Face Tracking Template Setup
By Adjerry91

Introduction

This setup will go over how to set up the face tracking template animations to drive blendshapes and eye movements to Unity for VRChat.

Prerequisites

- [VRCFaceTracking](#) setup and working. **Test public face tracking avatars first before doing customs.**
- Avatar with [SRanipal](#), [ARkit](#), and [UnifiedExpressions](#) Blend Shapes - *Case Sensitive* Note what version is being used on the avatar.
- Blendshapes on Skinned Mesh Render named "Body" in the root of the avatar
- Avoid unpacking FBX, make sure eye bones are assigned rig configuration before unpacking.
- Determine whether the existing animations are Write Defaults ON or OFF.

Support

See the avatar-help-forum for advance support on VRCFaceTracking [Discord](#)

Face Tracking Menu Controls

Face tracking template has menu controls to allow toggling of the following:

- EyeTrackingActive (Bool) - If true enables all eye tracking animations (VRCFaceTracking) and disables VRChat eye tracking
- LipTrackingActive (Bool) - If true enables all lip tracking animations (VRCFaceTracking)
- Visemes (Bool) - If true enables Visemes
- EyeDilation (Bool) - If true enables dilation
- Quest Pro (Bool) - Turns on brow control and Quest Pro shapes

Setup Tools

[VRLabs Avatars 3.0 Manager](#) - Merge template animations to existing animations on avatar
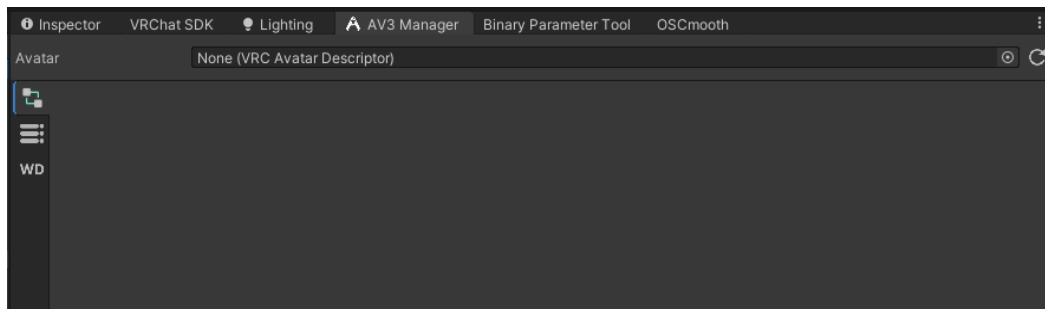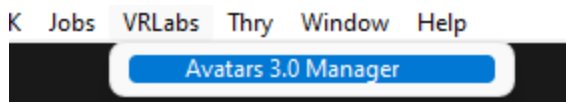
Useful Tools

[Lyuma Av3Emulator](#) - Emulate avatar within unity.
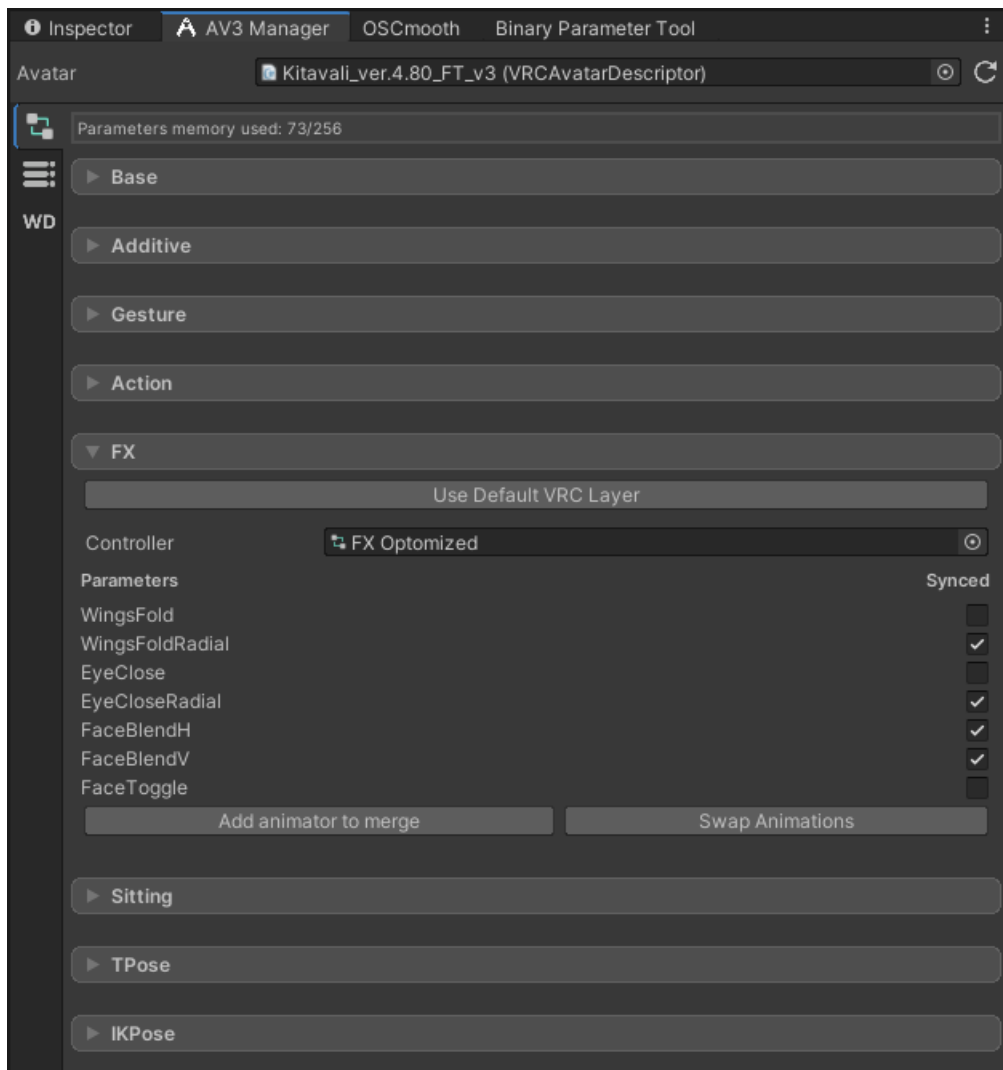
[BinaryParameterTool](#) - Creation of binary layers

[OSCmooth](#) - Creation of smoothing layers

Main Setup

- ☐ Import [VRCFaceTracking_Templates_vX.X.X.Unitypackage](#)
- ☐ Import [Avatars_3.0_Manager_X.X.XX.Unitypackage](#)
- ☐ Show Avatar 3.0 Manager Window. *You can place the window wherever as desired*
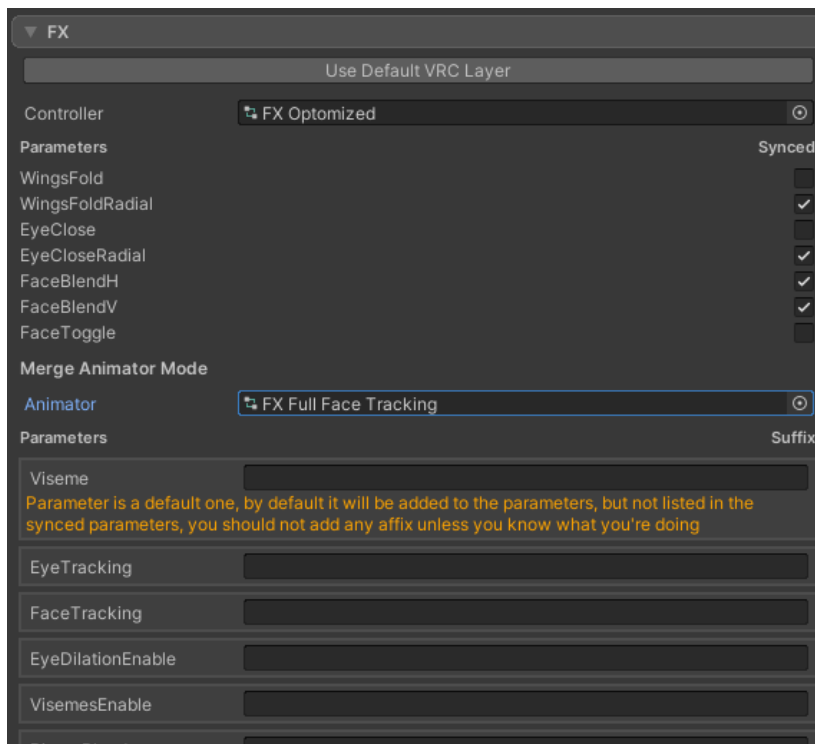
☐ Add avatar to AV3 Manager and go to FX section

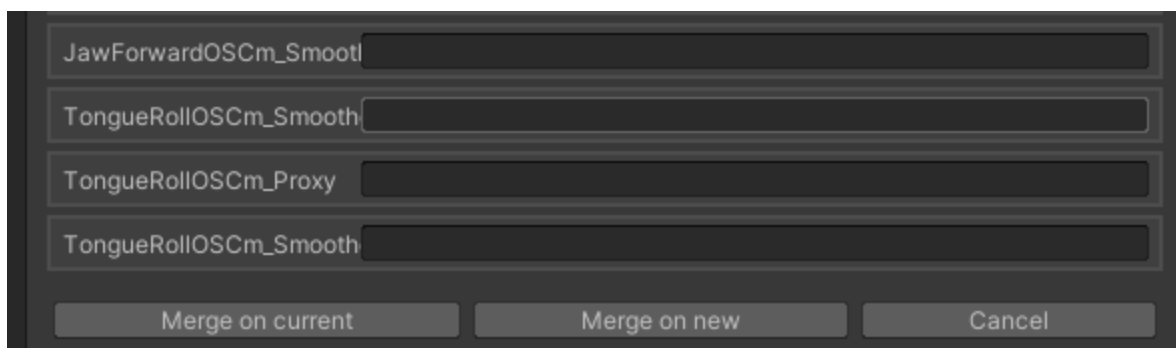
☐ Click Add animator to merge on the FX animator.

Select appropriate FX controller template for what blendshapes are being used on the avatar. Note that WD suffix is for Write Defaults ON. Templates are located in **VRCFaceTracking > VRCFT Templates**
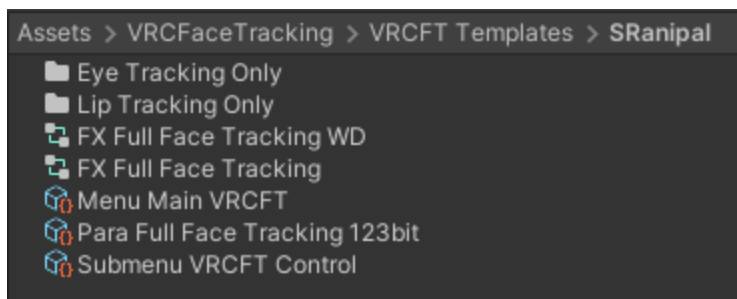
☐ Scroll down the parameter to be merged to make sure there aren't any duplicates. If it is orange and adds a suffix you don't want that as face tracking parameters are case sensitive.

☐ *Merge on current* to merge **FX Full Facetracking** animator

☐ *Add animator to merge* **Additive Eye Tracking** to additive layer.

