



[Mixamo](#) democratizes 3D character art by empowering developers and artists to bring life to their games and films. Mixamo's online platform makes character creation and animation quick, simple and affordable with its unique Auto-Rigger technology, its collection of 3D character models, thousands of animations, and revolutionary facial animation technology. Give us a try and get started for free!

## **[Fuse](#) Characters are now Face Plus compatible!**

The Autorigger can now add Face Plus-ready facial blendshapes to characters from Fuse. Just import your FBX into a Unity project with Face Plus, and animate away. Works with Fuse 1.2 or later and Face Plus 1.1.x or later.

## **Face Plus Tracking Demo Available!**

The Face Plus Tracking Demo allows you to experience the facial tracking aspects of Face Plus from a standalone Unity build. Once you log in with your Mixamo account, your 15 day trial period activates. At the end of the trial period, you will not be able to continue using the tracking demo of Face Plus. Upgrade your Mixamo account to All-Access -- information available at [mixamo.com/allaccess](https://mixamo.com/allaccess) -- to use the full version of the software and get unlimited access to our huge collection of 3D character models, animations, and our Auto-Rigging technology. The 15 days trial also applies to the full version of Face Plus.

# Face Plus Documentation

Updated: v1.1.0.2

[mixamo.com/faceplus](http://mixamo.com/faceplus)



Face Plus is available as part of the [mixamo.com/allaccess](http://mixamo.com/allaccess) yearly subscription and as a 15 days trial for users who just signed up. The Face Plus plugin for Unity enables developers to create high quality 3D facial capture and animation, in real time, directly within the **Unity game engine**. Leveraging Unity's blendshape technology and Mixamo's unique rigging and animation algorithms, Face Plus empowers game developers to be even more ambitious with storytelling and bring compelling, emotionally rich characters to life in record time, at extremely low cost. There is also a plugin for **Motionbuilder 2014** available.

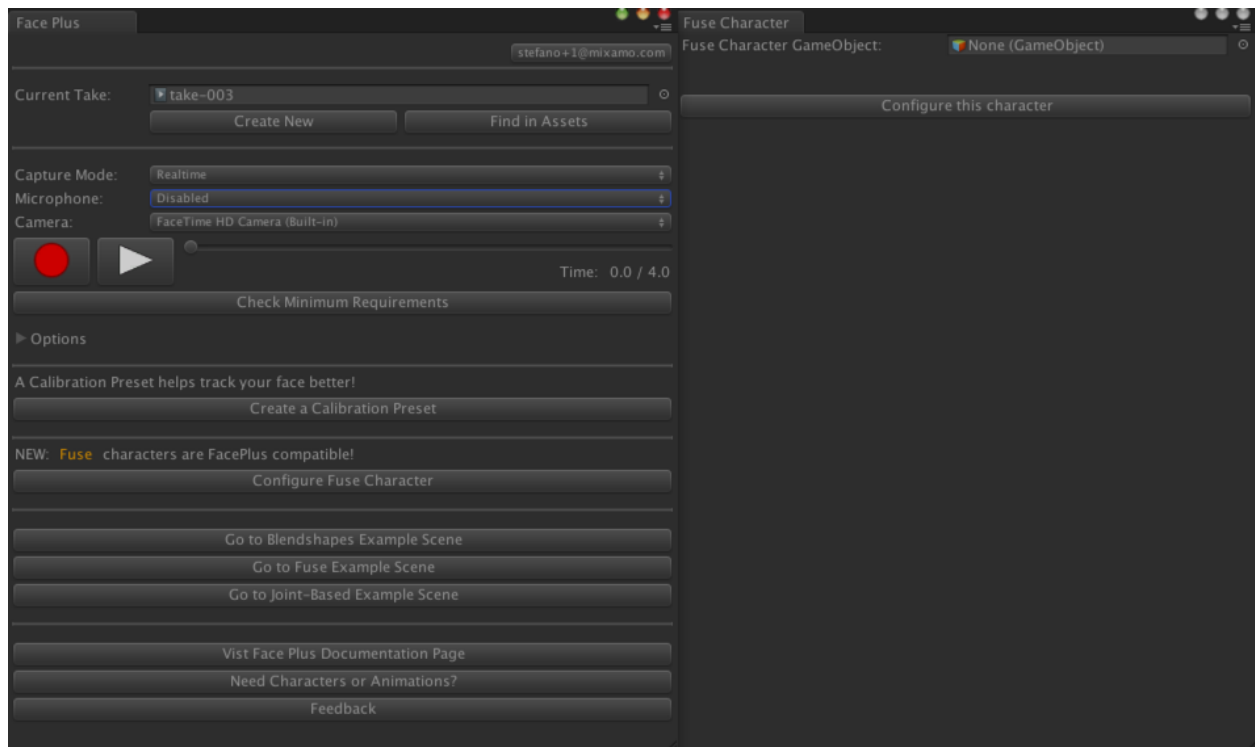
Three demo scenes are provided within the project - Examples/Example-BlendShape, Example/Example-Joint and Examples/Example-Fuse - allowing the user to try the power of Face Plus immediately. They are showing both blendshape and joint-driven rigs. Make sure you have a camera connected and check the minimum hardware requirements here: [mixamo.com/faceplus](http://mixamo.com/faceplus). The Fuse-Example scene shows a **Fuse** character automatically set up with Face Plus. Fuse 1.2 or later is required to get a full facial rig with blendshapes.

