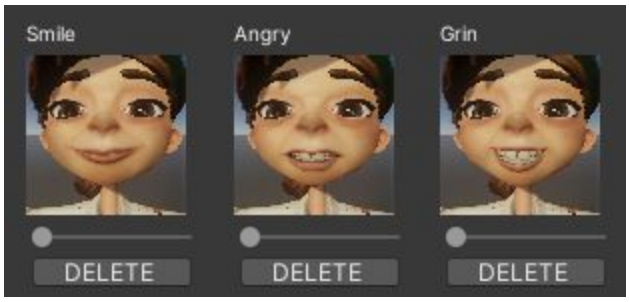
User Documentation

Introduction

PuppetFace is a suite of tools to help you animate faces in Unity.

There are currently 4 core features - Blend Shape Manager, Lip Sync, Performance Capture, and Eye Motion.

Blend Shape Manager



The blend shape manager allows you to visualise and edit and delete your blend shapes.

To use select a game object with a SkinnedMeshRenderer and Add the BlendShapeManger Component on it. (PuppetFace>BlendShapeManager)

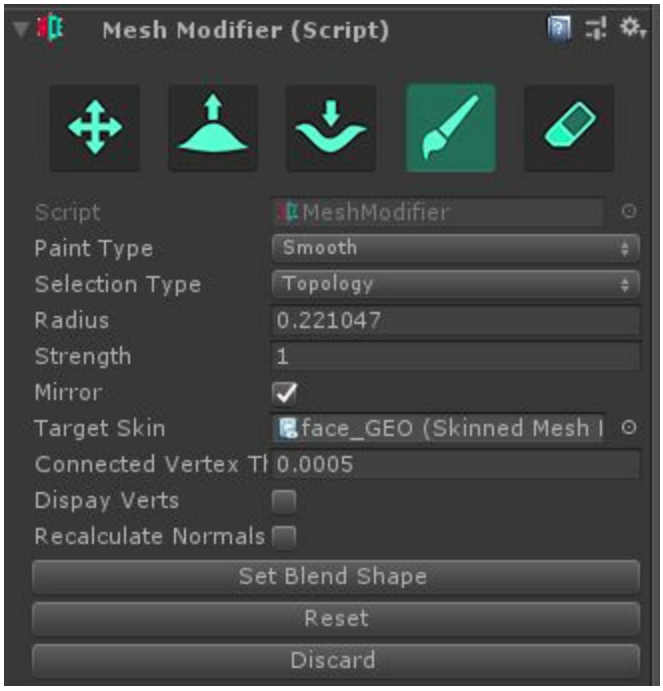
Creating & Editing Blend Shapes

You can create a new blend shape by clicking the "**CREATE NEW BLEND SHAPE**" button. It will create a blend shape model for you to edit. It will temporarily hide your current skinnedMeshRenderer.

Make sure to name the model what you want the blend shape to be called. Clicking "**Set Blend Shape**" will set it on your model and bring you back to the Blend Shape Manager.

You can edit any blend shape by clicking the image of that blend shape.
.

Sculpting Blend Shapes



The Mesh Modifier script allows you to sculpt the blend shapes in the scene view. There are 5 tools you can use:

Move Tool (W)

This moves the vertices around in the radius. You can adjust this radius by holding B and moving the mouse left and right.

You have 2 choices of **Selection Type**: **World** and **Topology**.

Topology will move all the vertices connected to the centre of your first selection. So for example if you start moving the upper lip of your mouth, the lower lip won't move with it.

World will move all the vertices within the radius of the mesh. Both the upper lip and lower lip will both move together in this mode.

Push & Pull Tools (E, R)

These tools will push the vertices out and in by their normals in the radius.
Holding Left CTRL will flip between them.

The strength value determines how strong the pushing and pulling will be.

Smooth Tool (T)

This tool will smooth out the mesh in the radius. Changing the strength will change how strong the smoothing will be.

When in other tools you can switch to this tool temporally by holding left Shift.

Erase Tool (Y)

This tool returns the vertices to the origin mesh position. Changing the strength will change how strong the erasing will be.

When in the move tool you can switch to this tool temporally by holding .left CTRL.

Managing Blend Shapes

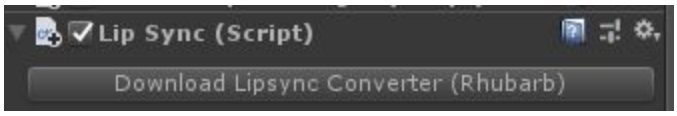
You can delete blend shapes by clicking the delete button. At any point you can re-render the icons by choosing a good view in the Scene view and clicking Render Snap Shots.