Note - This layer drives the animator eye positions in the armature rig, if eyes are
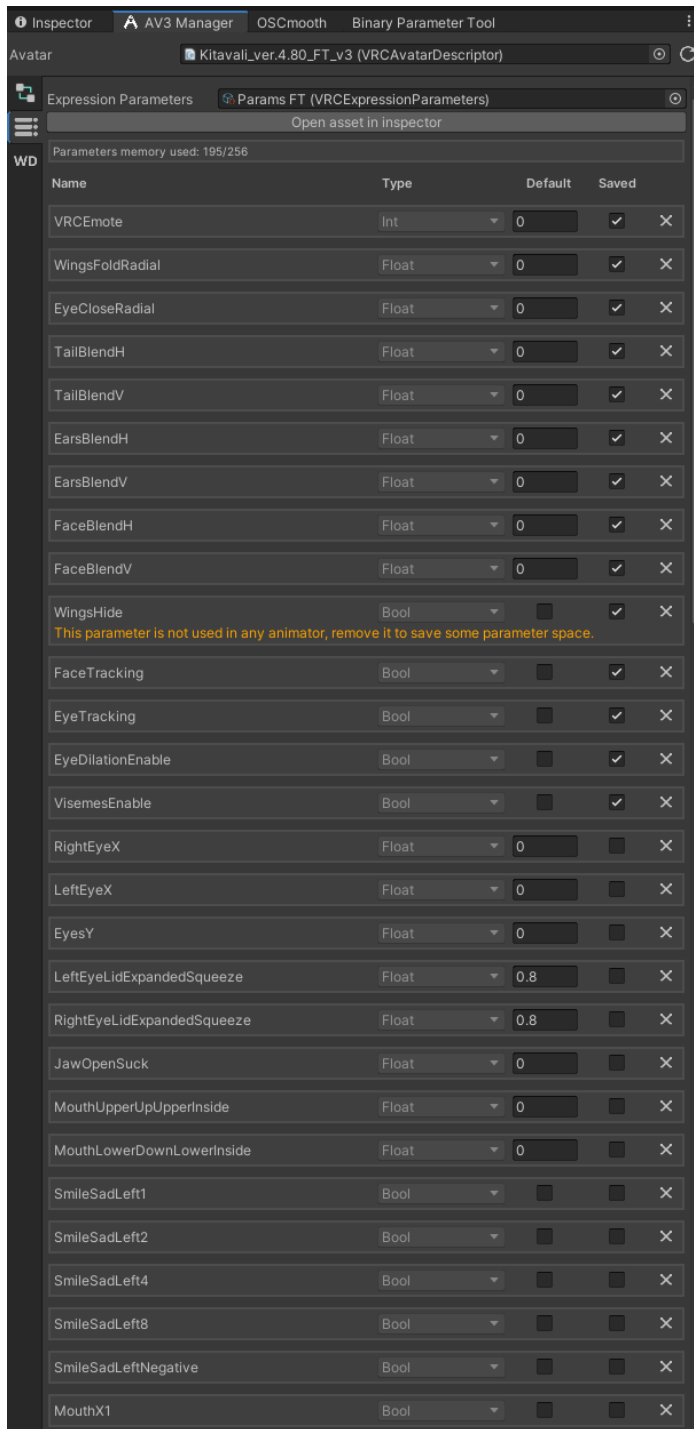not moving when testing make sure eye bones are assigned
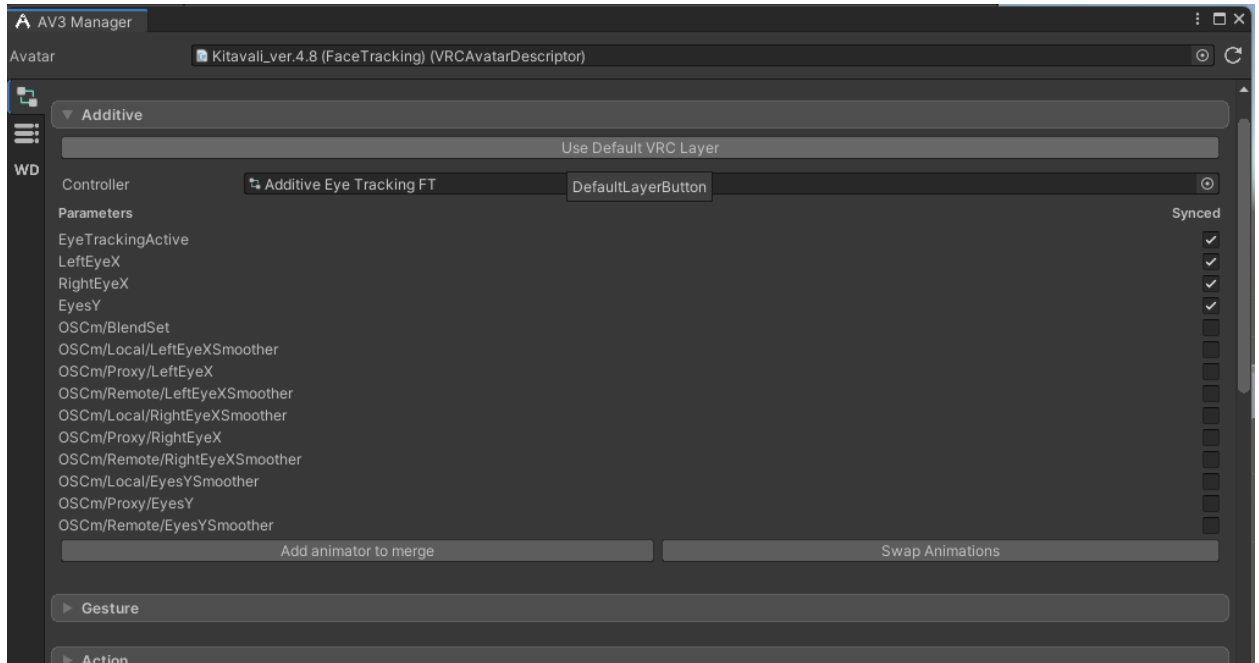
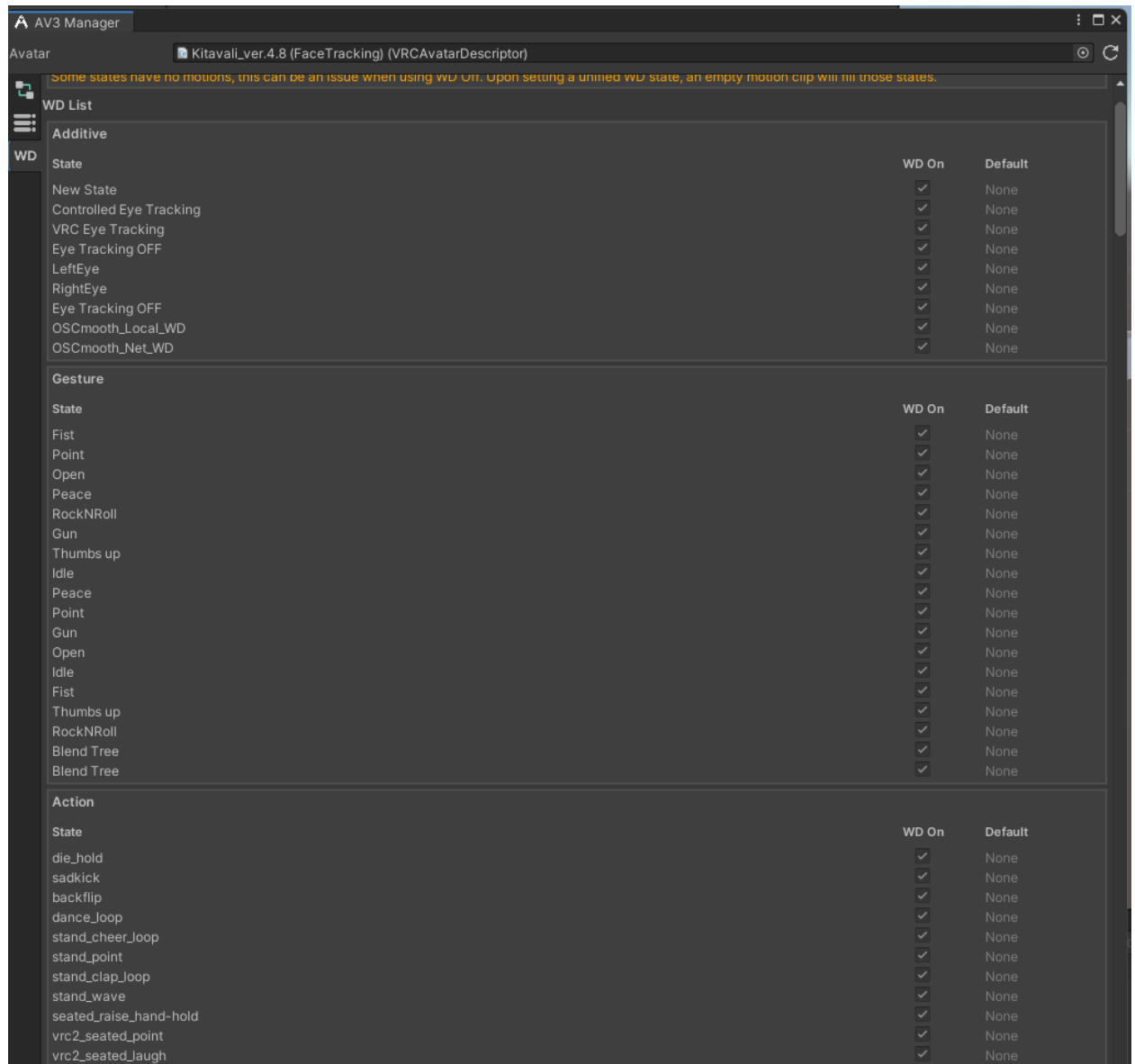☐ The second tab of AV3 manager can be used to copy parameters from the template. Merge face tracking parameters
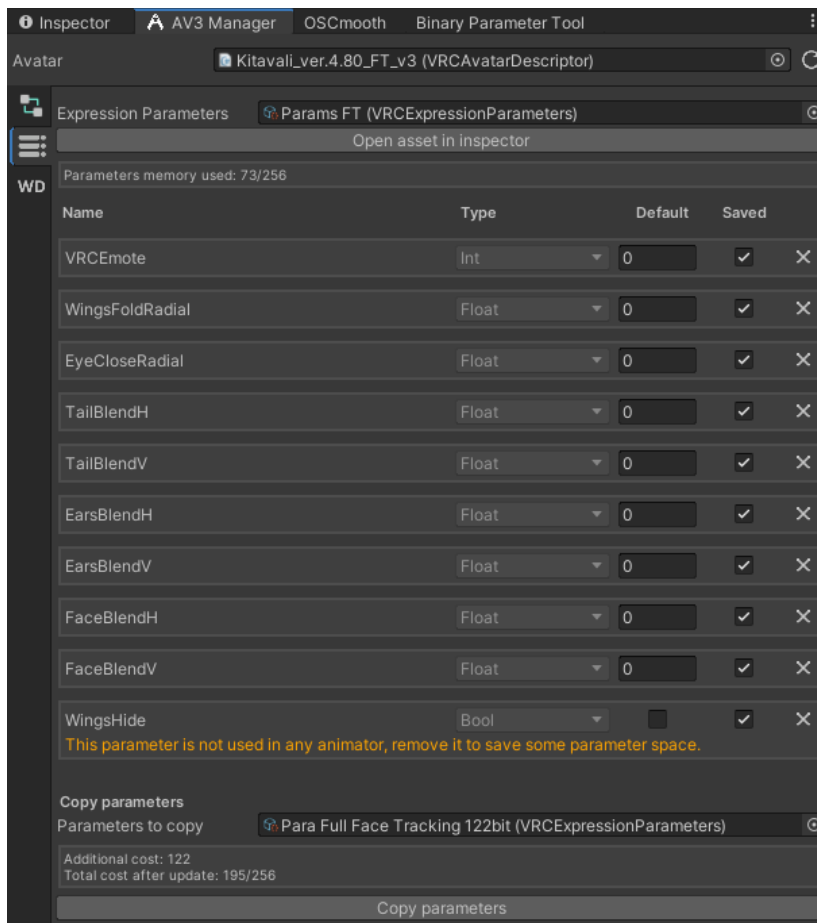
When copied you should see all the sync parameters
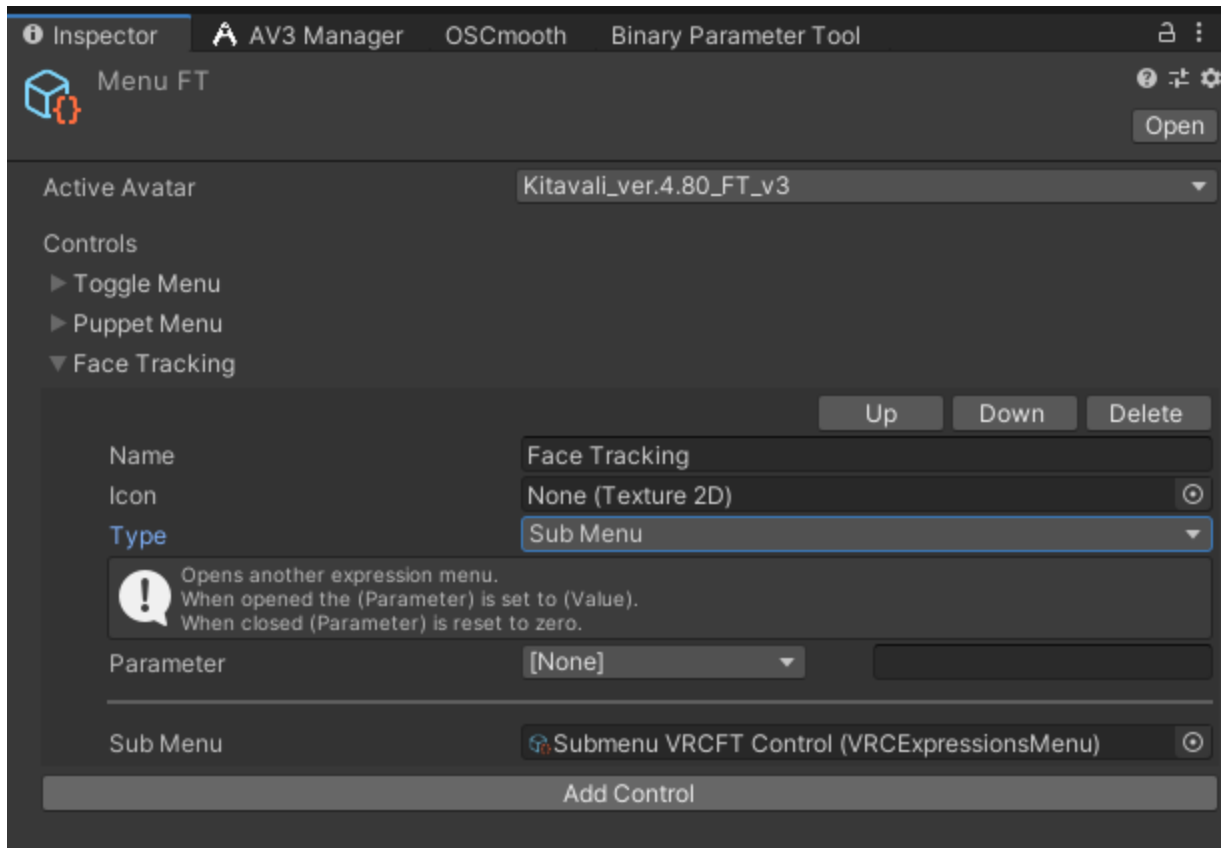