Face Plus is designed to leverage the introduction of blendshape support in Unity 4.3. Face Plus supports Unity 4.2 or later. Unity 4.2 rigs must use joints to animate the character's facial features, as in the Example-Joint scene. Note that you cannot presently record joint-driven rigs. With Unity 4.3 or later, you can use blendshapes, as in the Example-BlendShape scene, and all features are supported. The character - Battery Boy - provided with the demo project is part of the *Unplugged* project and is distributed for commercial and non-commercial use under the [Apache 2.0 license](http://www.apache.org/licenses/LICENSE-2.0). By using Face Plus you accept the terms of service listed below in the licensing section.

Face Plus works with Windows 7 or later and Mac OS X 10.9 or later. Best results are obtained with high end graphic cards (GPUs), specifically AMD/ATI graphic cards.

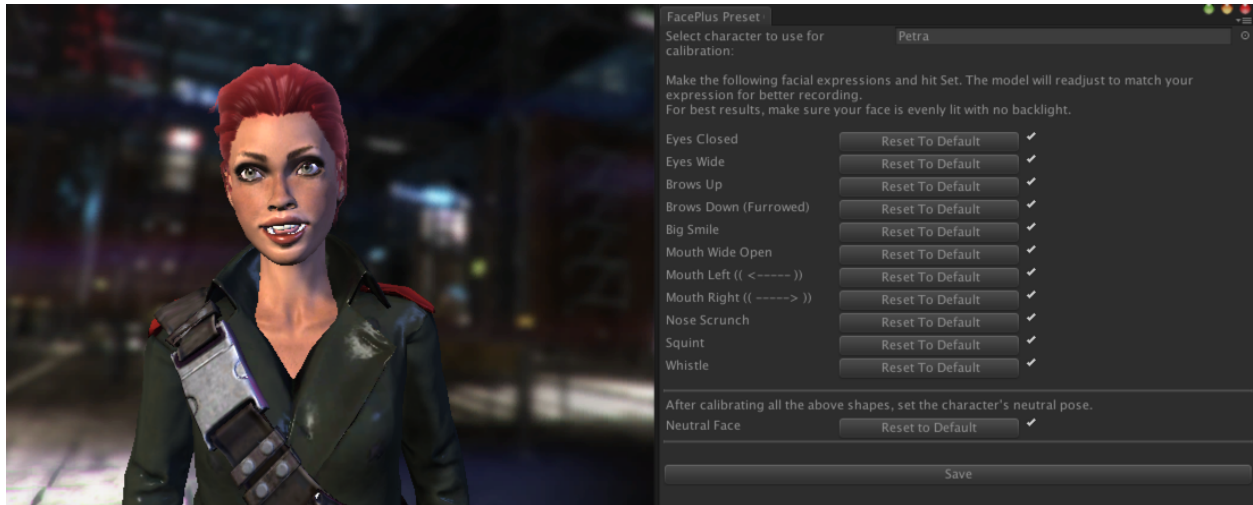
## Workflow with Fuse Characters

With Face Plus version 1.1.x and later and Fuse 1.2 and later you can create Fuse characters complete with facial rigs and connect them automatically to Face Plus with a single click. In the new UI (below) you can see the “Configure Fuse Character” button. If you drag and drop your Fuse character from the scene/hierarchy tab into the “Fuse Character GameObject” slot, and click the “Configure this character” button, the Fuse character will be automatically set up.



