive Trackers within the game engine to record character animation directly in your scenes.

R1Tools uses Mecanim for basic IK in Unity but if you own FinalIK VRIK you can use the VRIK Integration for improved IK customisation!

2 - Setup + Getting Started

2.1 - Prerequisites



1. XR Plugin Management Package 4.2.1 or higher
2. OpenXR Plugin Package 1.3.1 or higher
3. XR Interaction Toolkit Package 2.0.2 or higher
4. VR Headset + 2x VR Controllers + 3x Vive Trackers
5. Steam + SteamVR installed

6. SteamVR should be your default OpenXR Runtime
7. Edit > Project Settings > XR Plug-In Management > Tick OpenXR Plugin
8. Set Steam as Default OpenXR runtime in SteamVR Settings
9. Ensure your Vive Trackers are set up with the appropriate body parts in SteamVR > Devices > Manage Trackers

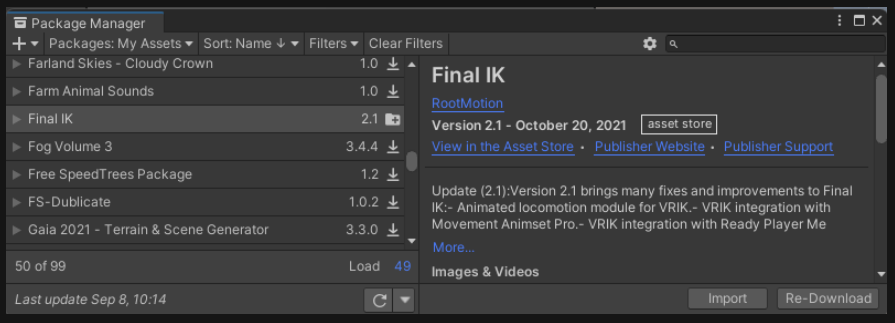
If you ever update a package and find errors appearing about it, roll back to the minimum required versions listed above

2.2 - Setup - VRIK/Mecanim

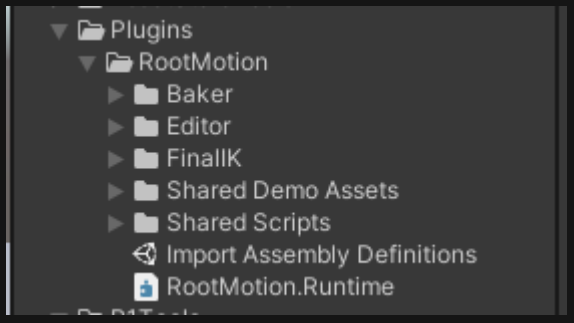
By default, R1Tools uses Mecanim to animate the character, the minimum requirements are Headset + 2 Controllers + 3 Vive Trackers (1 for Waist and 1 for each foot). If you own FinalIK with VRIK, you can use VRIK's IK system which reduces the tracker requirements to 0 as VRIK will handle foot placement automatically, as well as more advanced customisation than Mecanim.

<u>You can use Assets\R1Tools\Scenes\BasicExample scene as a reference for a working setup</u>

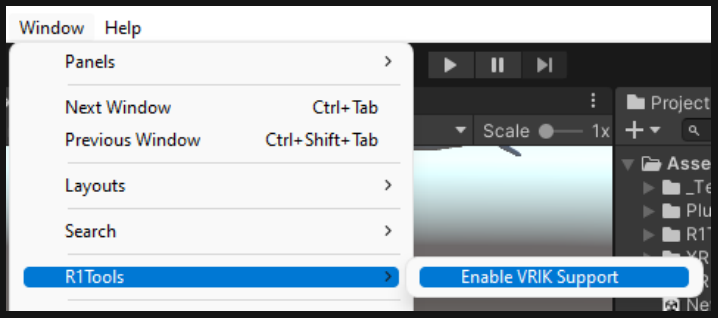
1. Make sure you have imported the prerequisites from Section 2.1
2. Make sure you have imported Final IK package which includes VRIK - You can do this using Window > Package Manager > My Assets (on the top left) and download + import from there