☐ Last tab of AV3 Manager shows the write default states. The Write Default of the face tracking should match the existing animations Write Defaults states. Avoid changing the Write Defaults OFF for WD template as it will break the OSCmooth
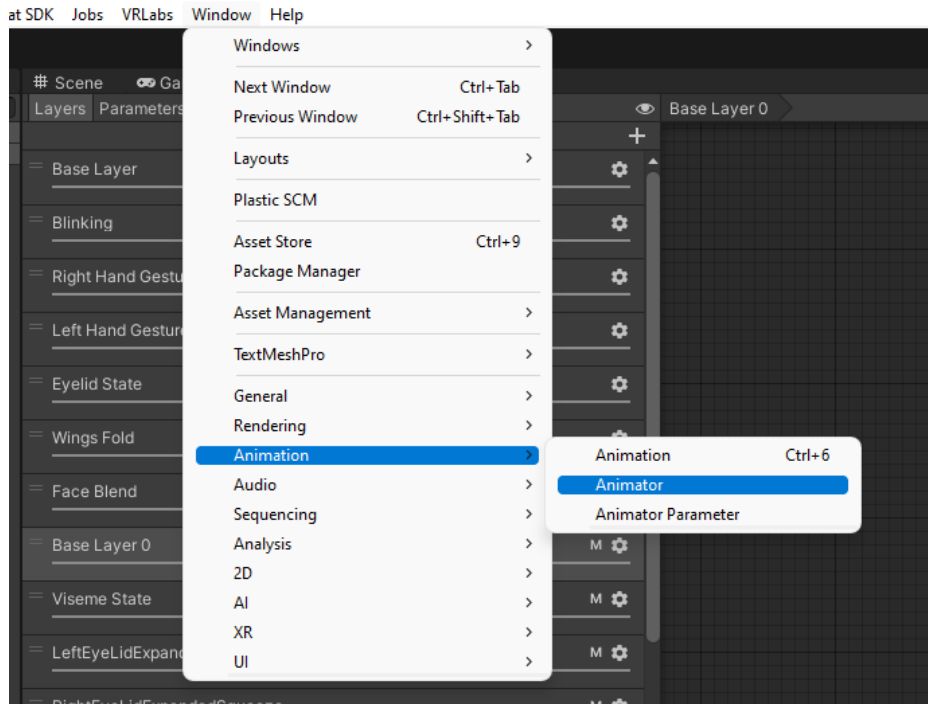
layer.

AV3 Manager

Avatar   Kitavali_ver.4.8 (FaceTracking) (VRCAvatarDescriptor)

Some states have no motions, this can be an issue when using WD Off. Upon setting a unified WD state, an empty motion clip will fill those states.

WD List

Additive

State	WD On	Default
New State	✓	None
Controlled Eye Tracking	✓	None
VRC Eye Tracking	✓	None
Eye Tracking OFF	✓	None
LeftEye	✓	None
RightEye	✓	None
Eye Tracking OFF	✓	None
OSCmooth_Local_WD	✓	None
OSCmooth_Net_WD	✓	None

Gesture

State	WD On	Default
Fist	✓	None
Point	✓	None
Open	✓	None
Peace	✓	None
RockNRoll	✓	None
Gun	✓	None
Thumbs up	✓	None
Idle	✓	None
Peace	✓	None
Point	✓	None
Gun	✓	None
Open	✓	None
Idle	✓	None
Fist	✓	None
Thumbs up	✓	None
RockNRoll	✓	None
Blend Tree	✓	None
Blend Tree	✓	None

Action

State	WD On	Default
die_hold	✓	None
sadkick	✓	None
backflip	✓	None
dance_loop	✓	None
stand_cheer_loop	✓	None
stand_point	✓	None
stand_clap_loop	✓	None
stand_wave	✓	None
seated_raise_hand-hold	✓	None
vrc2_seated_point	✓	None
vrc2_seated_laugh	✓	None

☐ Add Face Tracking control menu

Main setup is now complete; face tracking should be functional at this stage. Additional setup is needed for avatars with hand emotes and other face controls that may interfere with face tracking.
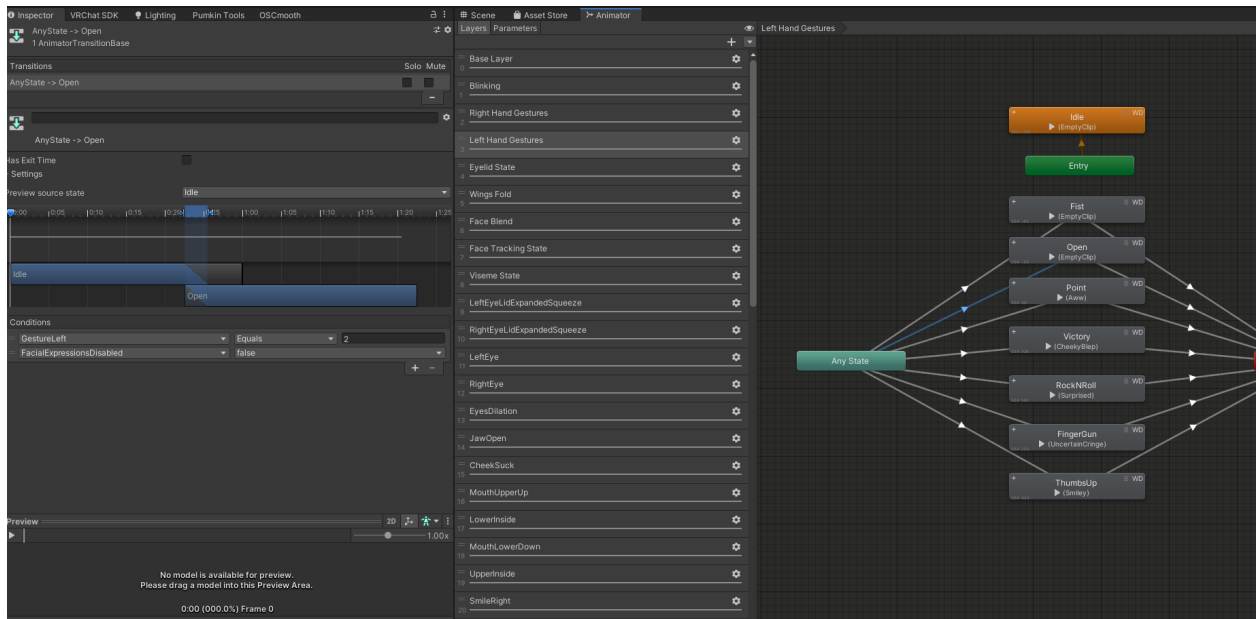
Additional Setup

☐ Show Animator and Animation Windows

☐ Delete **Base Layer 0** - There is nothing in this layer from the animator merge

☐ Add conditional to not do hand emotes with FacialExpressionsDisabled. Click plus icon and add FacialExpressionsDisabled and set it to False**.** The toggle will

automatically turn off gestures when starting face or eye tracking.

☐ Add disable to any idle blink with eye tracking.
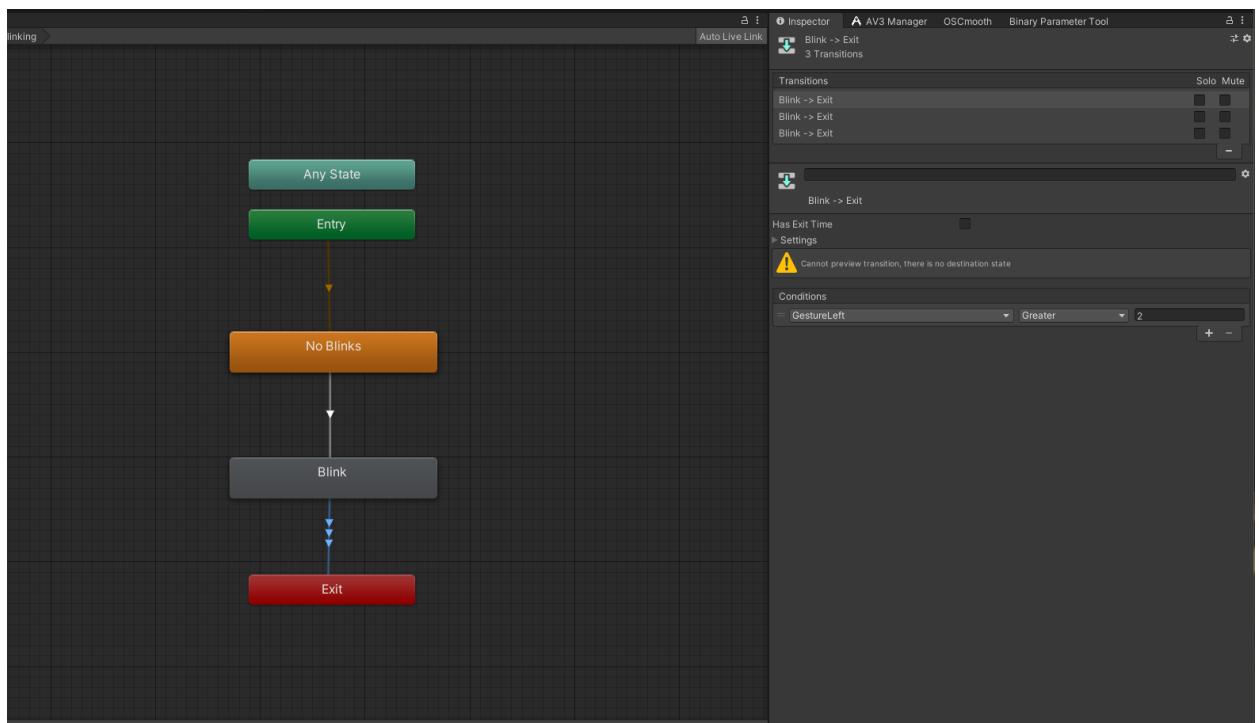
Note the multiple arrows on the exit transitions is equivalent to "OR" logic statement. Right click transition from and select make transition then select exit as the destination. Click the exit transition arrows and you will see a new transition added to the list. Expand the settings, uncheck the exit time and change the

