Main

Silvers super epic VRChat avatar guide!

Here are the tools I normally use in my project!

Simple Guides (Anyone new to Unity can do this):

Uploading an avatar that you bought? <u>Go here.</u> Want to <u>customise the avatar that you bought?</u>

Have a model that doesn't have a ready made VRC prefab? Go here

Want to add toggles and expressions? Here's the FX layer guide

Time to optimise your avatar.

Complex Guides (Requires Knowledge of Blender/or Unity):

Making a MochiFitter profile

Tools

Useful Tools for VRChat Avatar Creation

---Simple Editing—

Modular Avatar + VRCFury

https://modular-avatar.nadena.dev/

https://vrcfury.com/

Both do the same things and work well together in a unity project.

Easy to add custom clothing and tools like GoGoLoco. Both are also Non-destructive.

VRCFury also has a few tools for optimizing and making toggles!

Hai Tools

https://docs.hai-vr.dev/docs/products/listing

Very useful tools like deleting polygons without messing with the avatar (Non-Destructive) Uses Modular Avatar

VRCQuestTools

https://kurotu.github.io/VRCQuestTools/

Converts PC only avatar to Quest. (Non-Destructive)

d4rkAvatarOptimizer

https://github.com/d4rkc0d3r/d4rkAvatarOptimizer

Optimizes avatars in just 2 clicks! (Non-Destructive)

Thry's Avatar Performance Tools

https://github.com/Thryrallo/VRC-Avatar-Performance-Tools

Shows you what each part of an avatar is taking. Helpful is you have no idea where to start with optimising.

---FBX File editing---

Pumkins avatar tools

https://github.com/rurre/PumkinsAvatarTools

Cool tool for copying and pasting between avatars (original prefab to edited fbx) Mass removing old useless components and more.

(Unless you know what you're doing, never save the edited fbx to the og fbx file. YOU WILL MESS UP YOUR AVATAR!!!)

---Optional---

AvaPo!

https://helium.booth.pm/items/7249970

Makes posing in unity so much easier! Perfect for thumbnails.

KRT Material Swaps

https://github.com/kurotu/krt-material-tools

Easy material swap.

—Blender Tools—

Mio3 UV

https://extensions.blender.org/add-ons/mio3-uv/

Free useful tool for editing UV maps. Also made by the same creator of the avatars Shinra and Minase!

Mio3 Shapekeys

https://github.com/mio3io/mio3_shape_keys

Perfect for managing and creating shapekeys. Also has shapekey sets for ARKit, VRChat Visemes and MMD.

Easy Envelope

https://superhivemarket.com/products/easy-envelope

Quick way of setting up weight for hair, skirts and more. Allows you to easily adjust the envelope.

Meow Meow Export

https://github.com/Gofven/meow_meow_export

For Substance Painter. Exports your layers into a nice PSD File.

This guide and list was put together and written by SilverCherry https://silvercherry.art/

Please check out my other work!

Uploading a premade avatar

Uploading a premade avatar from booth or gumroad or any other avatar marketplace.

Make sure that before you purchase any avatar that you check the licence. Each avatar creator has their own licence that you agree to when you purchase it. If there is something you don't agree with, either find a different avatar or make your own. NEVER break the licence since it is disrespectful to the artist. Also make sure to check what performance rank your avatar will be.

Here is a guide for PC and Quest ranks:

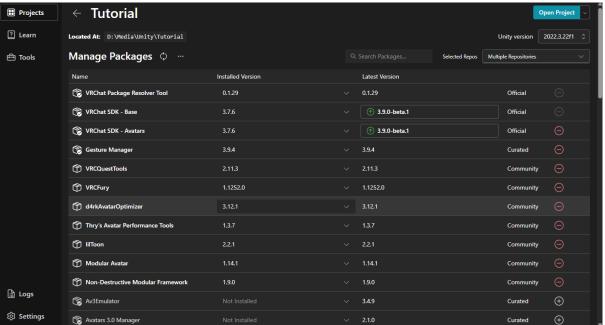
https://creators.vrchat.com/avatars/avatar-performance-ranking-system/

You should first download the VCC and follow the steps before: https://vrchat.com/home/download

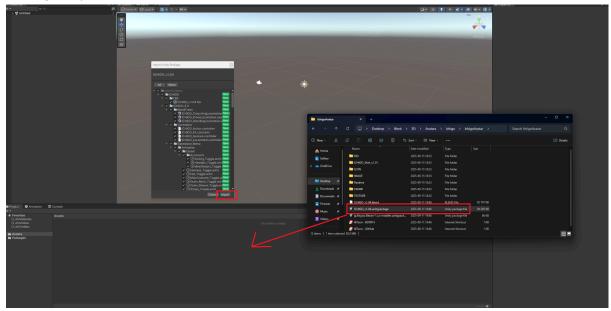
Open up the creator companion and create a new project. Before opening up the project add the required tools for the avatar you are planning to upload. I will be uploading Lichigo and she requires Liltoon and Modular avatar:

- ・シェーダー(Shader) liltoon Shader 1.10.3 https://lilxyzw.booth.pm/items/3087170
- Modular Avatar 1.13.4
 https://modular-avatar.nadena.dev/

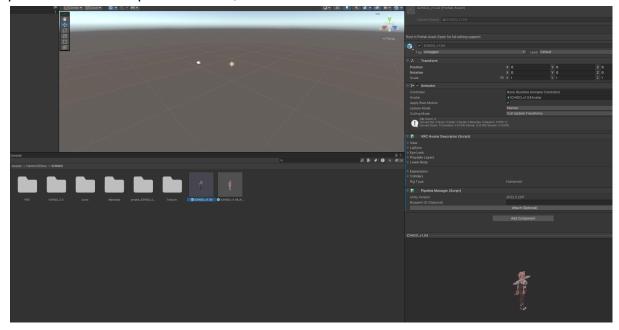
In the creator companion add the tools you need and some extra if you would like. This is what I will be adding:



Then open the project. (It might take some time) Once the project opens, drag in the unity package of your avatar into the assets folder. Press import when a window pops up.