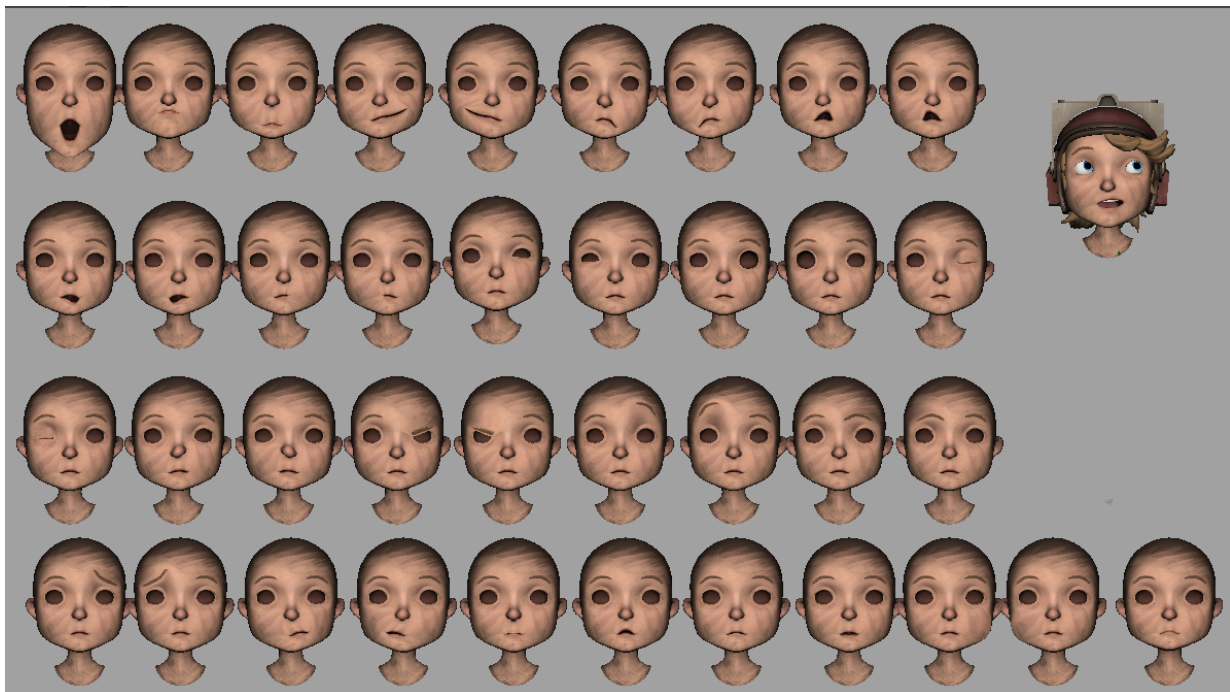
## Calibrate the performer to your character

With Face Plus version 1.1.x and later we have added a functionality to tailor the expressiveness of your character to the performer. Clicking on “Create a Calibration Preset” opens a window where you can assign the character you want to use (from the scene/hierarchy tab). There are a set of facial expressions the performer has to hit, clicking “Set” for each expression. The calibration is effective **ONLY IF ALL EXPRESSIONS ARE SET**. You can then save your preset for future use. Make sure you specify both the name of the performer and the name of the character as the preset is a function of both.



## Creating a set of Blendshapes from scratch - Mixamo Face Rig

One option to automatically create a set of Face Plus compatible facial blendshapes for your character is to import it into Fuse. In the Auto-Rigging process the blendshapes will be created automatically. For more information on how to import your character into Fuse see the [Fuse import documentation](#). If you want to create a set of blendshapes from scratch for your character, below are the steps. First we would need to create **morph targets**, or **blendshapes**, for our character's face.