transition duration desired, this is the time delay for the transition, add eyetracking is **True** to the conditions.
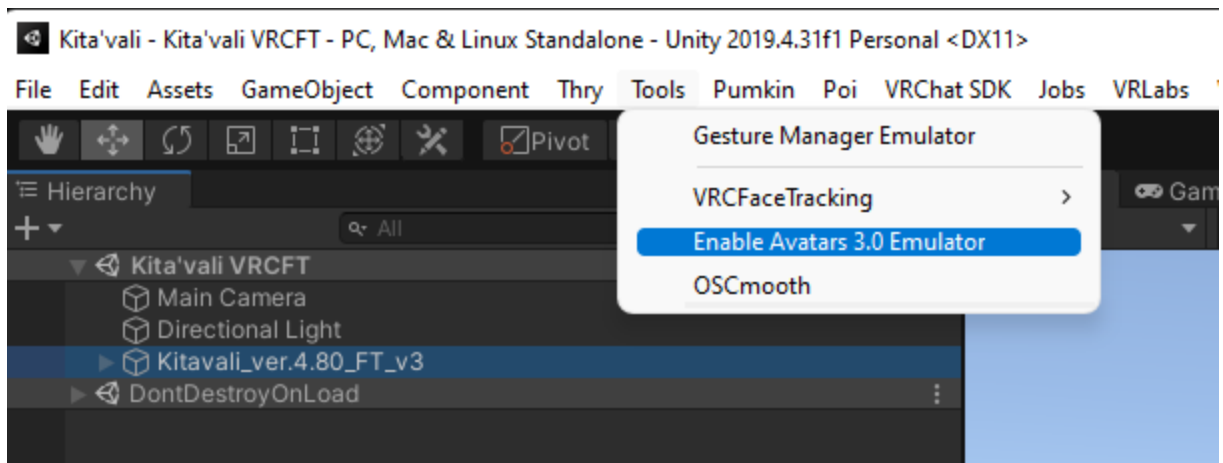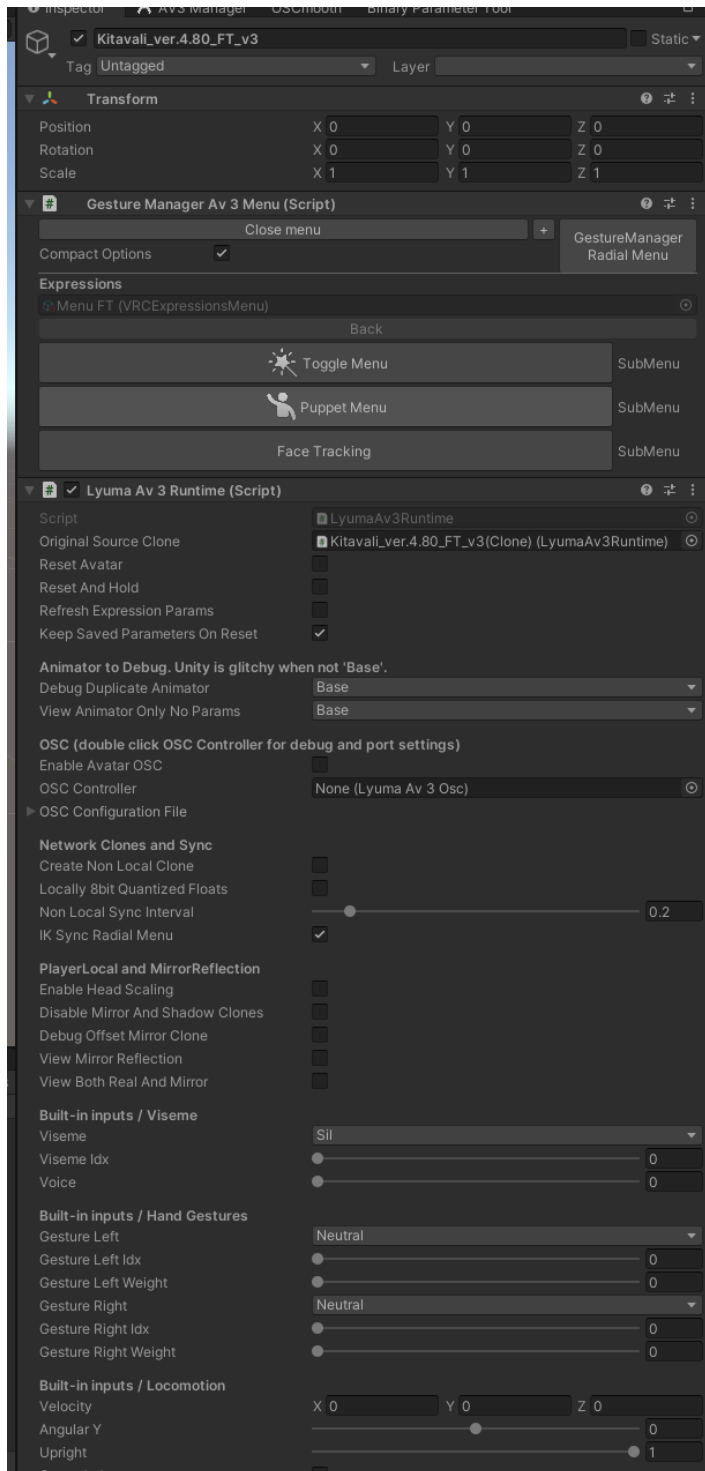
Testing in Unity

☐ Import [Lyuma Av3Emulator](#)
- Note the [Gesture Manager](#) addon should be removed as Lyuma's is fork
- Lyuma's version has better debugging for face tracking

☐ Click on play mode in Unity
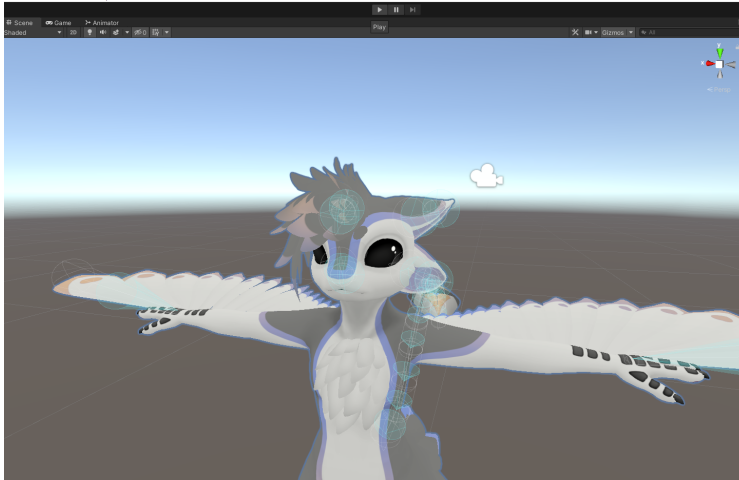
☐ Enable **Avatar 3.0 Emulator**
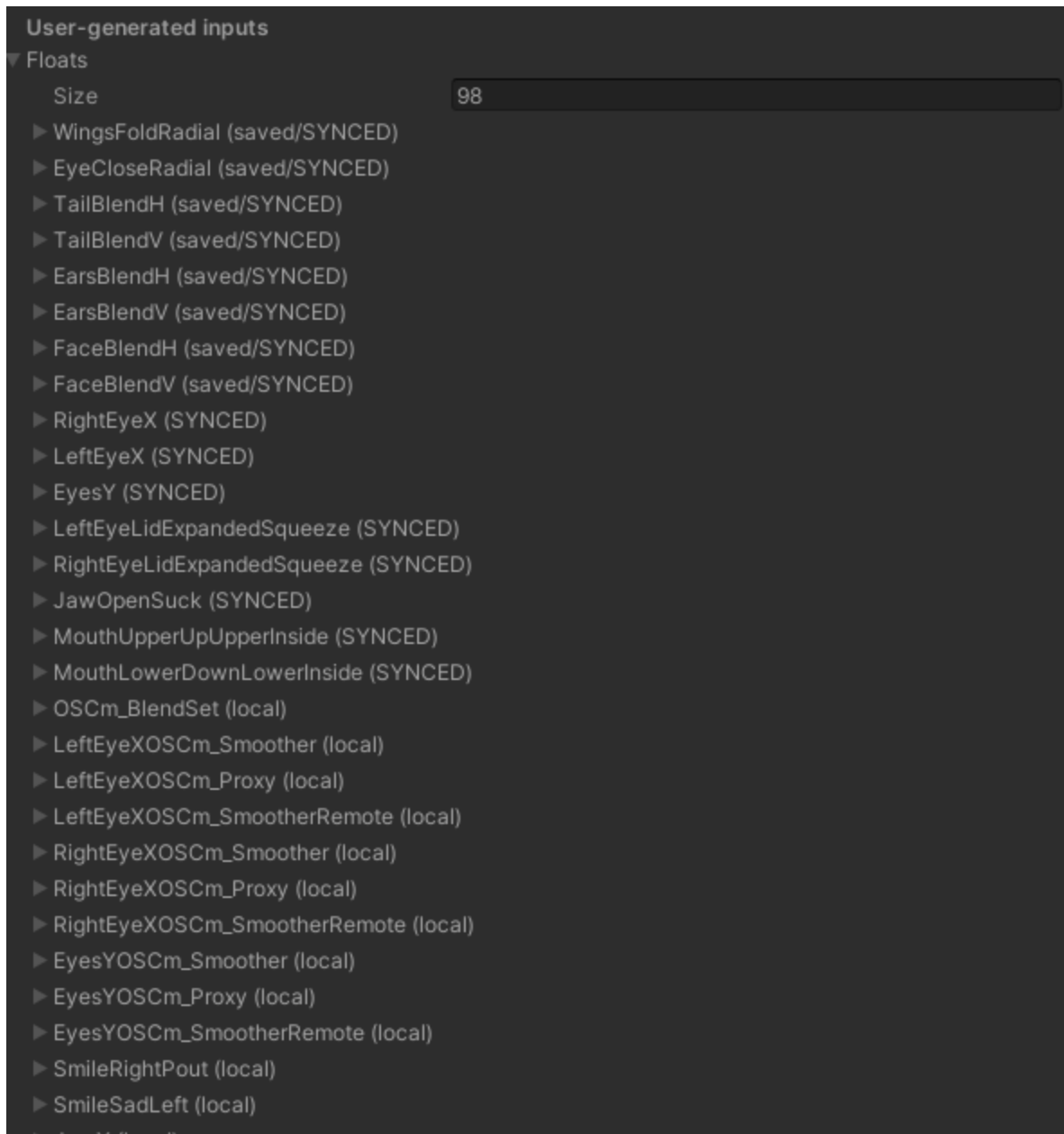
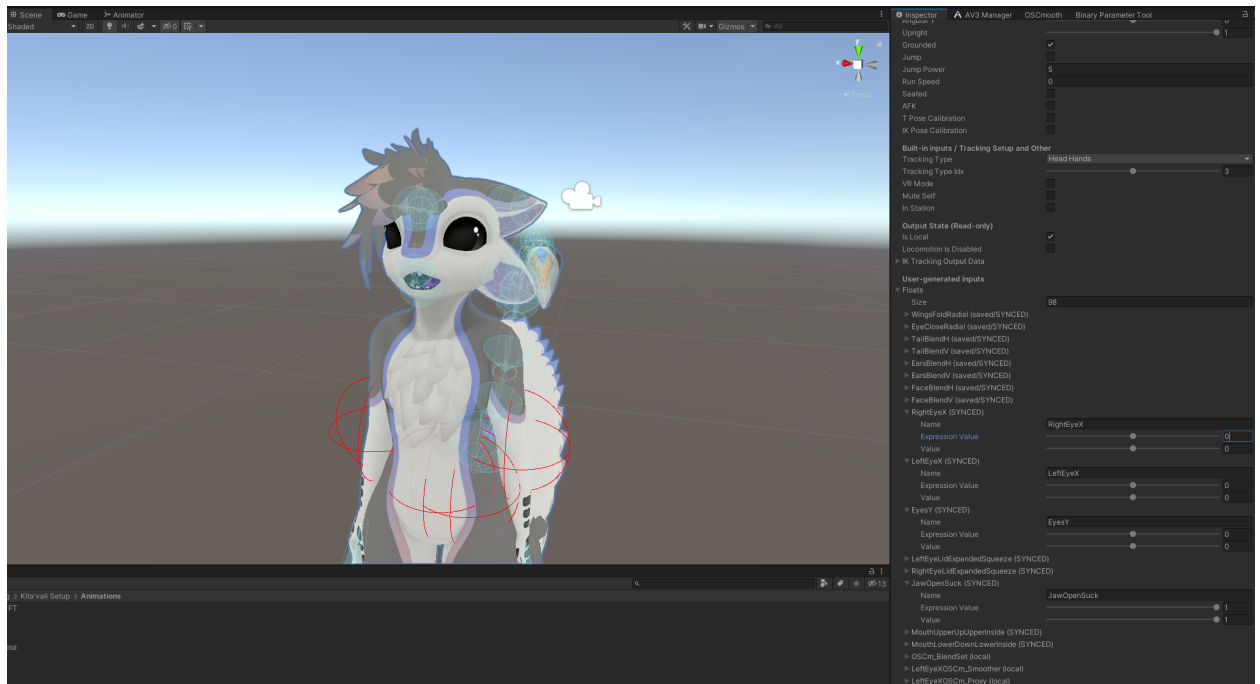☐ Click on the avatar to test. You will see a Gesture Manager Av 3 Menu and Lyuma Av 3 Runtime on the avatar.

☐ Go in menu an enable eye and lip tracking

☐ Scroll down the inspect to the Use-generated input section and expand floats. Not that the eye tracking parameters state **SYNCED**, the parameters will be network synced in the game

User-generated inputs
▼ Floats
    Size   98
    ▶ WingsFoldRadial (saved/SYNCED)
    ▶ EyeCloseRadial (saved/SYNCED)
    ▶ TailBlendH (saved/SYNCED)
    ▶ TailBlendV (saved/SYNCED)
    ▶ EarsBlendH (saved/SYNCED)
    ▶ EarsBlendV (saved/SYNCED)
    ▶ FaceBlendH (saved/SYNCED)
    ▶ FaceBlendV (saved/SYNCED)
    ▶ RightEyeX (SYNCED)
    ▶ LeftEyeX (SYNCED)
    ▶ EyesY (SYNCED)
    ▶ LeftEyeLidExpandedSqueeze (SYNCED)
    ▶ RightEyeLidExpandedSqueeze (SYNCED)
    ▶ JawOpenSuck (SYNCED)
    ▶ MouthUpperUpUpperInside (SYNCED)
    ▶ MouthLowerDownLowerInside (SYNCED)
    ▶ OSCm_BlendSet (local)
    ▶ LeftEyeXOSCm_Smoother (local)
    ▶ LeftEyeXOSCm_Proxy (local)
    ▶ LeftEyeXOSCm_SmootherRemote (local)
    ▶ RightEyeXOSCm_Smoother (local)
    ▶ RightEyeXOSCm_Proxy (local)
    ▶ RightEyeXOSCm_SmootherRemote (local)
    ▶ EyesYOSCm_Smoother (local)
    ▶ EyesYOSCm_Proxy (local)
    ▶ EyesYOSCm_SmootherRemote (local)
    ▶ SmileRightPout (local)
    ▶ SmileSadLeft (local)

☐ Test each of the sync float parameters to see to test that they control the avatar.