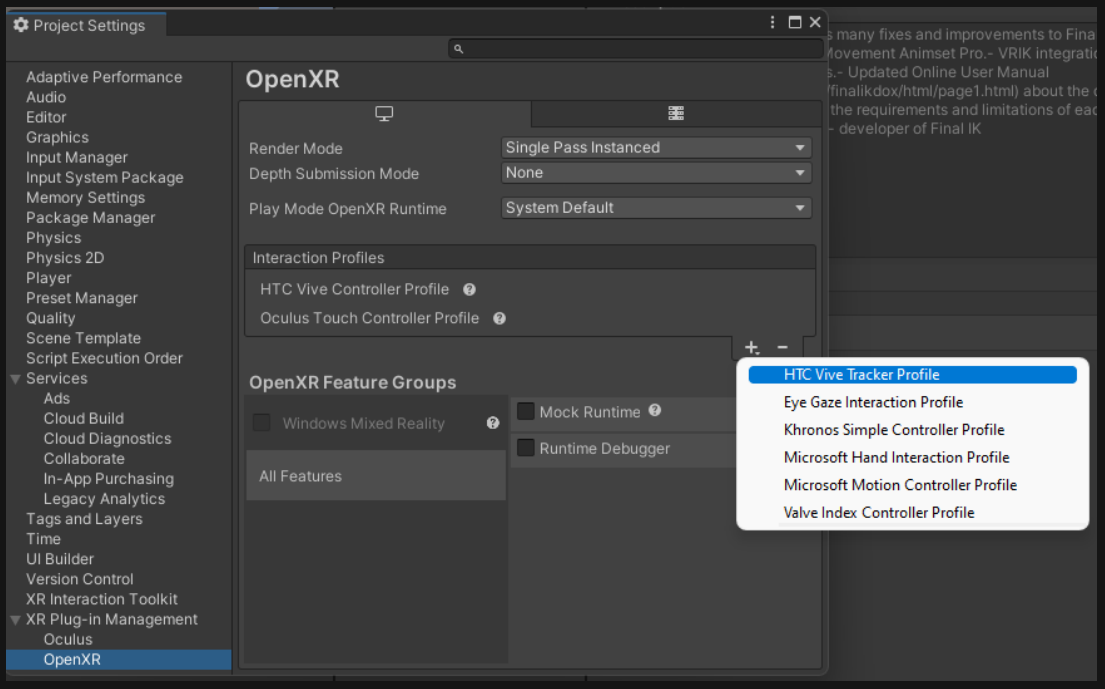
3. Once you have imported FinalIK, use Plugins >RootMotion > Import Assembly Definitions (double click this in Unity Project window and click import in the popup window)



4. Import the R1Tools package from the Asset Store
5. If there are no errors in the Console window, R1Tools should be imported, use Window > R1Tools > Enable VRIK to enable/disable VRIK support in the project



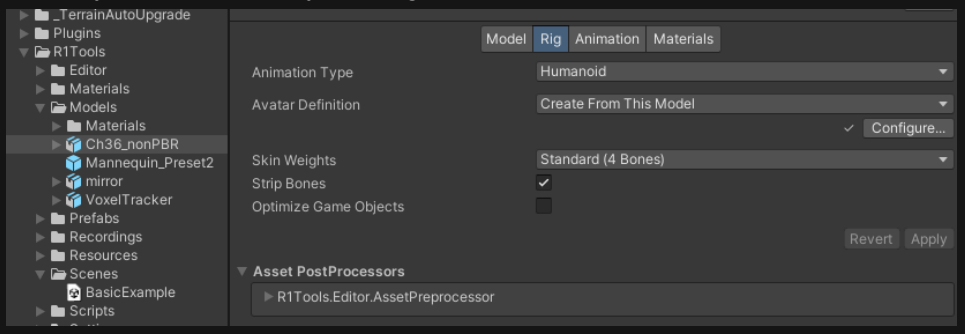
6. Edit > Project Settings > XR Plug-In Management and make sure that OpenXR is your active runtime for Desktop/PC runtime (no other plugins ticked)
7. Edit > Project Settings > XR Plug-In Management > OpenXR > Interaction Profiles > add HTC Vive Tracker Profile and HTC Vive Controller profiles