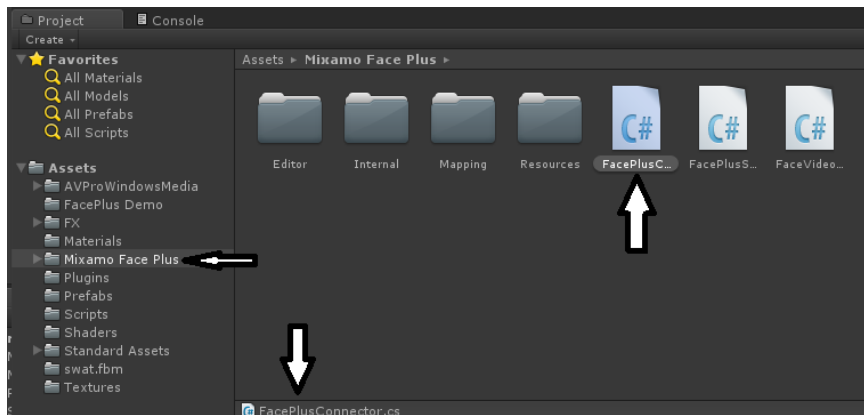


Mixamo has provides a list of required **blendshapes** needed along with their naming convention, in the **Mixamo Face Rig** portion of this document.

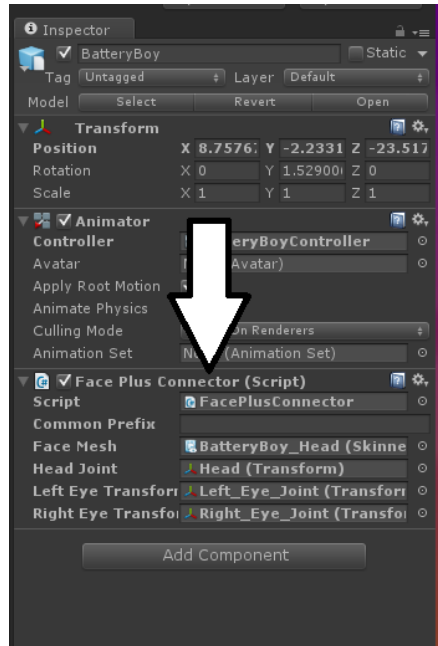
We can also refer to the Battery Boy character in this project, located here:  
Assets\Mixamo Face Plus\Examples\Character\Rigs\BatteryBoy.fbx

Once you have created or obtained your character containing the required blendshapes, you can follow these steps to set up your character for facial capture:

- Export the character as an **FBX** before importing into **Unity 4.3** or later.
- Open **Unity 4.3** or later (either creating a new project or add to existing)
- Import the character to the Assets
- Drag the character into the scene
- Find the **FacePlusConnector.cs** script in the **Mixamo Face Plus** folder under Assets