☐ When done with the float sync parameters now to test the binary parameters. Go to the Bools section.
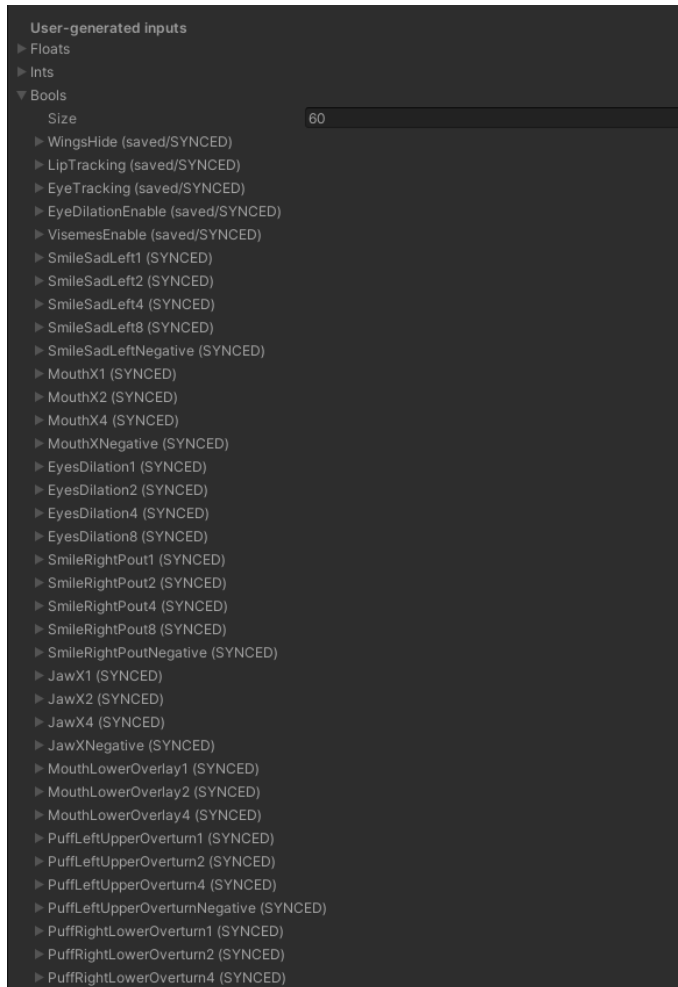
☐ Only need to really test the max values. Show the max bool and negative to test
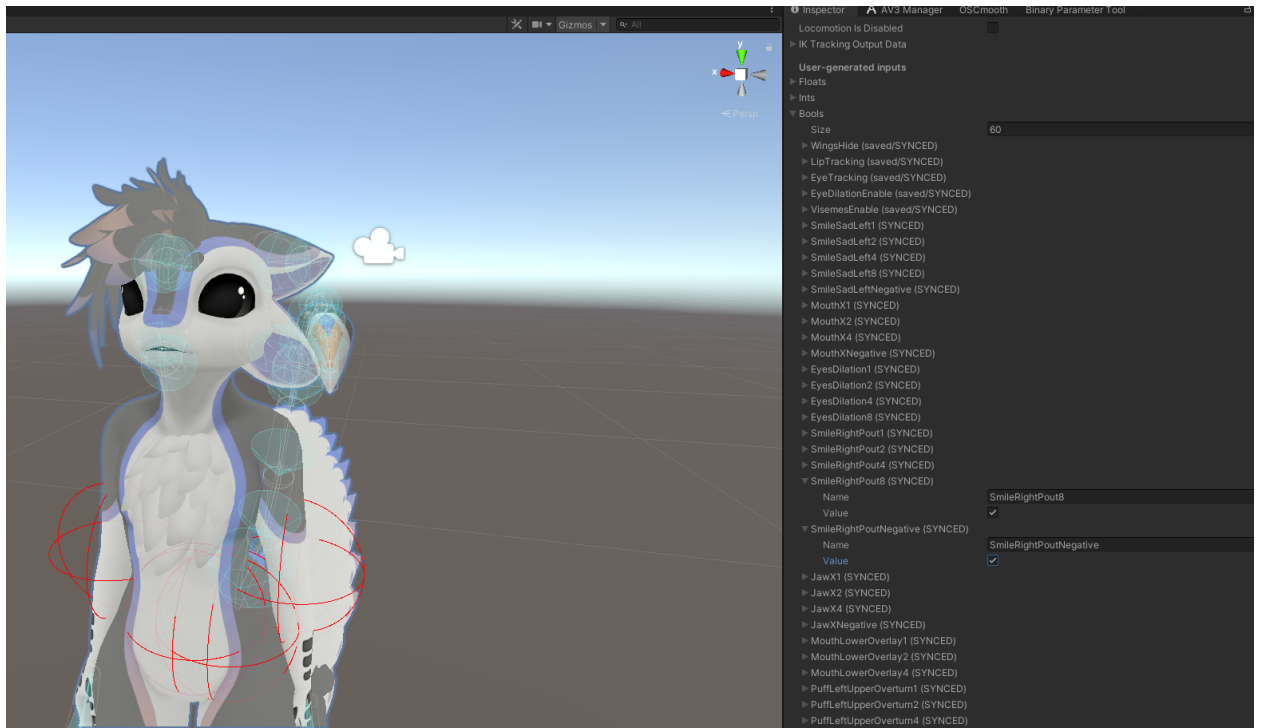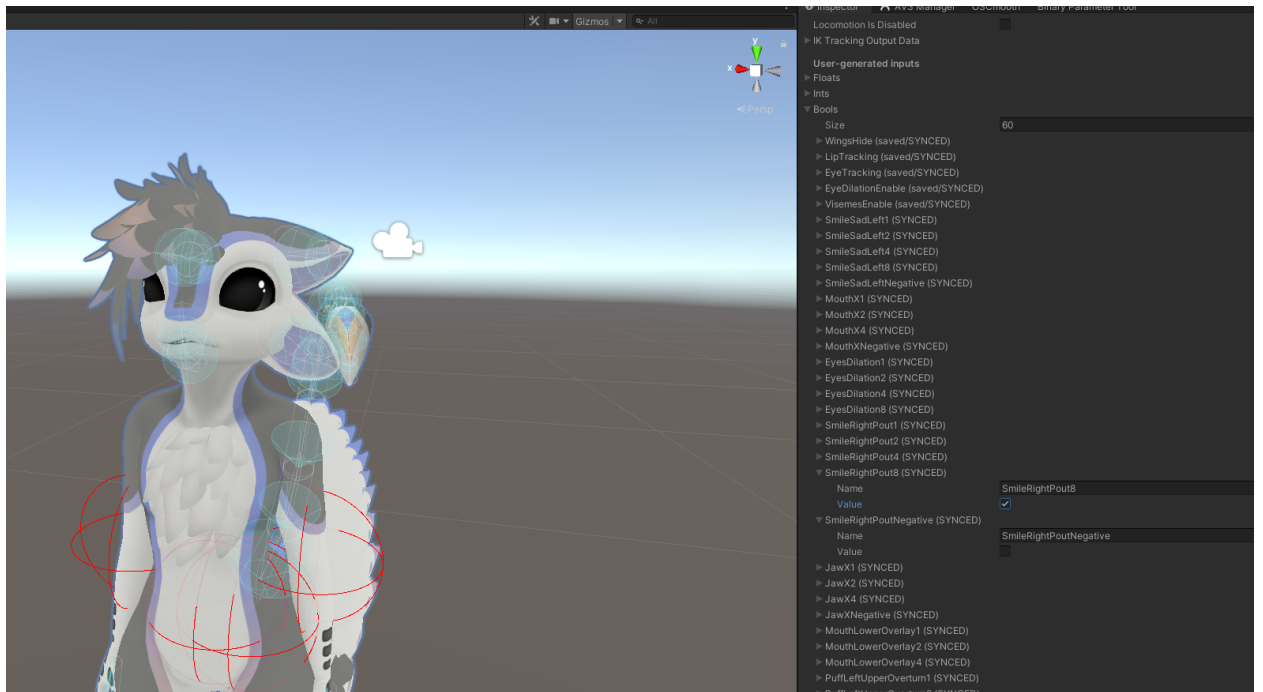
Types of Face Tracking Layers

There are three different animation layers with different functions for face tracking in the animator.

1. Face tracking parameters OSC values come in as floats and bools.
2. Bools are converted to floats with binary layers
3. Floats are then smoothed with smoothing logic from OSCmooth to make face tracking not choppy with OSC
4. Proxy values will drive the driver layers to control the face tracking blendshapes/animations i.e. OSCm/Proxy/JawOpen

Face Tracking Binarys

Face Tracking Floats

Binary Layers → Smoothing Layer → Driver Layers
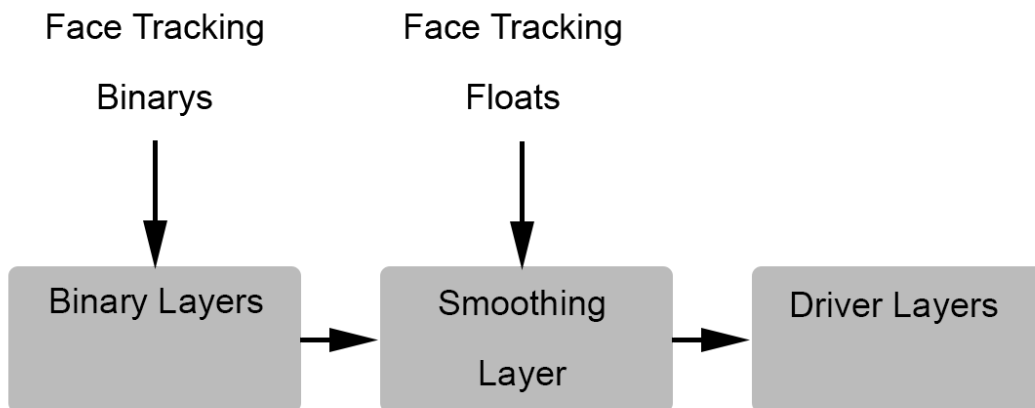
Binary Layers

These layers are generated by the [Binary Parameter Tool](#). These layers take [binary parameters](#) to reduce the amount of parameters on the avatar at the cost of resolution. Output of the layer is face tracking parameter float.
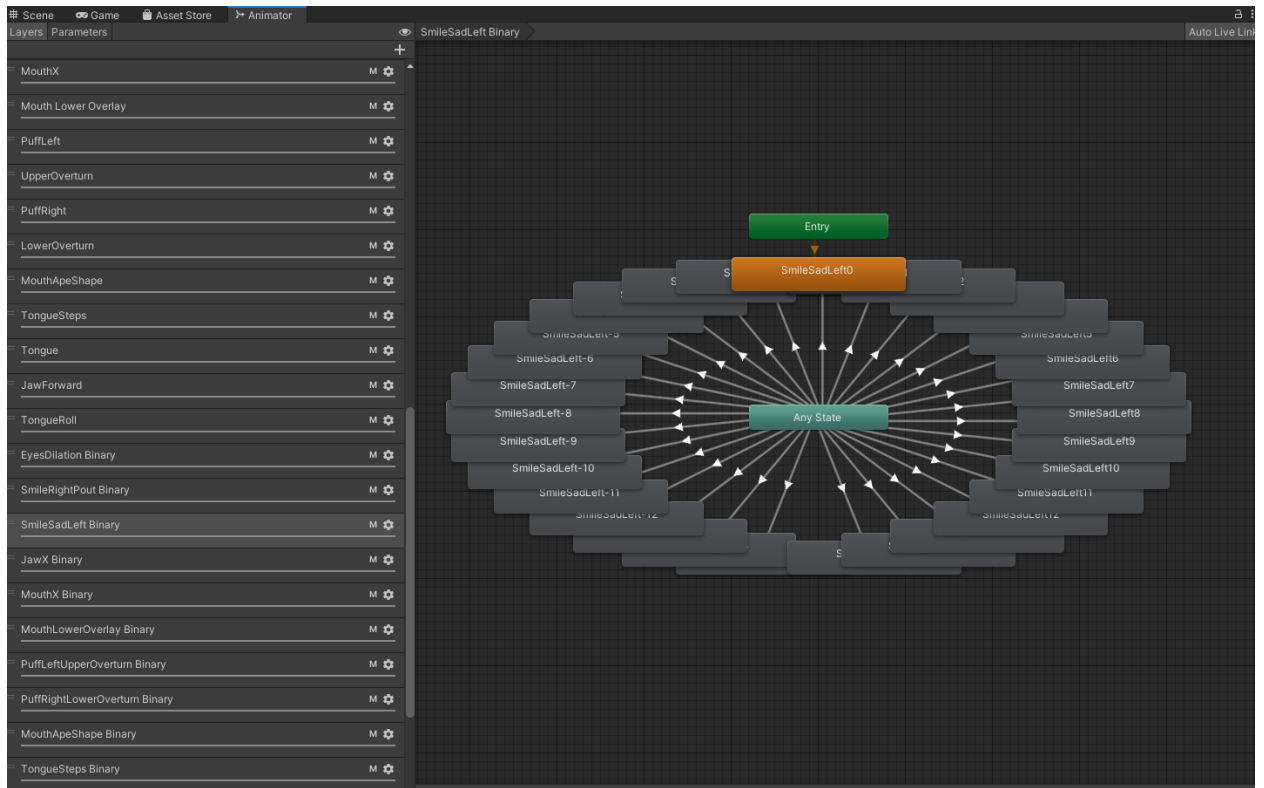
Smoothing Layer