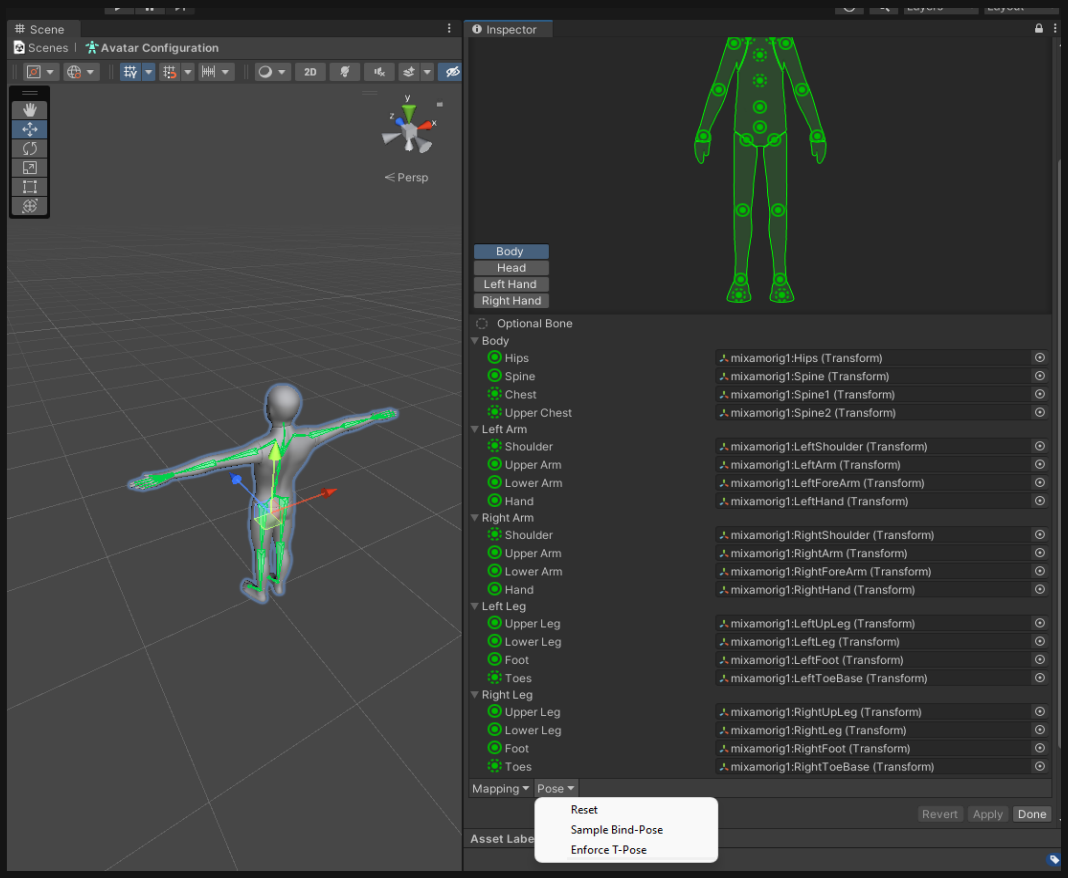
8. Open SteamVR > Settings > Enable Advanced > Developer > Switch OpenXR runtime to SteamVR.

2.3 - Avatar Setup

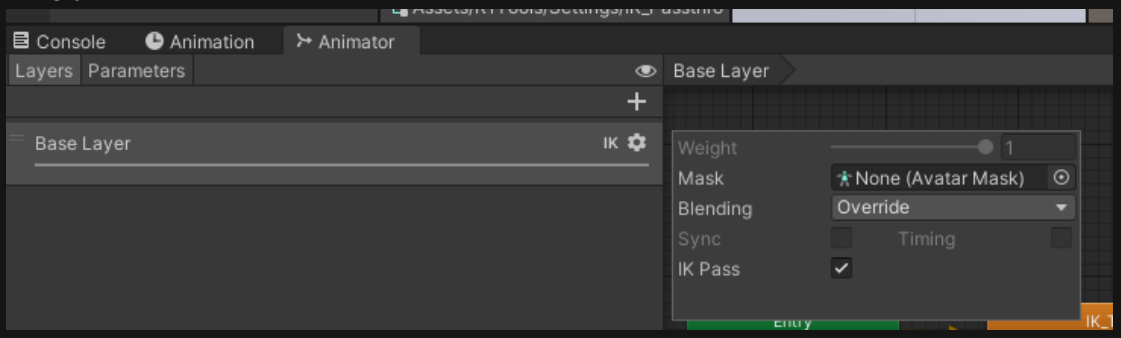
1. Import your character by placing it in the Assets folder