It should have created a new folder in the assets section. Open it up and look for a prefab.Don't mix it up with the FBX, that's the raw model file.



Most booth avatars have a 'kisekae' prefab included, this is for dressing the character up and editing. Drag in whichever avatar prefab to the hierarchy(The window on the left) and your avatar should appear in the scene(the window in the middle). Now you can upload your avatar!

UPLOADING!!!

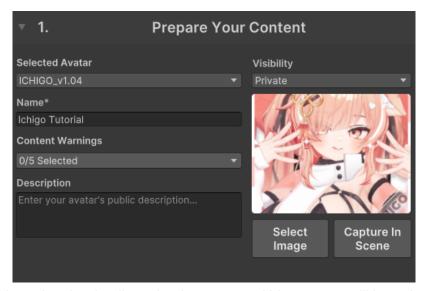
On the top left open the VRChat SDK and open 'show control panel'. Log into your VRChat account and open up the builder tab. Depending on the creator your avatar may be slightly unoptimised... If that's the case then we can do a few mouse clicks to change some of those red alerts on your avatar builder page!



Close the SDK panel and click on your avatar in the hierarchy. On the right you should have an animator, VRChat Avatar Descriptor and a pipeline manager. The animator links back to your FBX file, the descriptor contains all the expressions, custom animations, visemes and menus and the pipeline manager contains your avatar ID which is unique to all avatars and is created when uploaded.

Under all of that press 'Add Component' and search for d4rk avatar optimizer (if you don't see this go into the VCC and add the tool into your project). I like to keep it basic but you can mess around with the settings later. This tool is Non-Destructive so it will not be applied until it's in build mode so you can remove the component without messing anything up.

Open up the VRC SDK and add a name, description and thumbnail to your avatar! Visibility means if you want people to use your avatar or not. **99% of booth and gumroad avatars do NOT allow public uploads of the avatar so make sure you set it to Private!** Ichigo is an avatar that doesn't allow public uploads even if edited. However she does have a <u>sample</u> from the artist uploaded which is public.

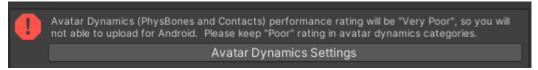


Once you finish setting the details, upload your avatar! Your avatar will be uploaded to PC and have an avatar ID, you can check this in the pipeline manager component of your avatar or the VRChat website.

Uploading to Quest

I will be using VRC Quest Tools to quickly upload my avatar for Quest. I recommend you use it too: https://kurotu.github.io/VRCQuestTools/

Once you have the tool downloaded go into tool>VRCQuestTools>Convert Avatar for Android. In the window it opens, drag your avatar from the hierarchy to the avatar slot in the window and begin converter settings. If your avatar has too many physbones you will have to remove a few. Press the 'Avatar Dynamics Settings' button:



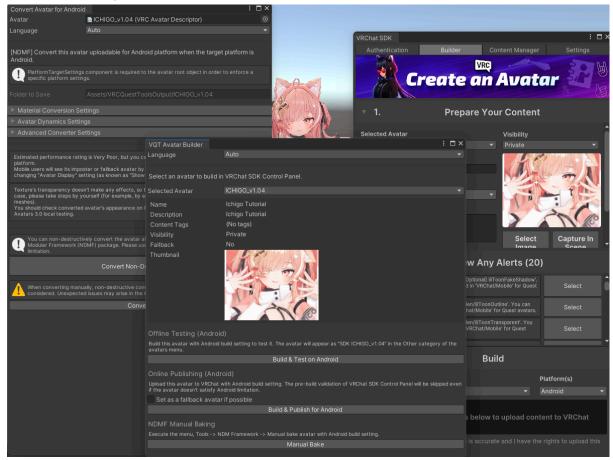
You can only have max 8 physbone components and 64 transforms. Remove the physbones that might seem unnecessary for the Quest version. When you're done apply the settings. I will be converting my avatar non-destructively. Don't press it just yet...

MAKE SURE YOU HAVE MODULAR AVATAR DOWNLOADED SO YOU CAN SEE THIS OPTION!!!! (Check tools for link)



Close the window for now and go into file>build settings and switch it to android. If you didn't download the Android version for unity you might get a download button instead. Your project will turn into an Android one.

Open up the VRCQuestTools window and VRChats SDK control panel. Click on the 'Convert Non-Destructively' button. It should have opened up a new window.



In that new window press the 'Build & Publish for Android' button. This should upload the Quest version of your avatar. Now you're ready to show off your new avatar to all your friends in VRChat!!! Yippie!!!

Just remember to switch it back to windows if updating your PC avatar.

Optional - Generating/Removing Imposters

Imposters are those weird pixelated avatars that you see when an avatar goes over very poor performance rating or when it's only uploaded to the opposite platform to what you are on. Imposters automatically generate for the latest avatars uploaded. Avatars before the imposter system might not have imposters generated automatically. You can only generate imposters on your own avatars (avatars you have uploaded). A picture of an imposter:

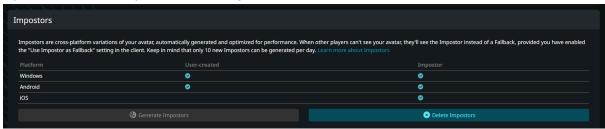


To check if your avatar has an imposter go into the VRChat Website: https://vrchat.com/home/

And press the 'Avatars' button. This should show the avatars you have uploaded. Open up the page for your avatar. The link of your avatar should contain the avatar ID at the end of it: https://vrchat.com/home/avatar/avtr-70dc45f1-75e1-4fbd-9c7b-ad3312d07747

With this ID 'avtr_70dc45f1-75e1-4fbd-9c7b-ad3312d07747' I can update my avatar, upload a quest/ios version or just upload a completely new avatar. You cannot use someone else's avatar ID.

If you scroll down of your avatars page there should be a section about imposters:



You can generate or delete your imposters. If your avatar is optimised enough and has a version for each platform you may not need to generate an imposter.