These layers are generated by [OSCmooth](#) tool. This has local and remote switch bases on the **isLocal** bool provided natively from VRChat.
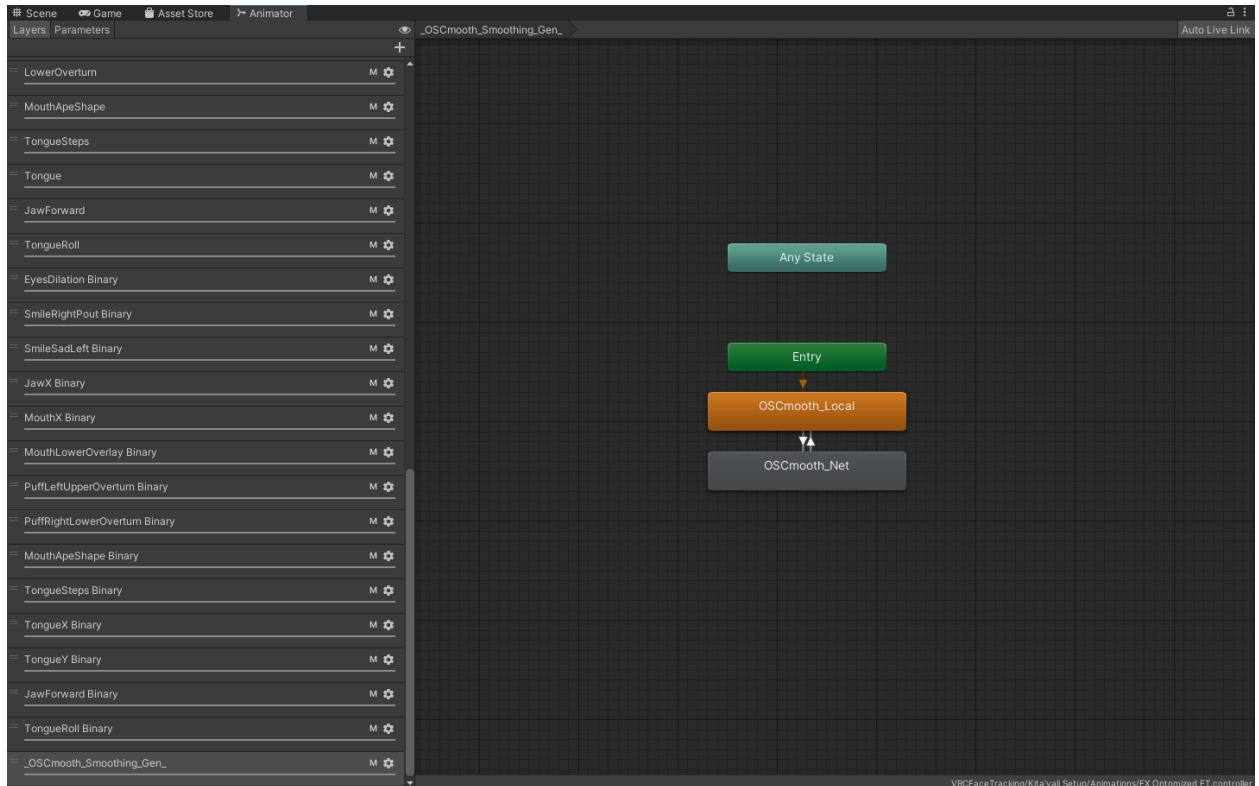

Smooth parameters have the prefix **OSCm/Local/** and **OSCm/Remote/** with the **Smoother** tag. These values can be changed as desired the higher the value more smooth lower the value less smooth. Do not set it exactly to 1 otherwise the smoothing is infinite so it freezes. This layer takes the face tracking float parameter and the output is float with the **OSCm/Proxy/** prefix. Local is lower smoothing as the OSC update rate is good for local view but is slow for remote users, so more smoothing is used for the remote users. All smoother values a static variable and do not change and do not need to be networked.

IsLocal	☐
OSCm/BlendSet	1
OSCm/Local/LeftEyeXSmoother	0.15
OSCm/Proxy/LeftEyeX	0
OSCm/Remote/LeftEyeXSmoother	0.7
OSCm/Local/RightEyeXSmoother	0.15
OSCm/Proxy/RightEyeX	0
OSCm/Remote/RightEyeXSmoother	0.7
OSCm/Local/EyesYSmoother	0.15
OSCm/Proxy/EyesY	0
OSCm/Remote/EyesYSmoother	0.7
OSCm/Local/LeftEyeLidExpandedSqueezeSmoother	0.15
OSCm/Proxy/LeftEyeLidExpandedSqueeze	0
OSCm/Remote/LeftEyeLidExpandedSqueezeSmoother	0.5
OSCm/Local/RightEyeLidExpandedSqueezeSmoother	0.15
OSCm/Proxy/RightEyeLidExpandedSqueeze	0
OSCm/Remote/RightEyeLidExpandedSqueezeSmoother	0.5
OSCm/Local/JawOpenSuckSmoother	0.15
OSCm/Proxy/JawOpenSuck	0
OSCm/Remote/JawOpenSuckSmoother	0.7
OSCm/Local/MouthUpperUpUpperInsideSmoother	0.15
OSCm/Proxy/MouthUpperUpUpperInside	0
OSCm/Remote/MouthUpperUpUpperInsideSmoother	0.7
OSCm/Local/MouthLowerDownLowerInsideSmoother	0.15
OSCm/Proxy/MouthLowerDownLowerInside	0
OSCm/Remote/MouthLowerDownLowerInsideSmoother	0.7

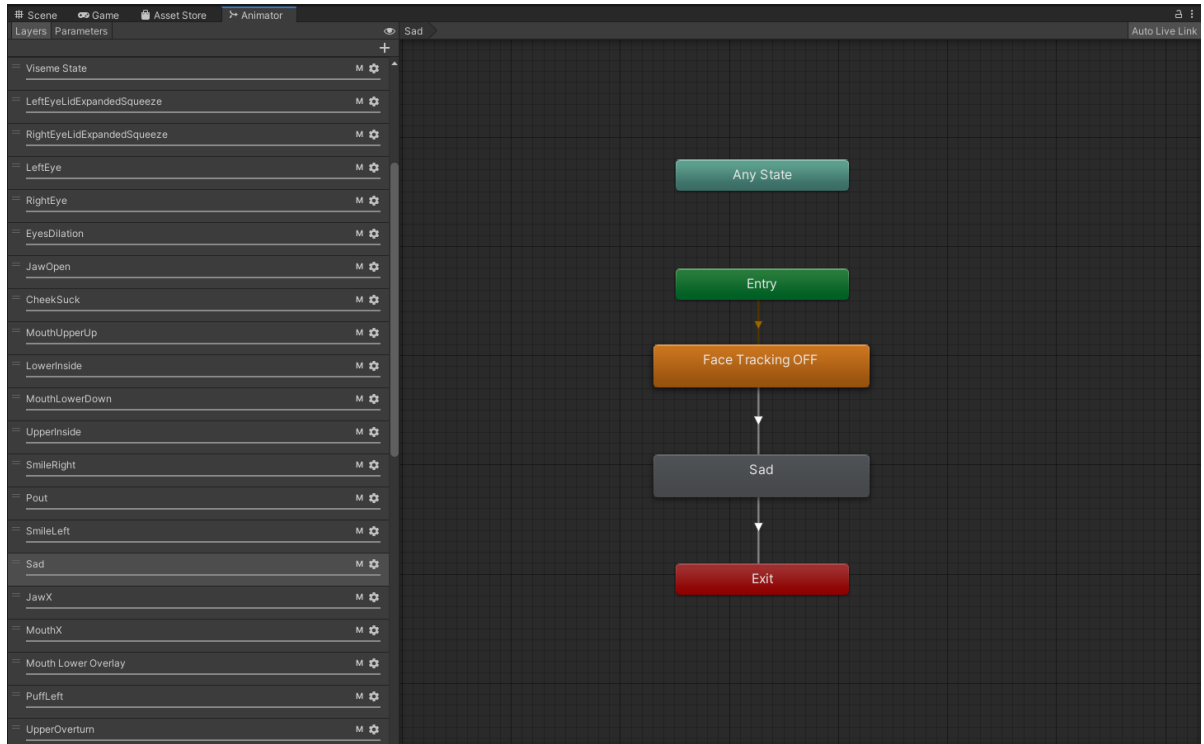Smoother parameters are in the second blend trees in the OSCmooth_Local and
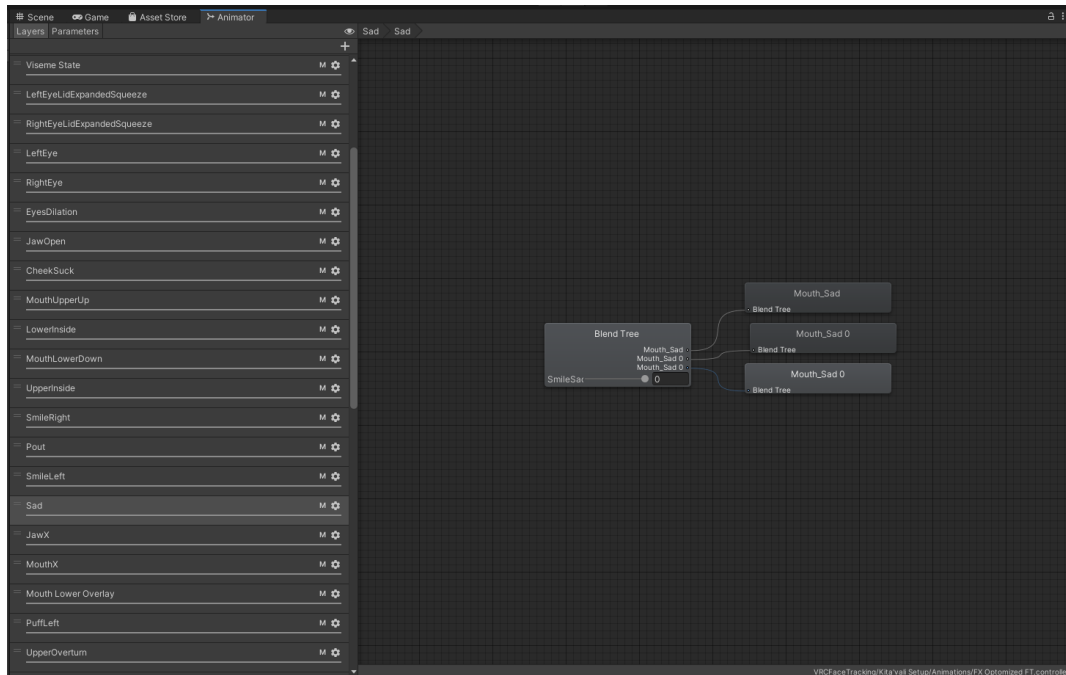
OSCmooth_Remote.
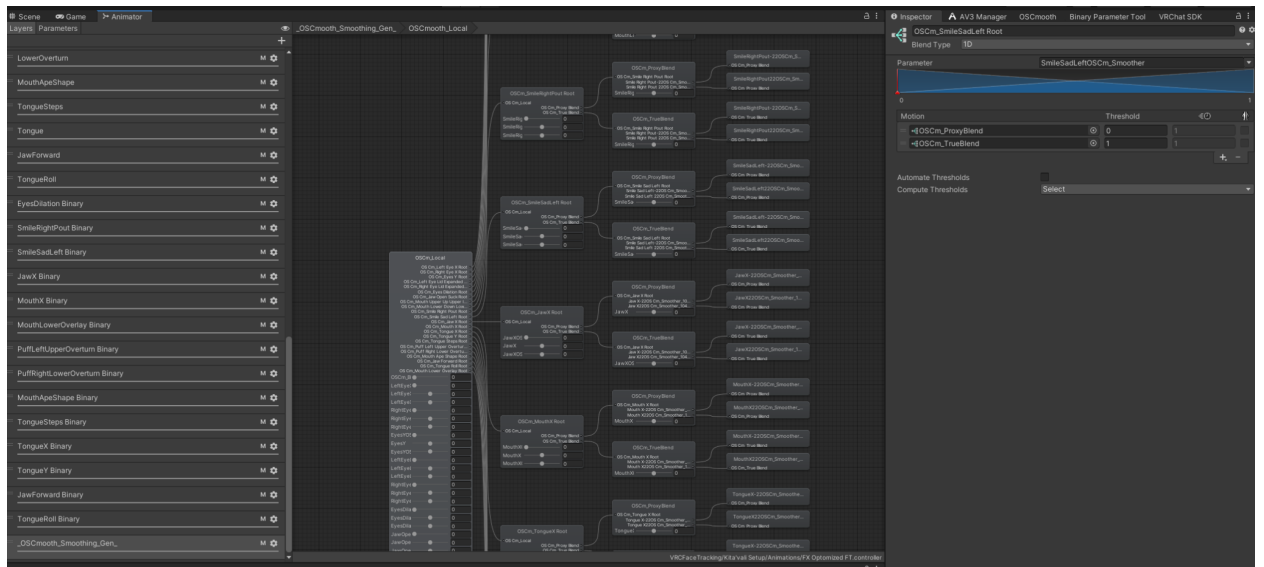
Driver Layers

These layers are used to drive the animation for each of the face tracking parameters. Each layer has an off state and a blend state.