2. Ensure the character has a Humanoid rig in import settings under ‘Rig‘

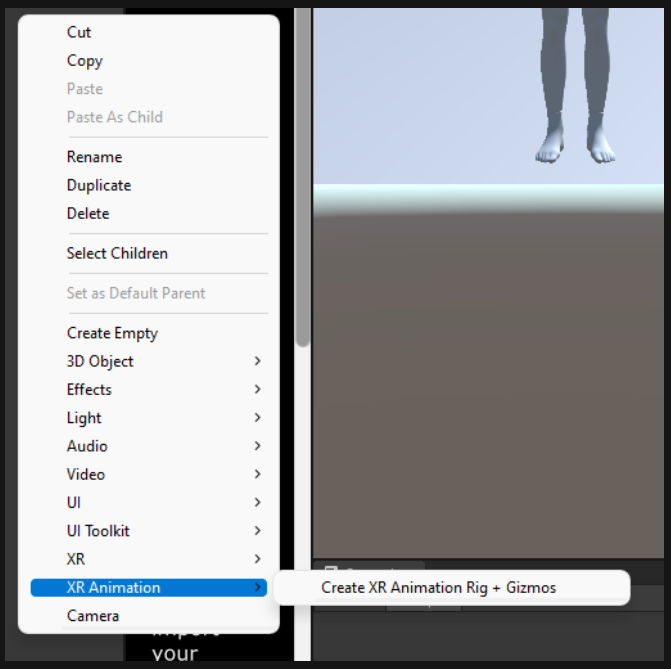


3. Ensure that the avatar definition is complete (click Avatar Definition - Config), if needed, scroll to the bottom of the inspector and use Mapping - Automap and Pose - Enforce T-Pose
4. Drag your character into the scene

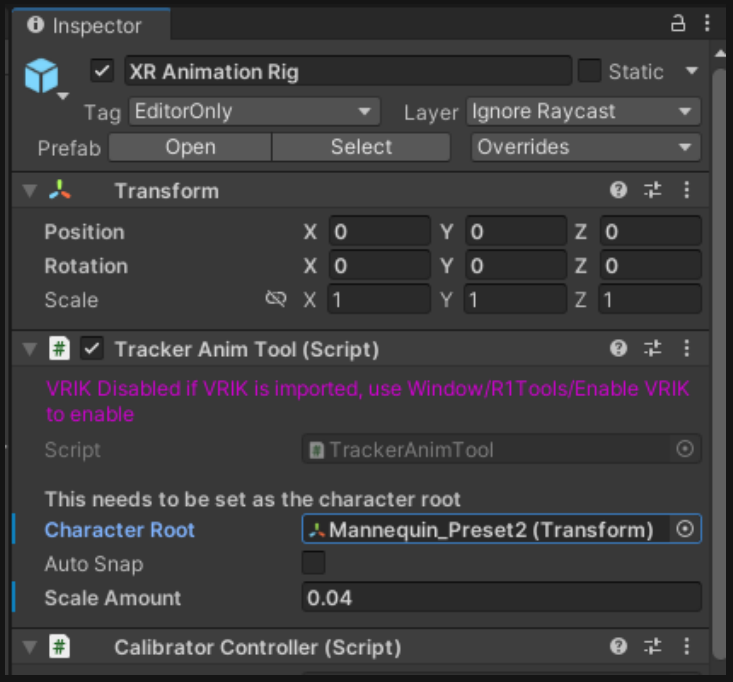


5. On the Character’s Animator component (if one is missing, please add one), make sure the Animation Controller assigned (again if missing, create and add one), make sure that Layers > Base Layer > Cogwheel IK Pass is ticked if you are using Mecanim and not VRIK. There is an example Animation controller set up for this in Assets\R1Tools\Settings\IK_Passthrough_Controller
6. If you are using Mecanim then add a Hierarchy Recorder Component to your character
   If you are using VRIK then add a Humanoid Baker (From FinalIK VRIK) Component to your character and set the ‘Mode’ on the Humanoid Baker to Realtime

7. Remove any existing Main Camera/Camera in the scene



8. Right click Hierarchy window > XR Animation > Create XR Animation Rig + Gizmos



9. On XR Animation Rig, drag + drop the root of your character (the top level with the Animator component) to the ‘Character Root’ slot on XR Animation Rig > Tracker Anim Tool

10. You can now hit play and snap into your character!

If you need to adjust the position of the character rig vs your devices, each Tracker and Controller in the XR Rig has an Offset gameobject for this

Optional VRIK setup:

1. Follow the steps above then add a VRIK component to your character
2. On XR Animation Rig, drag + drop the root of your character (the top level with the Animator component) to the ‘Character Root’ slot on XR Animation Rig > Tracker Anim Tool

3 - Plugin Features

3.1 - Recording Animation

3.1.1 - Character Animation:
By default, the plugin uses Hierarchy Recorder with Mecanim, if you are using VRIK then the plugin will use FinalIK’s Humanoid Baker to record animation.

You can record animation in play mode by hitting the ‘Record’ cube in the default R1Tools Gizmos

Use the ‘Stop Recording’ cube to stop the recording

3.1.1 - Object Animation:
If you are using Mecanim then you can assign an additional Hierarchy Recorder component to record another Gameobject hierarchy at the same time as your character.

If you are using VRIK then you can assign a Generic Baker to the Tracker Anim Tool Component to trigger recording of generic objects at the same time as the character.