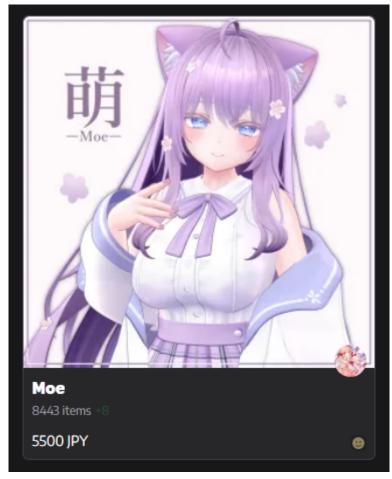
Customising your Avatar

Customising your Avatar!

Now that you have your avatar uploaded you might wanna add some new clothes or maybe change some colours. Depending on your model you might have a lot of options to choose from. Since I will be using booth avatars and assets this website contains lots of avatars and assets to choose from:

https://boothplorer.com/

It's super easy to find new clothes, textures and hairs for your avatar! I will be using Moe for this tutorial.



Currently the website has recorded 8443 items for Moe!!! If I open up the page I can find how much the avatar costs, the listing link and other avatars created by the creator. If you scroll down you can find the assets created for it and a slightly useful search bar. Try searching for 'hair' or maybe 'dress'. Super useful, right?

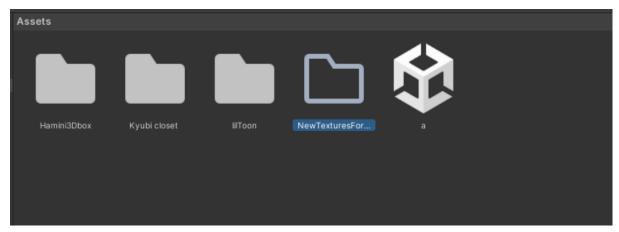
If you aren't using a booth avatar but have assets that fit your avatar this tutorial should still be helpful. If you can't figure it out then contact the creator of the asset.

I will also be showing how to do simple colour changes which will work on any avatar. If you want to change expressions or add toggles please click <u>here</u>.

Changing colour of textures

Back to unity. You should have uploaded your first avatar already. I will be using the 'kisekae' prefab of my avatar because I want to change the clothing later on but you can still use the original prefab of your avatar.

If you're using the 'kisekae' prefab, remember to drag it into the hierarchy.

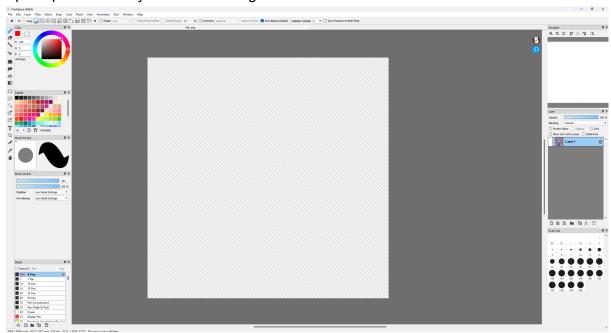


Before I do any texture changes I make a new folder in 'Assets'. I don't like overwriting the original textures in case I want to use them in the future.

If your avatar came with PSD versions of your textures you might want to use them instead of the PNG versions. The PSD version has layers which make it super easy to change the colours of. I will be using PNGs since I want to just change the hair colour.

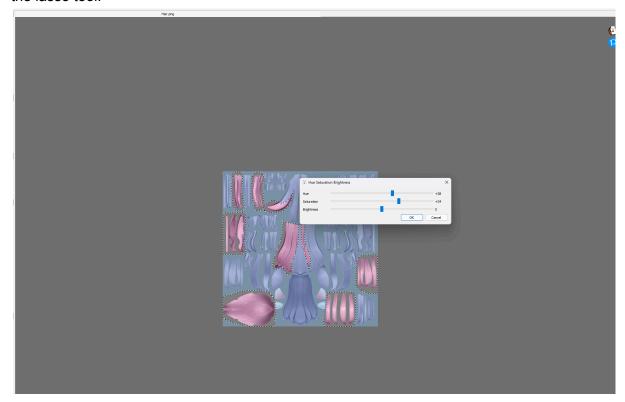
You will need a drawing software like photoshop, firealpaca, ClipStudioPaint or any other program. I will be using firealpaca.

Open up the texture you want to change. For me it will be the hair:



Imagine the hair texture.

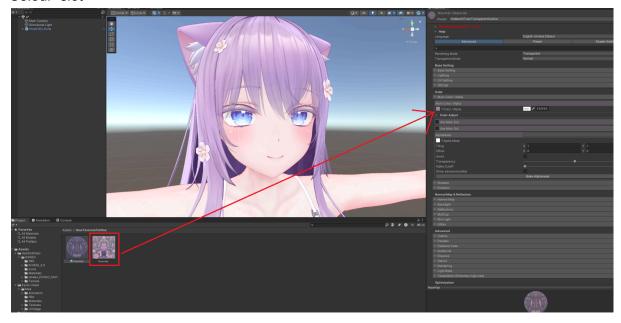
Since I'm going to just change the colour, I will select the parts that I want to change using the lasso tool:



I then change the colour of it using another layer with a blending mode or use the hue slider. Once you're done with the changes, save the new PNG into the folder we created in assets. Then look for the material for the hair. For me it was in:

Assets > Kyubi closet > Moe > Materials

Duplicate the material (ctrl-D) and drag it into the folder with the new texture. Click on the duplicated material and on the right (inspector window) you should have some options. You can mess around with these options if you would like. Drag the new texture to the 'Main Colour' slot



Once you have done that, drag the material from the project folder onto one of the meshes of your avatar. Since I'm changing the hair I will drag the material to the hair but if you're changing the clothes then you would drag it onto the clothes.

If your struggling you can use KRT Material Swaps:

https://github.com/kurotu/krt-material-tools





This might not be the best edit in VRChat but it still really changes the character. Now repeat this on other parts of the avatar if you would like!