Double clicking the blend state will go into blend tree settings.

In the inspector for the blend tree you will see settings being used in the template. The **OSCm/Proxy/** parameter is coming from the smoother layer. The thresholds can be changed as desired in these blend trees to change the sensitivity. Reducing the max threshold increases the sensitivity and adding dead zones decreases the
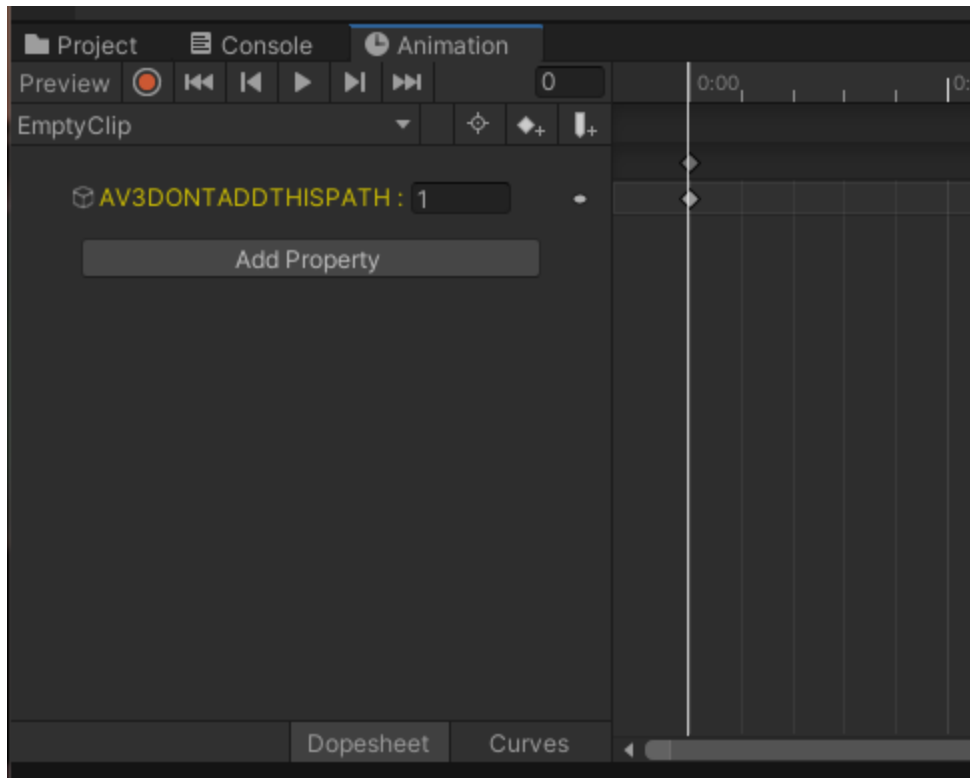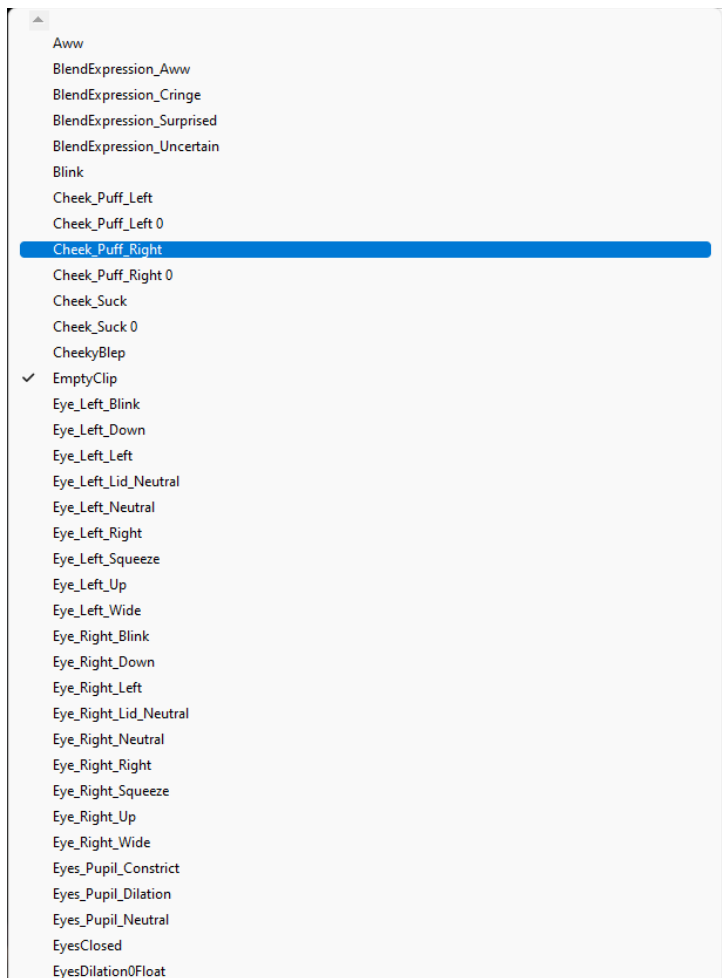
sensitivity.
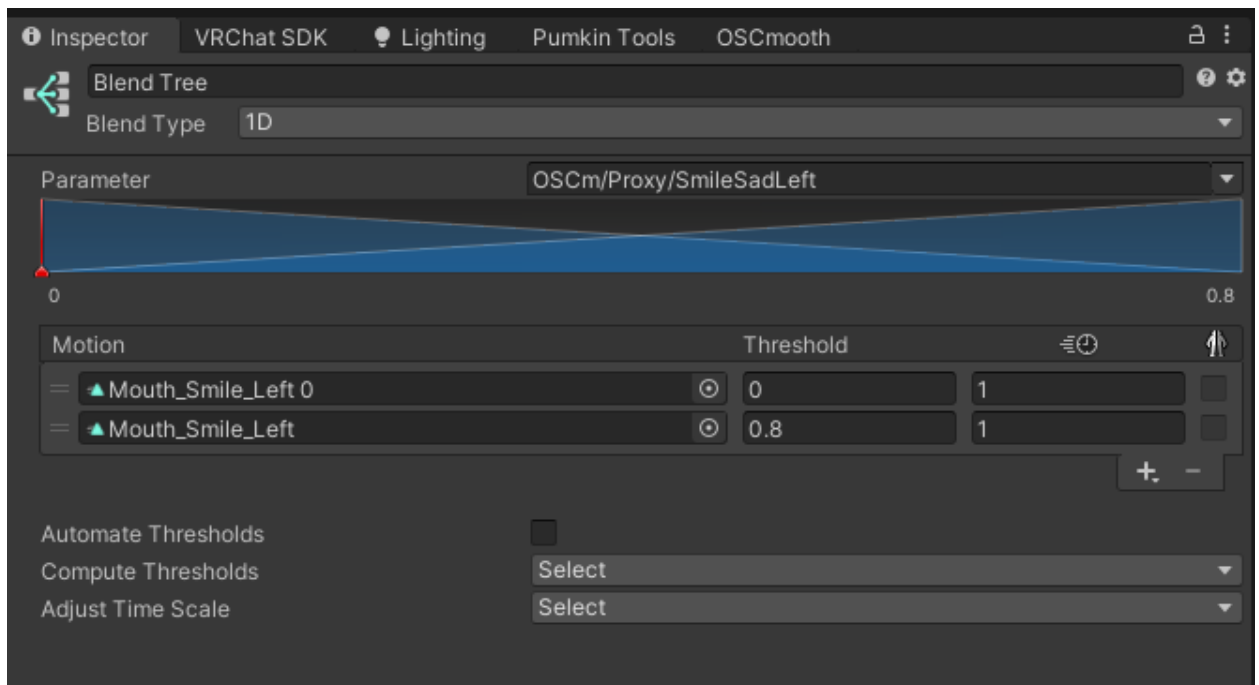
Customizing Animations