Lip Sync

The LipSync component allows you create lip sync animation from audio files, assign blend shapes and face poses (eg from bones), and fine tune the lip sync animation.

Lip Sync uses Rhubarb Phoneme extraction to generate the lip sync.

To begin, select a model with a skinnedMeshRender and add the LipSync component to it. Then click “Download Lipsync Converter (Rhubarb)”



Extract this file into the the following folder:
Assets/PuppetFace/Tools/LipSync/rhubarb/
Then click the Launch Editor button to open the Lip Sync Window.

Converting Wavs to Lip Sync

You can convert Wav files to lip sync using the “Convert Audio Files” button. Then select each of the Wav files you want to convert and press enter. Once it has finished converting click “Reload” to load the lip sync information. You can switch between different objects that have lipsync components on the top left, and next to it you can switch between the different audio clips assigned to your character.

If you have a lip sync you’ve already converted, you can load this in manually by assigning the text file to the Lip Sync FIles property in the Lip Sync Component. Make sure to also assign the corresponding wav into the Audio Clips property.

Creating & Assigning Phonemes

The next thing you want to do is create the phoneme poses. These are based on the Preston Blair phoneme convention:

Puppet Face has support for both blend shapes and bone poses - and a mix of both of them.

Only BlendShapes:

If you only have blend shapes you can simply assign the correct blend shape using the drop down

Or if you haven't got a blendshape for that pose, you can make one by clicking the image. (Make sure the blend shape name is either blank or "Not Set").
When you've finished sculpting the blend shape just click the button again to exit edit mode. You can edit the blend shape again by clicking this button.

Bones/ Bones & BlendShapes:

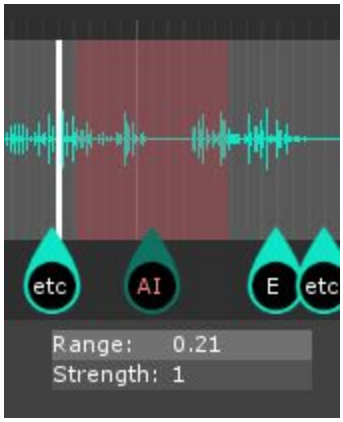
If you have any bones first assign these to the Face Bones property of the Lip Sync component. Then the first set the Rest pose. It's important to set this initially as this will form the reset pose for your face. When in edit mode for the blendshape you can also move the bones around to whatever position/rotation/scale you need. Then select the blend shape model (clicking the button once will do this), and then click on the phoneme button again to set the pose.

Editing Lip Sync Animation

The animation can be played in editor by clicking the play button:

You can manually set the time, and also scrub the timeline to play any specific part. Puppet Face supports audio scrubbing so you can hear what it sounds like at each part of the audio. To move around the audio view you can use middle mouse to slide left and right and mouse wheel to zoom in and out.

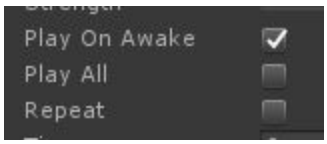
Each individual phoneme can be edited. You can select it and move it to change the timing, and you can change the range of influence of the phoneme as well as its strength:



Right clicking will allow you to either delete or add new phonemes at any point.
When you are happy with your edits make sure to click the Save button, phoneme files do not save automatically.
If you want to reset back to the original file before the most recent edits, click reload. (You will lose any changes since you last saved if you do this).

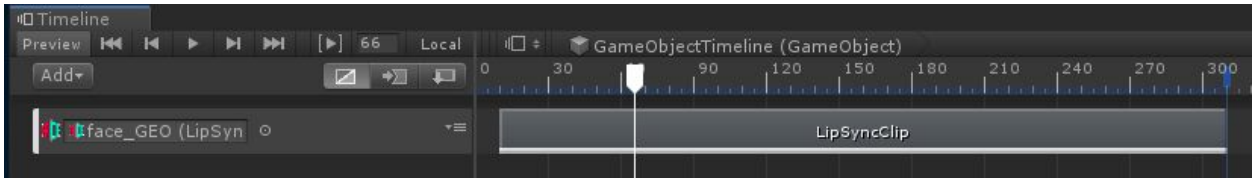
Playing Lip Sync Animation

Lip Sync animation can be played on load or called to play from a script.
To auto play make sure you have Play On Awake ticked:

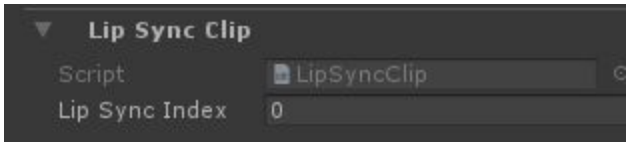


You can test your lipsync live in game by clicking the Play button:

You can play the animation on a Timeline by creating a LipSync track and then you can add lip sync clips (right click on the track):



You can change which LipSync index its using in the inspector when selecting the clip:

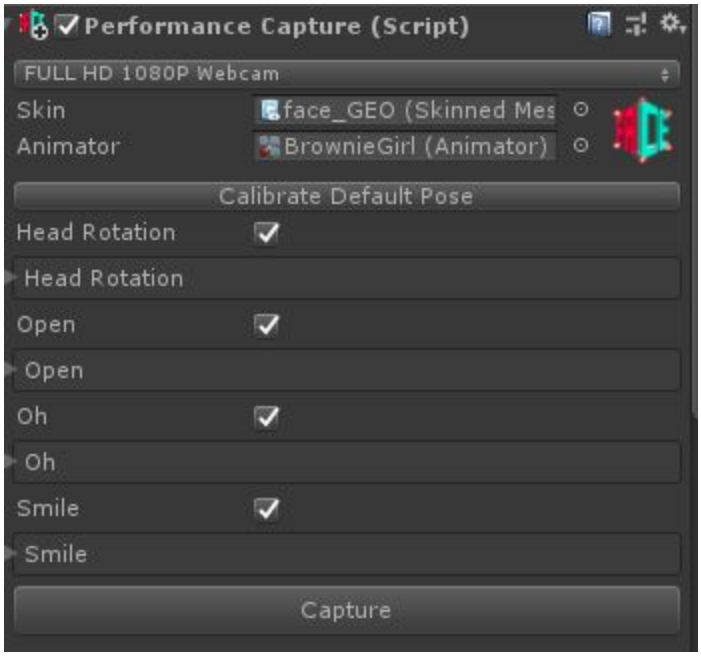


To call your animation from a script use the following:

```
using PuppetFace;
public class ExampleAnimationCall : MonoBehaviour
{
   void Start()
   {
         GetComponent<LipSync>().Play(0);
   }
}
```

The number in the play brackets corresponds to the index of the lipsync file you want to play..

Performance Capture



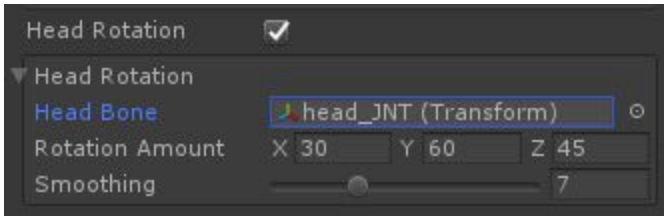
Using the performance capture component your character's face can track your face using a web camera.

To begin add the PerformanceCapture component to your character.

Make sure you have a WebCam connected - you should see it on the dropdown menu.
(NB: Make sure it's not being used by another application eg. OBS Studio or Zoom)

Assign the SkinnedMeshRenderer to the Skin property and your characters animator component to the Animator property. It needs this component to do the capturing. Make sure to have a webcam connected to your computer. You will see it has created a performance canvas - this will display the output of the webcam along with the markers it is tracking.

Head Rotation



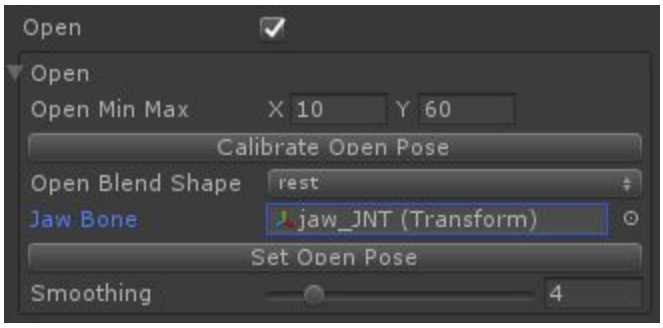
The head can copy your head movement. Make sure your head is looking straight ahead as you want the default look direction and then assign the Head Bone (or neck). If you want to change this you just need to remove and re-assign this.
The rotation amount sets how much it can rotate in either direction - X is the up/down rotation, Y is the Left/Right and Z is the tilt.

You can change how much the tracking gets smoothed over time using the Smoothing property.

Setting Mouth Shapes

Currently you can set poses for Opening the mouth, Oh shape and Smile.