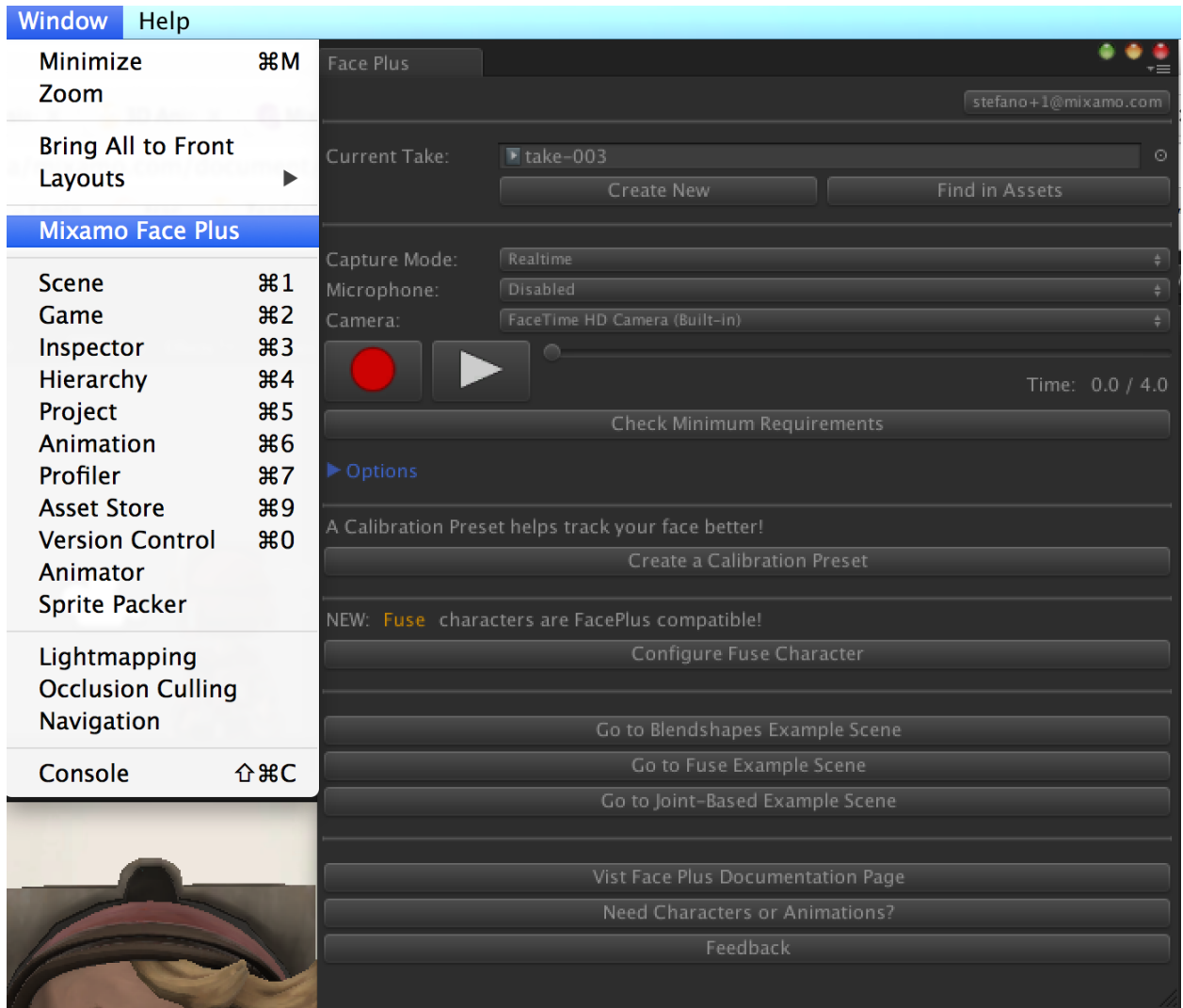


- Add the script as a component to the character
  - Select the character so it shows in the Inspector
  - Drag the Script onto the character in the Inspector
  - Drag into the component the required connections
    - Face Mesh
    - Head Joint
    - Left Eye Transform
    - Right Eye Transform



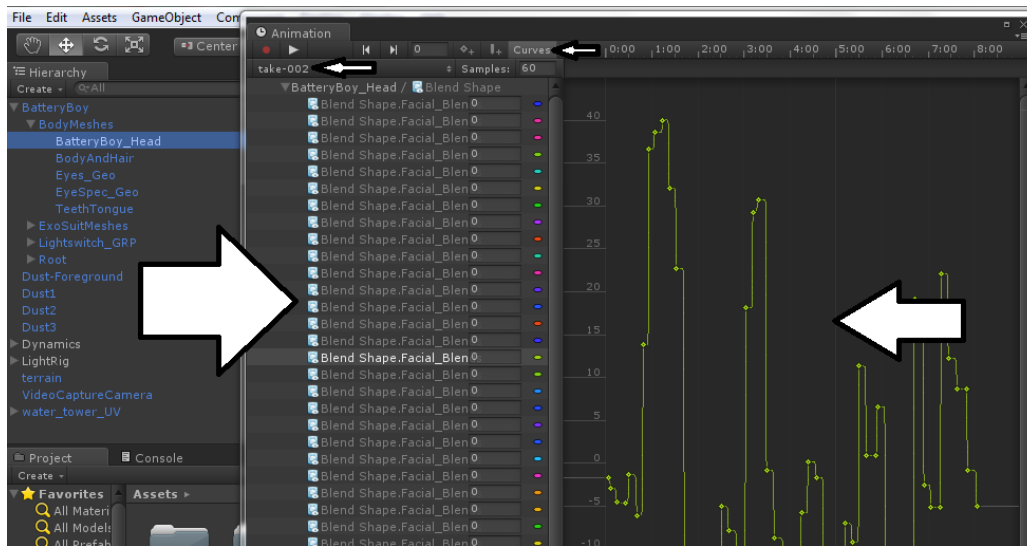
## Using Face Plus to record facial animation