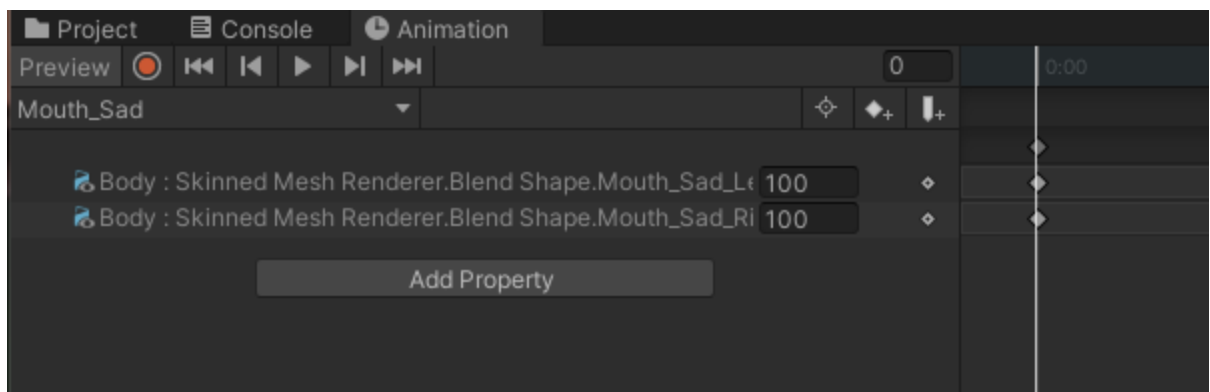☐ To customize animations for the template in play mode apply the FX controller to the avatar.
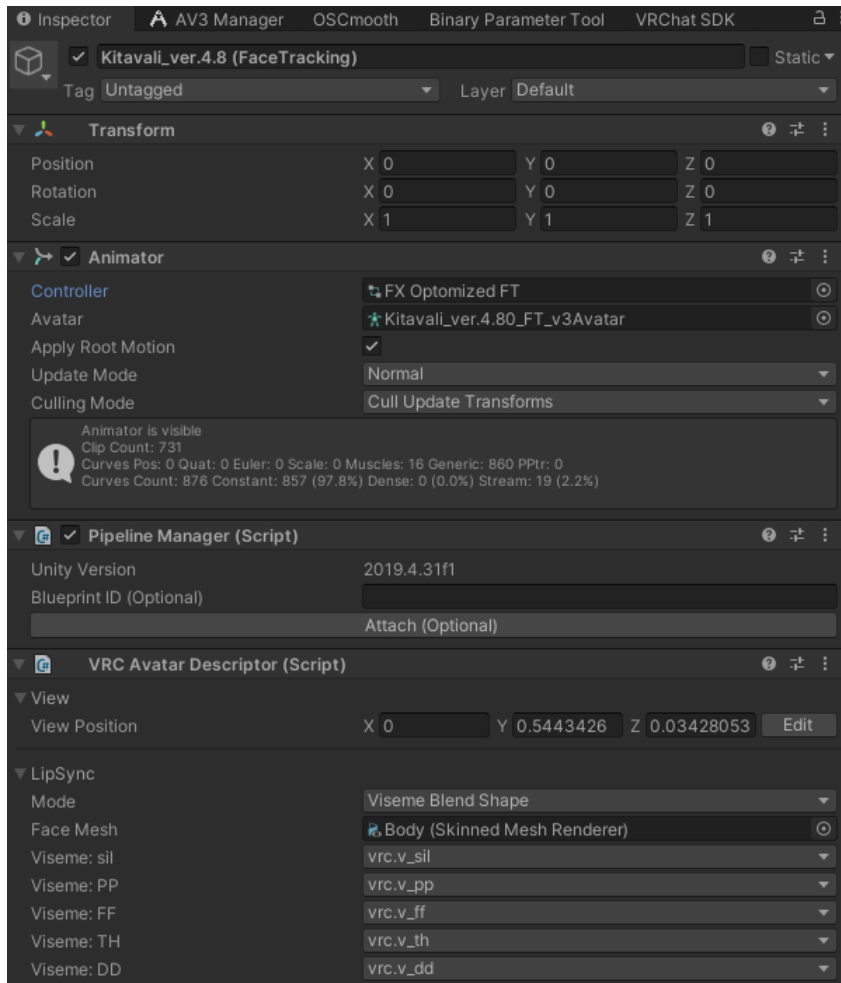
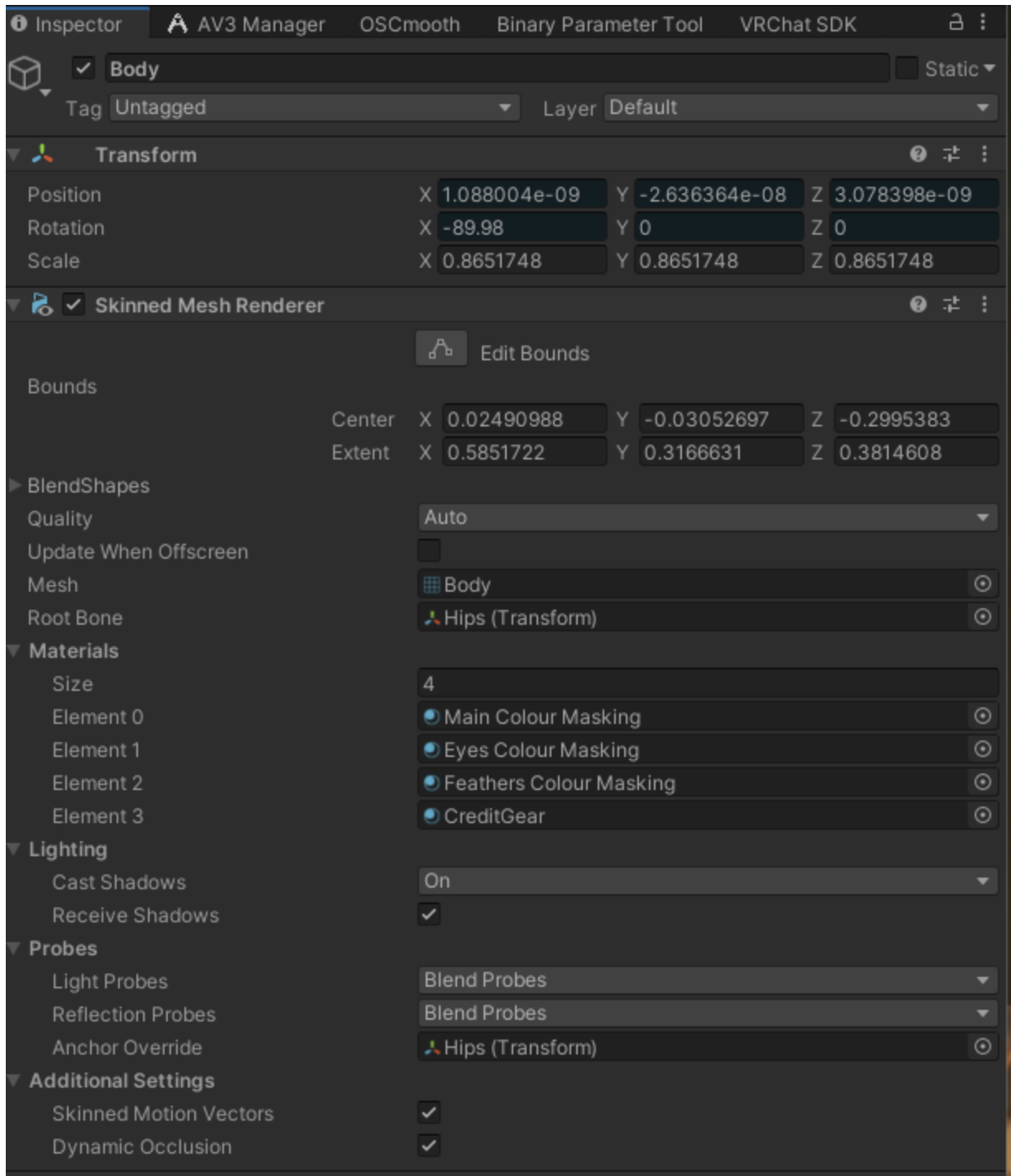☐ With the avatar selected and animation window click the drop down box.

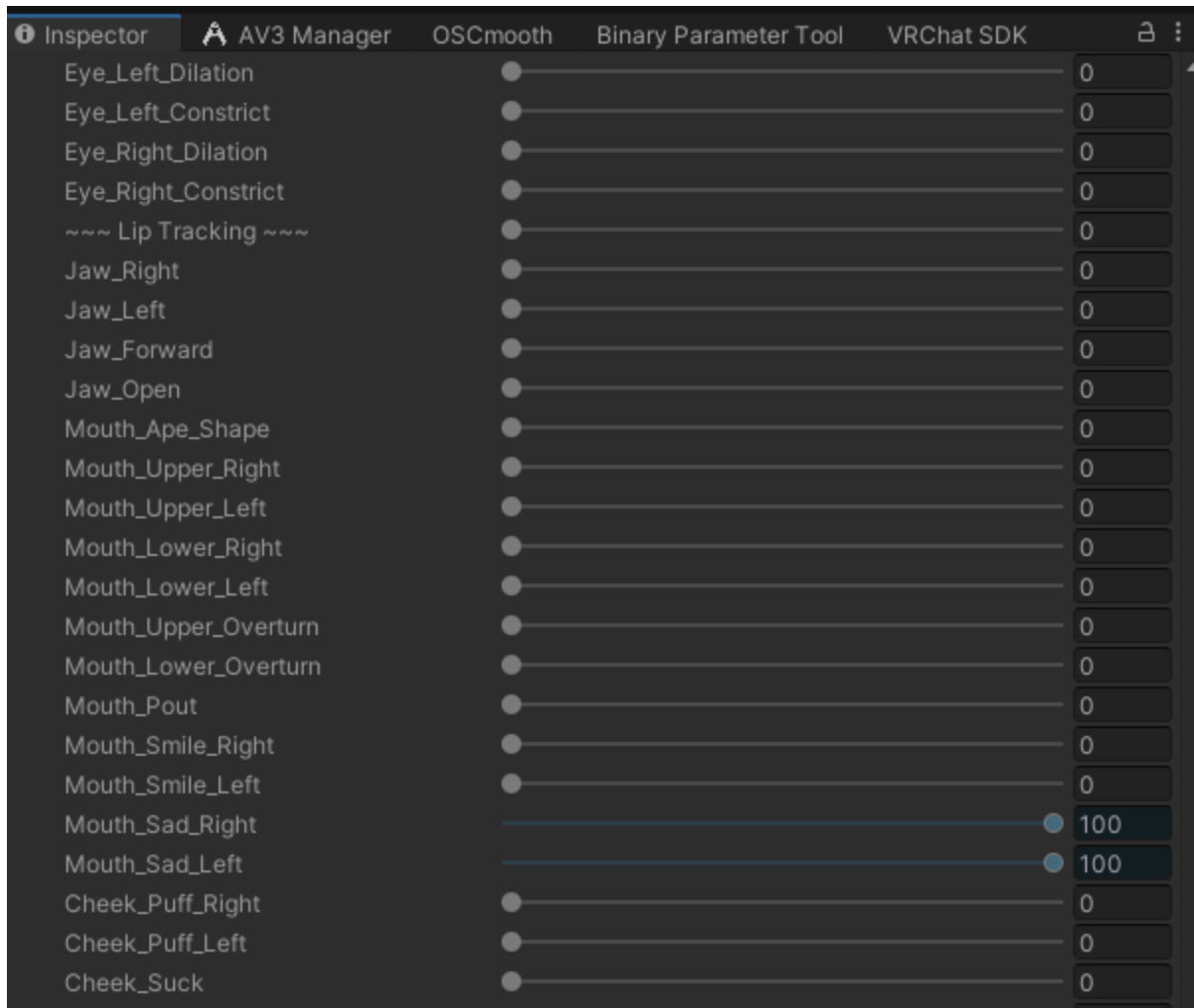You will see all the animation in the FX controller listed.

☐ Select the animation to edit and click preview. If the animations are yellow that mean the blendshape does not exist.
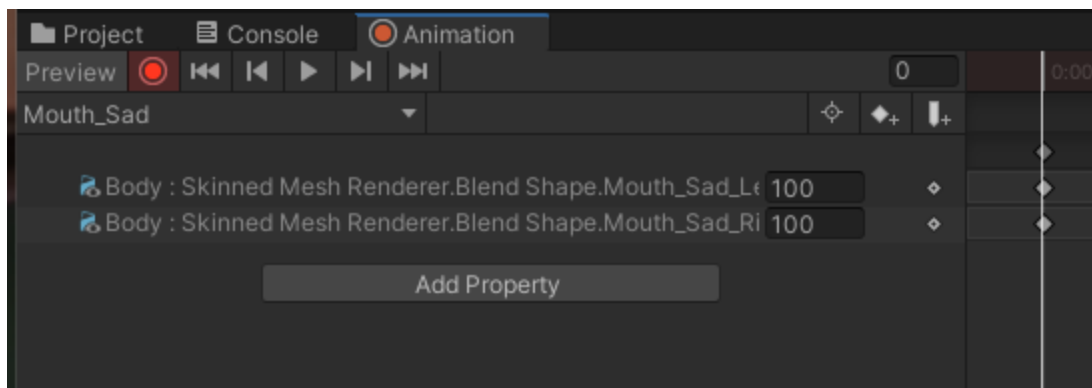
☐ Under the body mesh there is a section called **BlendShapes**, expand it.

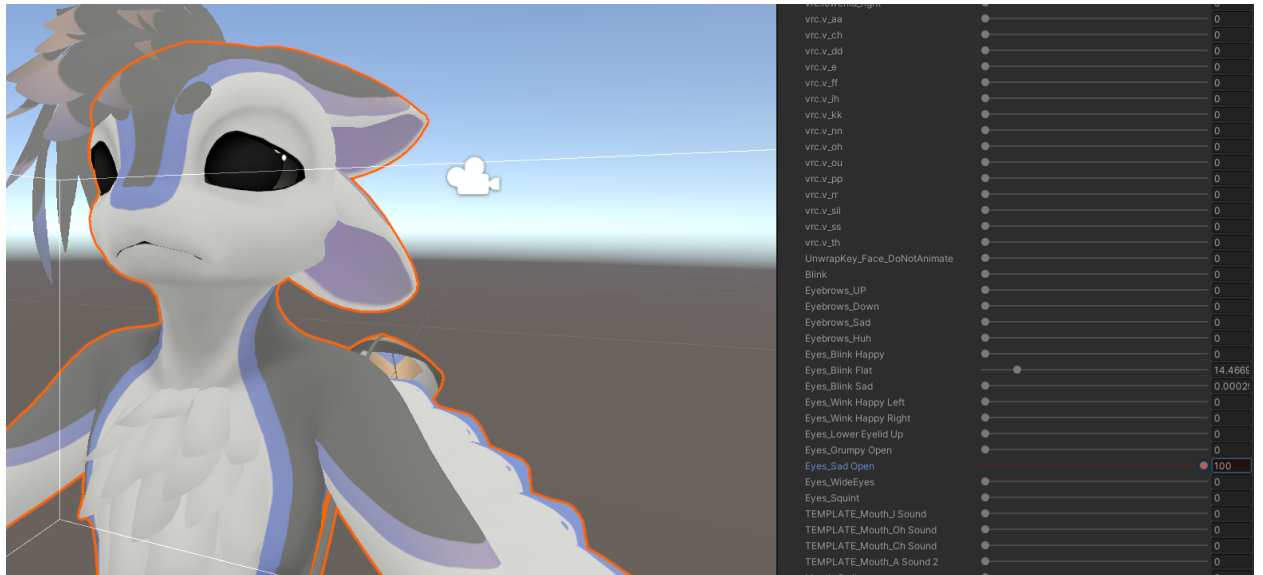☐ Scroll down to face tracking blendshapes, you should see them blue.

☐ If you want to add additional movements to the animation click the record button in the animation window.

☐ You can now record other blendshapes to add to the face tracking controlled parameter. Good pairing to the mouth is Sad to Sad Eyebrows and Mouth Lower Overlay to Angry eyebrows.

☐ Make sure to make zero state animation write defaults off. You can in record mode right click the blendshape and **Add Key** to add the zero state.