Adding new clothes onto your avatar

I will be using this set:

https://booth.pm/en/items/5633490

But you can use any other outfit that fits your avatar. MAKE SURE YOU BUY THE ONE THAT FITS YOUR AVATAR!!!

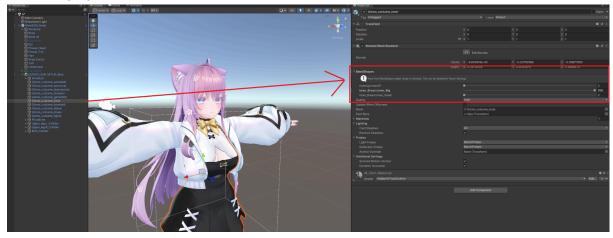
Also make sure the poly count is reasonable. If it doesn't list the poly count, contact the seller or look for something else.

For this tutorial I will be using Modular Avatar but you can use VRCFury. https://modular-avatar.nadena.dev/

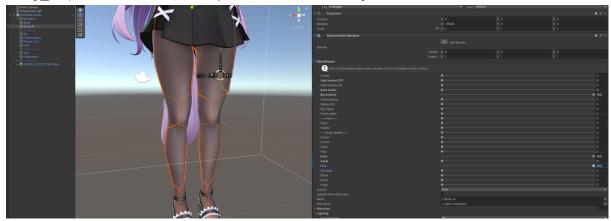
In unity look for the prefab of the clothes once you have found it drag the prefab onto your avatars in the hierarchy:



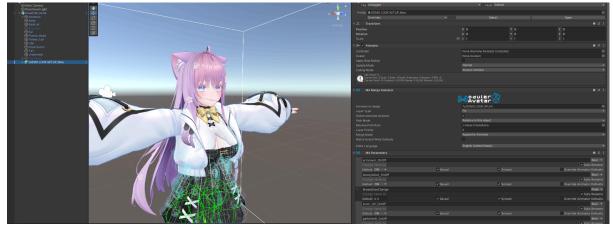
You can adjust the clothes to your avatar's body shape by clicking on the individual meshes and changing the blendshapes.



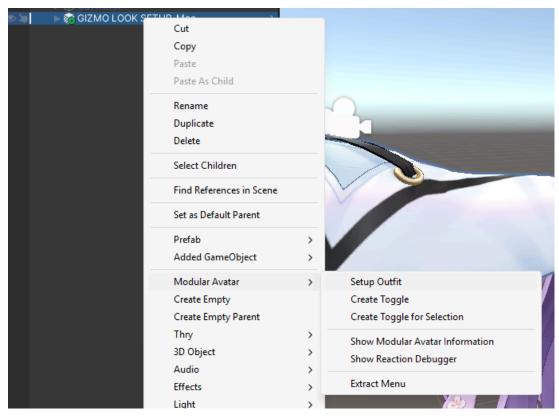
If the body is clipping into the clothes you can go into the body's mesh (Normally named 'Body_All') and use the blendshapes to 'delete' the body inside:



Open prefab from the hierarchy if your outfit has a Modular Avatar component set up then you can go straight to upload! Remember to check your avatar ID! If you want to upload a completely separate avatar go back to the 'Pipeline Manager' and detach the ID. Modular Avatar:



If you don't have modular avatar on your clothes you can right click the clothing prefab in your hierarchy and go into ModularAvatar>Set Up Outfit:



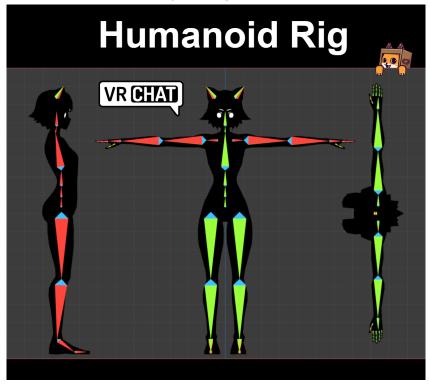
Now you can upload your avatar!

Don't forget to upload the Quest version (if you want one).

Uploading a model with no VRChat version

Uploading a model without a premade VRChat Prefab. (Blender Req**)

The first step is having a model ready for importing into unity. This guide will go into uploading a Humanoid model with this type of rig set up:



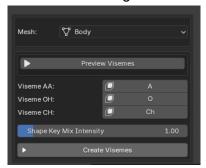
(This image was taken from the official VRChat Discord server.)

To avoid getting a yellow warning when uploading make sure to keep the upper leg and lower leg bones straight.

You will need to make shapekeys for the visemes. Using Cats Blender plugin they can generate those 15 shapekeys you just have to make A, Ch and O. Like this:



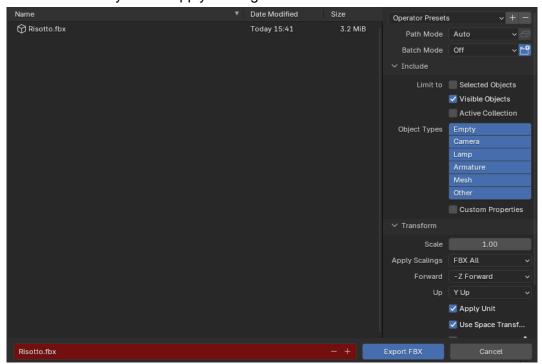
Make sure your mesh with shapekeys is called Body. When you have made these 3 shapekeys you can select them in Cats and then generate:



If you want to make them manually or just want to read more about this: https://creators.vrchat.com/avatars/animator-parameters/

Depending on your avatar you might want a blink shapekey too. Make sure both eyes close when making this shapekey. Also if you are new to Blender please check out the Blender Tools I recommend on the first page.