Open Shape

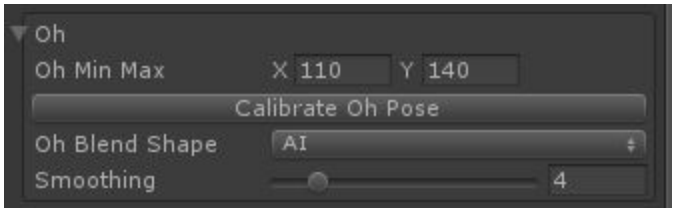


You can use set jaw bone for the opening. When you first assign it this rotation will be its closed pose. Then rotate it to the full open amount and click “Set Open Pose”.

You also can set a blend shape for the open mouth. If you don't want to also use a blend shape make sure to set it to “Not Set”. (This will change if you add new blend shapes - so make sure to update it if you do).

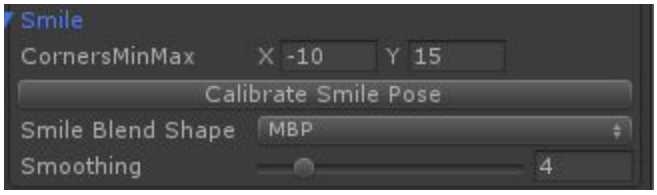
You can change how much the tracking gets smoothed over time using the Smoothing property.

Oh Shape



You can set a blend shape for the oh mouth.
You can change how much the tracking gets smoothed over time using the Smoothing property.

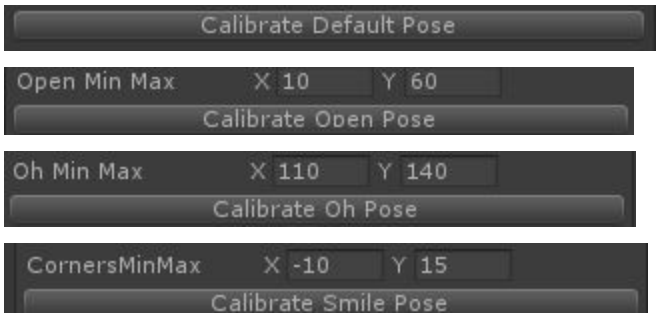
Smile Shape



You also can set a blend shape for the smile.

You can change how much the tracking gets smoothed over time using the Smoothing property.

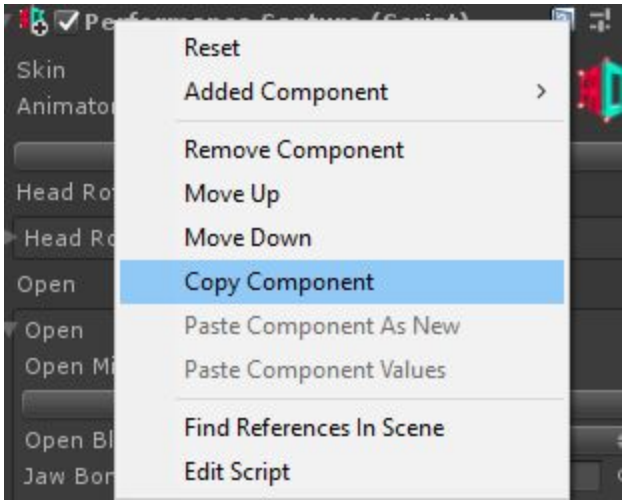
Calibration



You can further improve the tracking to your specific face by calibrating.

Calibration is done in play mode. Click play and look straight ahead at your web camera with a straight face. Hold this pose and click “Calibrate Default Pose”. After a 5-10secs turn this off. Now you can calibrate each of the other face shapes by doing the same as above with their corresponding buttons. Oh requires you to make an “ooh” sound by pursing your lips together, an open mouth requires you to open your mouth as far as you can.

Once done you need to copy these values back outside play mode. To do this first right click the PerformanceCapture component and click “Copy Component”



Then come out of play mode and instead “Paste Component Values”

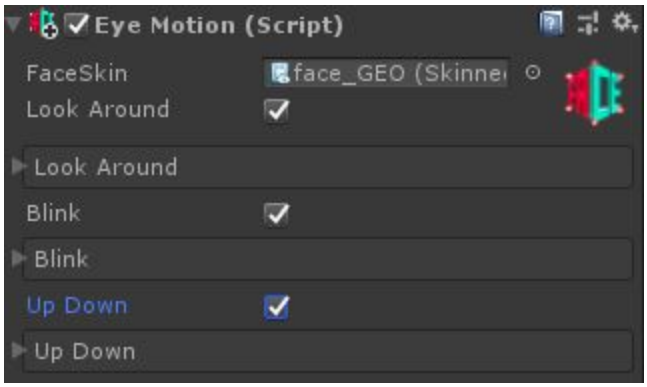
Capturing the Performance

To record your capture into an animation clip and audio clip Click the “Capture” button in play mode. Then talk/do any acting and re-click the button to stop recording.