3.2 - Animation Playback

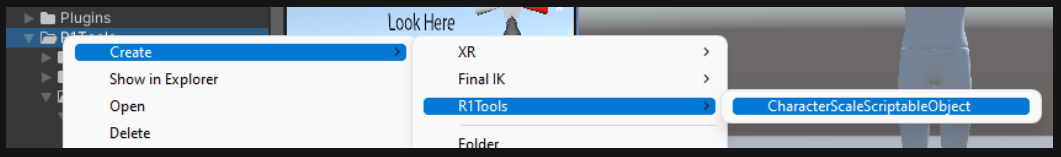
If using Mecanim:
The saved animations can be dragged/dropped onto a copy of your character but you need to remove the Avatar from the Animator component as the saved animation file is not ‘Humanoid’ - this is a limitation of Unity’s Gameobject Recorder.

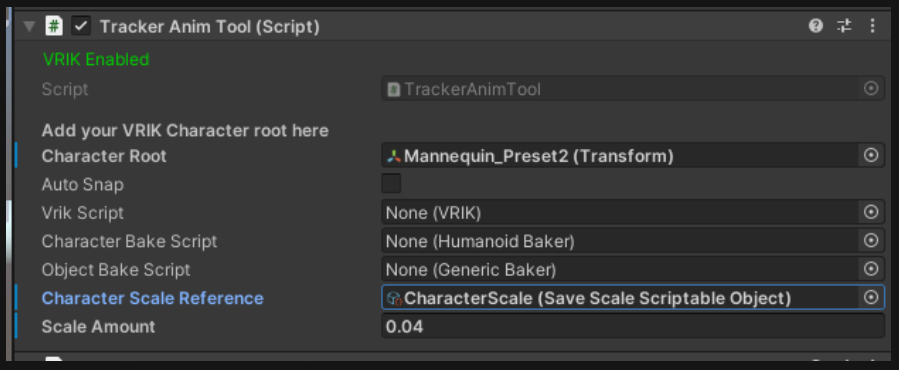
If using VRIK:
The saved animations are Humanoid animations and can be dragged/dropped onto a copy of your character like any other animation.

3.3 - Character Scale

The default R1Tools gizmos have buttons for adjusting character height and arm lengths to better match your proportions if you wish to modify the character to fit your height/arm length. The multiplier for this is the ‘Scale amount’ variable on XR Animation Rig > Tracker Anim Tool.

If using VRIK:





As character scale doesn't record in Humanoid animations with VRIK, you can assign a Character Scale Scriptable Object to the Tracker Anim Tool Component on the XR Animation Rig. This file will save once you have snapped into a character and you can refer back to it to get the scale values for the character to resize the character to match the scale it was animated at.

You can make a new Character Scale Object by right clicking in the project menu > R1Tools > CharacterScaleScriptableObject.

3.4 - Future support for HPTK Pose & Snapping

HPTK Pose & Snapping support is in the works, there are some bugs being ironed out so keep an eye on the asset store for updates!

4.1 - Using Quest/Quest 2 + Vive Trackers

To use Vive trackers with the Quest/Quest 2 over link:

1. Navigate through your Steam Install location to find the SteamVR default.vrsettings file, something like:
   C:\Program Files\Steam\steamapps\common\SteamVR\resources\settings
2. Make a backup of default.vrsettings
3. Edit default.vrsettings using any text editor and make sure the following individual settings are changed to match the below:
4. "requireHmd": false,
5. "activateMultipleDrivers": true,
6. Install OpenVR Space Calibrator > https://github.com/pushrax/OpenVR-SpaceCalibrator/releases
7. Run Steam with Steam set as OpenXR default runtime
8. Use OpenVR Space Calibrator to sync the playspaces between Oculus + OpenVR/OpenXR using OpenVR SPace Calibrator

5.0 - FAQ

- When using Mecanim, my animation files are not saved as Humanoid, how do I convert them?
  -You should be able to export the animation file and the model and import them into another 3d package such as Blender, combine the two and re-export as a model with animation which Unity will import as Humanoid animation. If you are using VRIK, VRIK already saves humanoid animation.
- Can I use XR Interaction Toolkit Locomotion/Turn providers with this?
  -I have included the components for this on the rig but the support for this is very experimental at

this stage due to XRIT changing a lot. Feel free to turn on the movement providers to use the analog sticks to move and turn at your own risk.

- Trackers aren't working / SteamVR isn't working with Unity?
  Make sure that in SteamVR is your default OpenXR runtime - Open SteamVR > Settings > Enable Advanced > Developer > Switch OpenXR runtime to SteamVR.

6.0 - Support

In the event of any unexpected issue, please contact me directly at robyer1tools@gmail.com