When you are done with setting up your rig, visemes and expressions export your model as a FBX file. Make sure you set 'Apply Scalings' to 'FBX All'

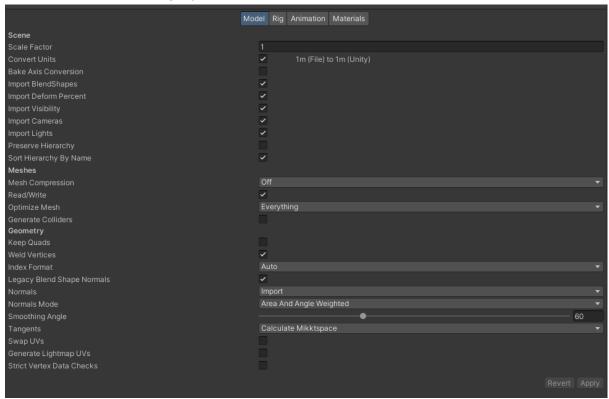


Create a new unity project using the VCC and add the shaders or whatever packages you want. I will be just using Liltoon Shader but if you want you can use Poiyomi Shader.

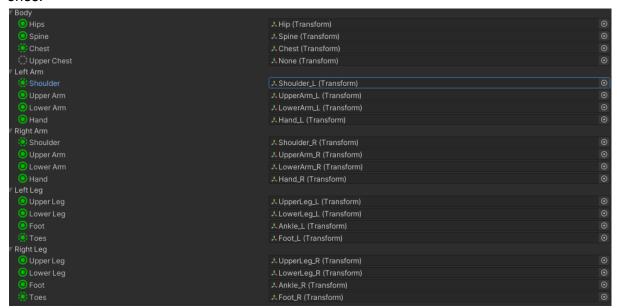
Once your project loads, import your FBX and textures. I like to organise my folders but it's completely up to you.



Now we should set up the FBX and materials. Select your FBX File and in the Model settings select Read/Write and Legacy Blend Shape Normals.



Then go into the Rig settings and set the animation type to Humanoid. You can go into configure and check if Unity is using the correct bones if not then change them to the correct ones.



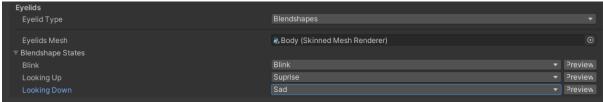
If that's done apply it and drag your FBX into the Hierarchy. Your avatar will look very weird since there aren't any materials set. Create a new Material in the assets folder and change the shader to whatever shader you want to use or just keep the default. (VRChat has a new cool toon standard shader!) Once you made that material you can drag it onto the character in the scene or use KRT Material swap. From there you can mess with the shaders settings.

Select the avatar from the Hierarchy and in the inspector add a VRChat Avatar Descriptor. Edit the view position at the middle of the eyes:



For Lipsync (IF YOU HAVE FOLLOWED THE VISEME STEP) press auto detect and it should find all your visemes. If not you will have to manually add them. In the eyelook tab drag the eye bones from your avatar from the Hierarchy into the correct transform in that tab. Then you can edit the rotation in the 'rotation states'. You can set your

blink animation in the eyelids tab:



But I prefer to have all of that in the FX Layer.

From that your avatar is ready to upload! Follow the steps in <u>uploading a premade avatar</u> section to upload it. (SDK part)

If you want to add toggles or make face expressions click here.

Editing FX layer

Editing the FX Layer

The FX layer is what makes the toggles and expressions work. You will need to know how to use Unity just a tiny bit for this guide, I will try to describe as best as I can for those who are new.

Creating and adding new expressions

First we create new animations for those expressions. Duplicate your avatar and hide the previous one:



Make sure you're using the duplicate to make the animations. Go into the animation tab (next to project assets) and create a new animation. If you don't want to set up a default expression (This avoids weird shapekey issues like going over 100) then go to the next step.

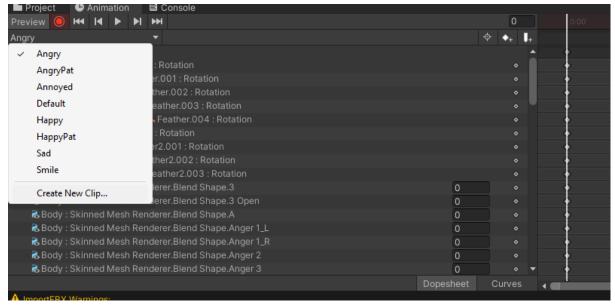
Select the head mesh (should be called Body) and press Add Key on BlendShapes. This should add all your blendshapes to your animation and have them set to zero:



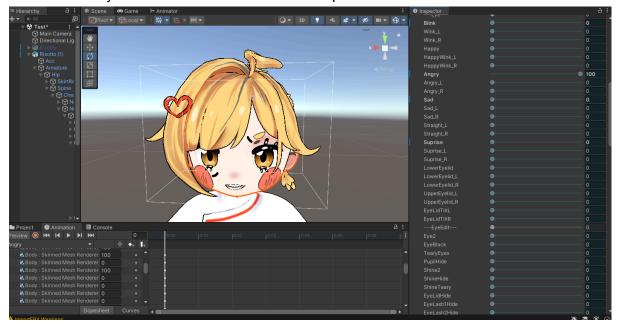
Back in the animation tab remove any blendshapes that you don't want animated like MMD shapekeys, VRChat Visemes ect.. Animating any of those will stop them from working. That should be it for your Default animation. Go back into the assets folder and duplicate the default animation as many times as you want. You will be using the duplicates to make expressions.

Making new expressions

If you made a default animation, rename the duplicates (NOT the original) to any expression you want to make (Happy, Sad, Annoyed, ect.). If you didn't make the default you should still have the duplicate of your avatar and you should make some empty animations. Add them into your animation controller and they should be in the animation tab:



Select an animation and press the record button it should glow red. Go back to your head mesh and now you can use the sliders to make expressions!

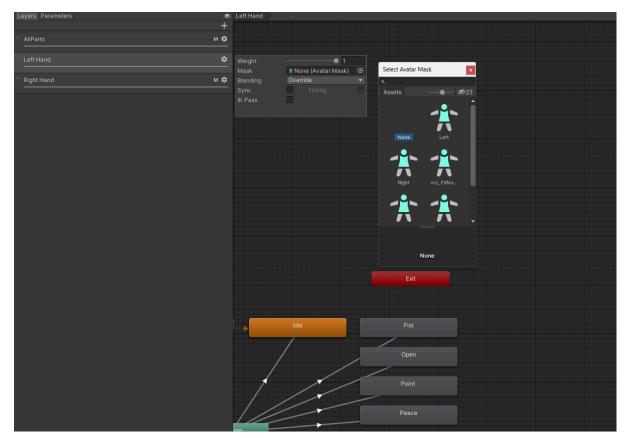


Do this to all the other expressions.