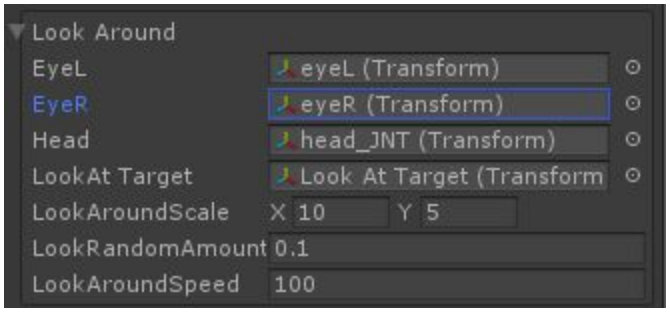
Eye Motion

The EyeMotion Component creates random eye movements and blinks.

To begin add the EyeMotion component to your character. Then either assign or click “CREATE LOOKAT TARGET” to make an object that your character will fixate on.



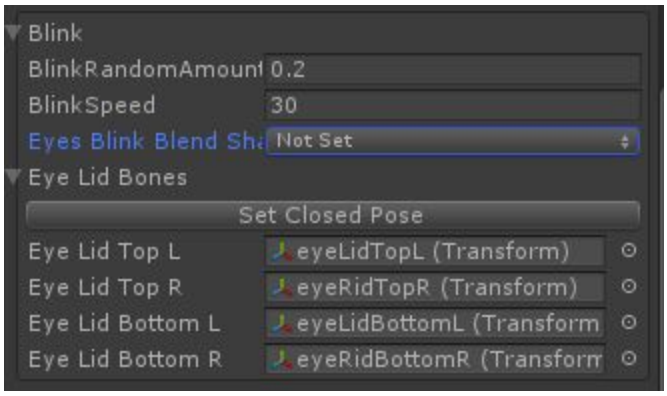
Look Around Setup



To make your character look around make sure you have first created or assigned the lookat target. Then assign the left and right eye bones for your character. You will also need to assign a head bone so it knows which way your head is facing.

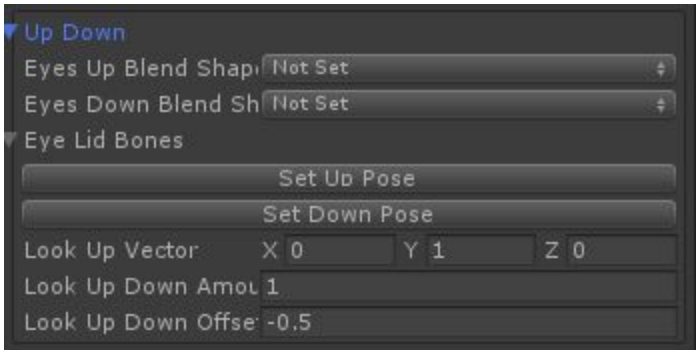
Look around scale sets how large the random eye movements should dart around.
Look Random amount sets how often the eyes will look around.
Look Around Speed will control how quick the random motions will be.

Blinking Setup



You can either use blend shapes or eyelid bones to do the blinking.
Set “Eyes Blink Blend Shape” to a blinking blendshape, if you are using bones make sure this is “not set”.
When using bones - as you assign the upper and lower eyelid bones make sure your eyes are open as you set them. Then rotate them closed and click “Set Closed Pose” to set the pose when they are closed.
Blink Random Amount sets how often the character will blink - higher values will increase how often it will happen.
Blink Speed defines how quickly each blink will be.

Eye Up and Down Setup



When eyes look up and down the eyelids will adjust correspondingly. You can use both blend shapes and bones to achieve this.
With blend shapes - set the Eyes Up blend shape so the lower eyelid is lifted up. Set the Eyes Down blend shape so the upper eyelid is down.
If you are using bones set the blend shapes to “not set”. The default rotation is set when you assign the eyelid bones. Rotate the bones into the desired lookup pose and click “Set Up Pose”. Rotate the bones into the desired lookdown pose and click “Set Down Pose”.

The Look Up Vector is the direction the eye bones will face when they look up. The look up down amount controls how far the eyelids adjust to your up down looking, and the offset is used to calibrate the centre point of the looking direction.