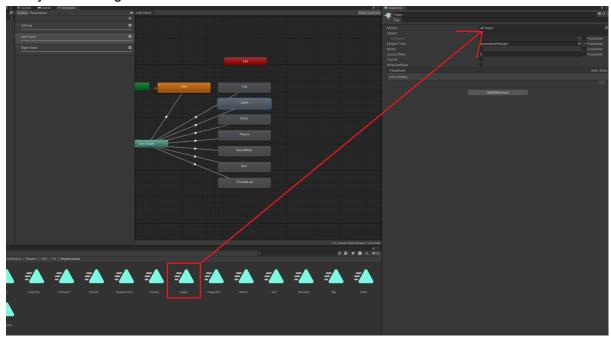
If you don't have an FX Layer to use then create a duplicate of 'VRC_Avatar V3 Hands Layer' which you can find by searching for hands in packages.



Drag the duplicate to the assets folder. Remove the masks for each layer part:



Now you can drag in animations to the hands:



Now you can test it either in unity using Gesture Manager or VRChat!

Optimising Avatars

Optimising an uploaded avatar

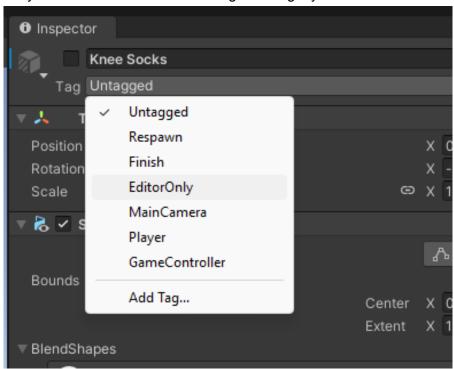
If your avatar has a crazy amount of polygons and has a rating of very poor but you're too lazy to go into blender to fix it, you can use these super cool tools for unity to get that rating from very poor to medium!

You can use Thry's tools to see what is taking so much performance on your avatar: https://github.com/Thrvrallo/VRC-Avatar-Performance-Tools

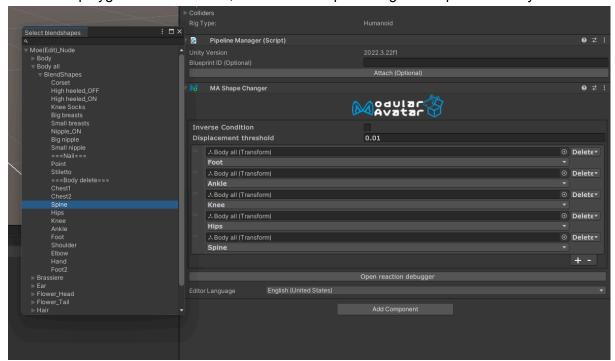
Deleting Polygons under clothing

Modular Avatar now has a component that removes polygons using blendshapes. You can still use <u>Hais Tools</u> to do this too if you prefer.

First check if you have any meshes that you don't need at all. For me it's the socks. You can set it to EditorOnly so when you upload it the socks won't be counted. You can also delete the mesh but if you ever want it back then it might be slightly difficult to do that.



To remove polygons under clothes, add a 'MA Shape Changer' component onto your avatar.



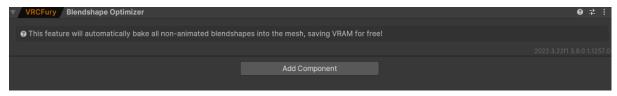
These tools are Non-destructive so you can remove this component at any time without it messing with your avatar. Most outfits using Modular Avatar probably have this component ready.

Lowering VRAM usage

How much VRAM your textures, blendshapes and more take is very important since VRAM is limited. Keeping it at a low number is a must!

Using <u>Thry's Avatar Performance Tools</u> will help you check what is taking up so much VRAM.

If your textures are the problem try lowering the resolution on them. If your blendshapes are the issue VRCFury has a blendshape optimizer. It's non destructive and you don't need to go into Blender!



MochiFitter

MochiFitter

Mochifitter is a tool on Booth that allows you to dress up your avatar in non-compatible clothing.

Let's say you bought an outfit for Manuka but want to put it on Selestia. This tool allows you to do that.

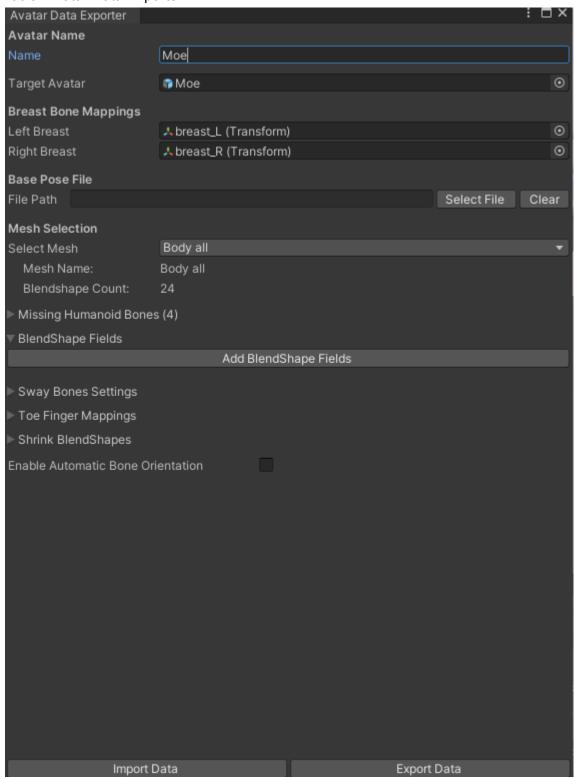
All you need is a profile for that avatar which you can get from Booth or make one yourself. If you do find a profile for your avatar I recommend you use it instead of making one yourself.

Currently the <u>official guide</u> to making a profile is in Japanese but I have tried my best to translate and simplify it. <u>My guide</u> is missing a few details like adjusting for blendshapes and making it reverse compatible.

Mochifitter Profile

Quick Mochifitter guide in english. Use the official japanese guide for details.

Import Mochifitter to Unity Tools>Avatar Data Exporter



Add data, then export. (If your avatar doesn't have toes, shrink blendshapes,ect then ignore) Sway bones -> Bones like thigh, belly and butt (NOT the chest bones)

All exports have to go into OutfitRetargetingSystem>Editor. Do NOT rename any file.

In blender open the template file (Without a = T pose, With a = A pose) Install the plugin to blender and run this:



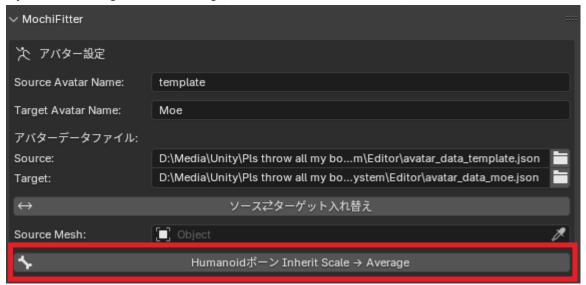
Import avatar FBX and delete everything but the body and head. Set up the mochifitter settings like this:

た アバター設定	
Source Ava	template
Target Avat	Moe
アバターデータファイル:	
Source:	D:\Media\Unity\Pta_template.json
Target:	D:\Media\Unity\Par_data_moe.json

Source avatar has to be template and target avatar is the avatar name.

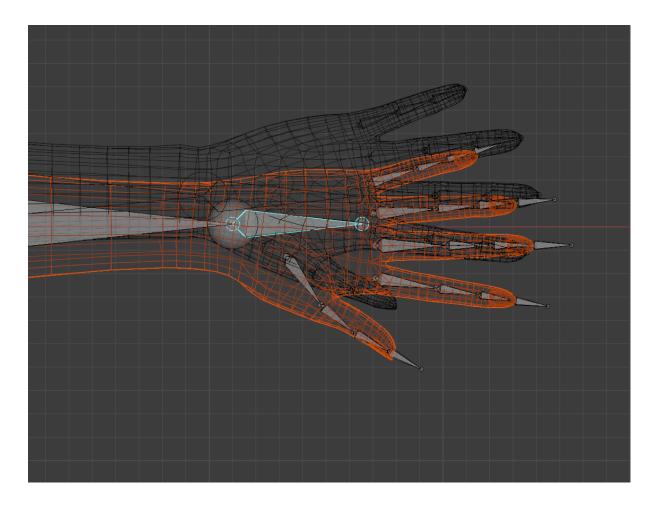
Add the avatar_data_template.json to the source and avatar_data_avatarnamehere.json to target. They should be located in OutfitRetargetingSystem>Editor of your unity file. Do NOT use the .meta files.

If your avatar fingers aren't straight, select the avatars armature and click on this button:



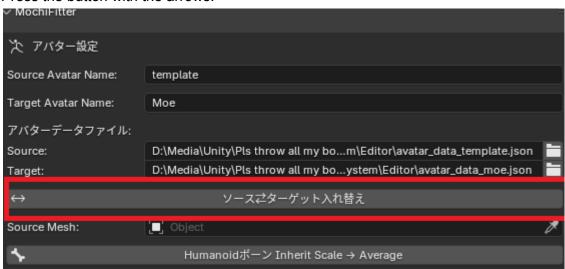
(I think this straightens out the bones but im not sure yet) (I also recommend to press it even if the avatars bones are fine)

Enter pose mode and spread the fingers exactly as the templates.



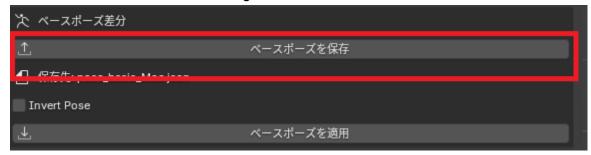
If your avatars thighs leave no gap in the middle, scale the upper leg bone to make them slimmer.

Press the button with the arrows:



This swaps the source and target.

Press the button below the lil dancing man:



Save the pose data to OutfitRetargetingSystem>Editor. Do NOT rename it.

Press the button that swapped the source and target.

Select the templates armature and go into pose mode. We will adjust the template to the avatars shape.

Start with the hip bone and try to match the size and rotation. (remember to check both the side and front) Then go adjust the other bones.

Try not to scale the bones too much and keep them uniform as much as possible! Do not adjust the breast, toe and butt bones. They are hidden by default anyway. Its alright if it doesnt match exactly. This will be fixed in a later step.

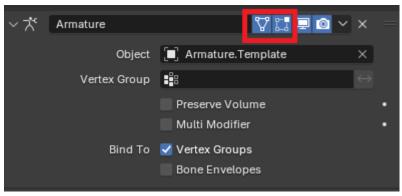
Once you have matched as much as you can, press the button below the lil stick guy holding a square:



As usual, save in the same spot without renaming.

Adjust the template body's shapekeys to the shape of the avatar. Make sure to remember these numbers. Copy it into the note document or something. (upside down triangle)

Create a new shapekey (template body) and go into the modifier tab (blue wrench) and make sure these two are on:



∨ Shape Keys Basis Breasts_big ~ 0.084 Breasts_flat 0.000 Highheels 0.651 Key 4 Relative Value Range Min 1.000 Max Vertex Group Relative To D Basis

Add Rest Position

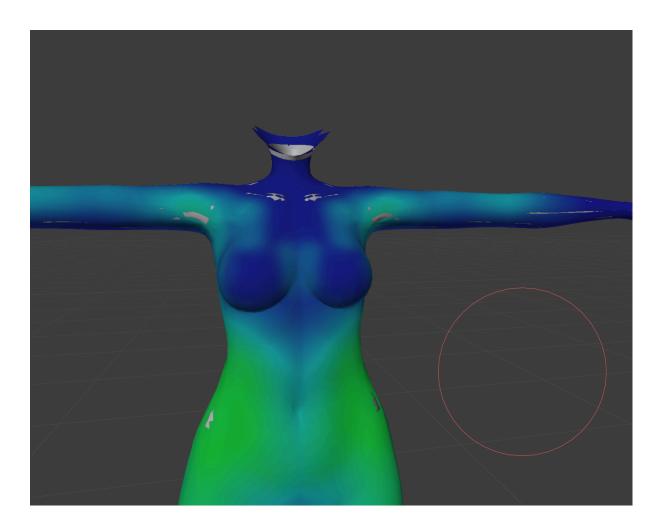
Go back to the data tab with your shapekey and press shapekey edit mode:

Increase the value of the new shapekey to 1.

Now you can adjust the body properly to the avatar. Its important to aim to get the crotch as close as possible to the avatars shape. Fingers too for gloves. Dont worry about the feet too much.

After that go back to the modifier tab and make the first shrinkwrap modifier target your avatars body.

Do the same for the other then go into weight paint mode select the shrink3 vertex group. Weight paint the protruding parts of the avatars body so it matches. Add more weight to the joints for less clipping.

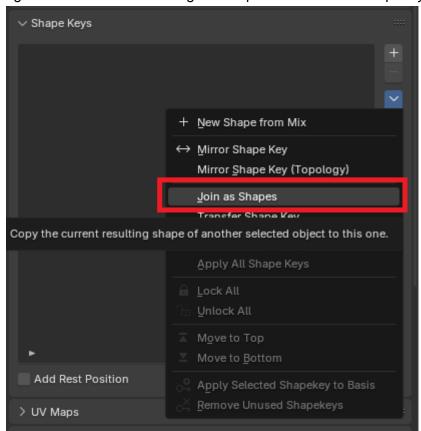


Make two copies of the template body. Delete the shrinkwrap modifiers from the first copy. (HIDE THE ORIGINAL TEMPLATE BODY FOR NOW)

Select both the copies and convert them as meshes.

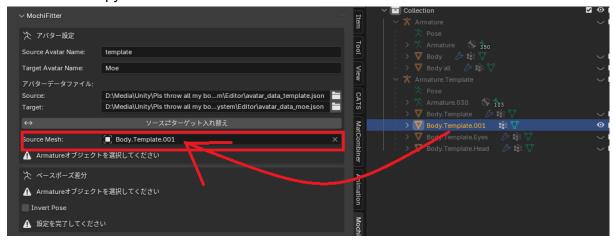
Select the one that had the shrinkwrap removed then select the one that was left the same.

Again do not work on the original template. Go into the shapekey tab and select:



The body with the deleted shrinkwraps should have gotten a new shapekey. Delete the other body copy.

Throw in the copy to source mesh:



Click on the button here and select the blendshape name and set this option to 2:



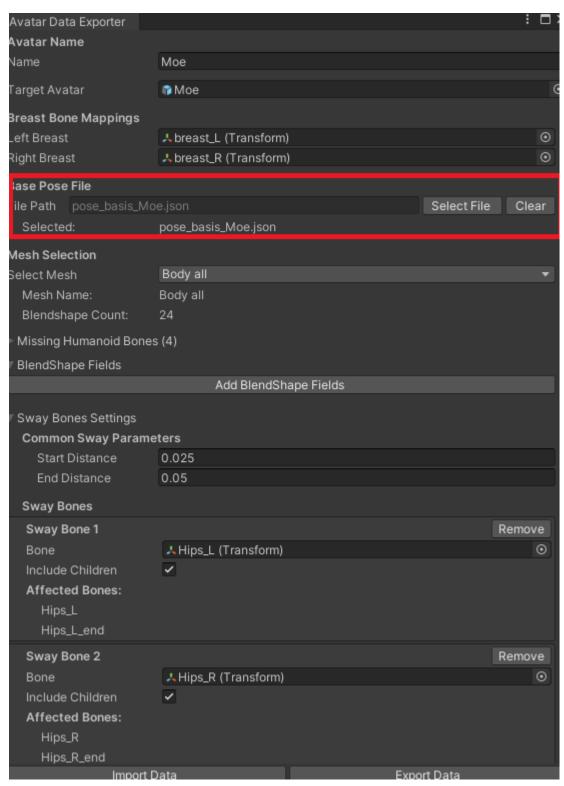
Make sure everything else is left untouched and empty.

If your avatar is NOT symmetrical, press the enable x mirror button. And then press the play button:



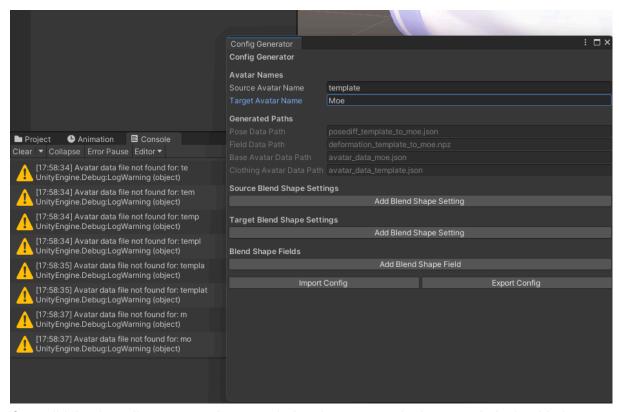
Save in the same place and then wait until its done.

Go back to unity and in the Avatar Data Exporter window fill in the base pose file:



Save that.

Open Tools>Config Generator Fill in the target and source:



If you didn't misspell your avatar's name during the process, in the console it should give an error where it couldn't find your avatar's name without the last letter.

If it gives an error with the full avatars name then you need to go back and check the names of the files. They should have the same name.

Then add source blendshapes (the blendshapes you touched in blender)



Set them to the correct amount. You should have recorded this or used the OG template body's values.

After that export. It's ready for use.

Adding support for blendshapes.