- Open **Window > Mixamo Face Plus** and login
- Press **Play** in the **Scene**



- We are now looking at the **Face Plus** UI and ready to start
- The large red button is the **Record** button. While recording, this button becomes **Stop**.
- After pressing **Stop** the first time, we will be prompted to save the **Take** as a **.anim** file, this will become the Current Take.
- Press **Play** to review the captured facial animation.
  - If we like it, we are ready to move on
  - To capture again and overwrite, just hit **Record** again, and you will be prompted to overwrite your current take (this prompt can be disabled in the **Options**)
- Once satisfied, we will now move onto looking at and tweaking the animation curves.
- Find the new take created in the **Assets** folder. To help with this, we created a button called **Find in Project** next to the **Create New** button in the **Face Plus** UI.
- Open the **Animator** window (**Window > Animator**)

- Select the **Face** layer on the BatteryBoyController **Animator**.
- Drag the Take into the **Animator** window.
- Right click, and select **"Set As Default"**
- We can now press Unity's **Play** button to preview our new Scene.
- To view and edit the blendshape curves, open **Window > Animation**.
- Switch the Take to the facial Take just created.
- Select any blendshape.
- Click the **Curves** button to view the animation curves of a blendshape.
- Zoom in to view the curves. Here, we can drag, tweak and delete the keys to modify the animation of the captured facial data.



- From here, we can now edit, preview, and repeat until we are satisfied.
- Enjoy Face Plus!

## Manually Tweaking Facial Capture (try Calibration first!)

You can adjust the gain and offset of the signals returned from Face Plus by attaching a **FacePlusShaper** to your character. You can attach an existing preset (**JSON** text file) to the **Preset** field, or enter "Play" mode to create one. Tweak the gain and offset for each blend shape channel to your liking. Values range from 0-100. A gain of 100, and offset of 0 is the default for each blendshape. Once satisfied, click "Save" in the FacePlusShaper inspector. You will be prompted to provide a location to save the file. To begin using your preset file for all your captures, simply exit play mode, and attach your new preset file to the FacePlusShaper script's Preset field, and save your scene.



# Mixamo Face Rig: A Blendshape Standard

With the Mixamo Face Rig, we are trying to establish a standard in the industry for blendshape driven facial animation. We have worked with top rigging experts in games and film to come up with a complete set of blendshapes to encompass the full range of human expression.

The following is a list of blendshape names that can automatically plug in to Face Plus:

- **Mouth/Jaw**

- MouthOpen
- MouthUp
- MouthDown
- Smile\_Left
- Smile\_Right
- Frown\_Left
- Frown\_Right
- UpperLipUp\_Left
- UpperLipUp\_Right
- LowerLipDown\_Left
- LowerLipDown\_Right
- MouthNarrow\_Left
- MouthNarrow\_Right
- MouthWhistle\_NarrowAdjust\_Left (*optional*. A corrective shape to turn an ordinary mouth narrow into a pucker/whistle)
- MouthWhistle\_NarrowAdjust\_Right (*optional*. A corrective shape to turn an ordinary mouth narrow into a pucker/whistle)
- Midmouth\_Left (for practical purposes, mouth left)
- Midmouth\_Right (for practical purposes, mouth right)
- Jaw\_RotateY\_Left
- Jaw\_RotateY\_Right

- **Eyes/Brows/Nose**

- Squint\_Left
- Squint\_Right
- EyesWide\_Left
- EyesWide\_Right
- Blink\_Left
- Blink\_Right

- NoseScrunch\_Left
- NoseScrunch\_Right
- BrowsDown\_Left
- BrowsDown\_Right
- BrowsUp\_Left
- BrowsUp\_Right
- BrowsIn\_Left
- BrowsIn\_Right
- BrowsOuterLower\_Left
- BrowsOuterLower\_Right

## Driven Joints

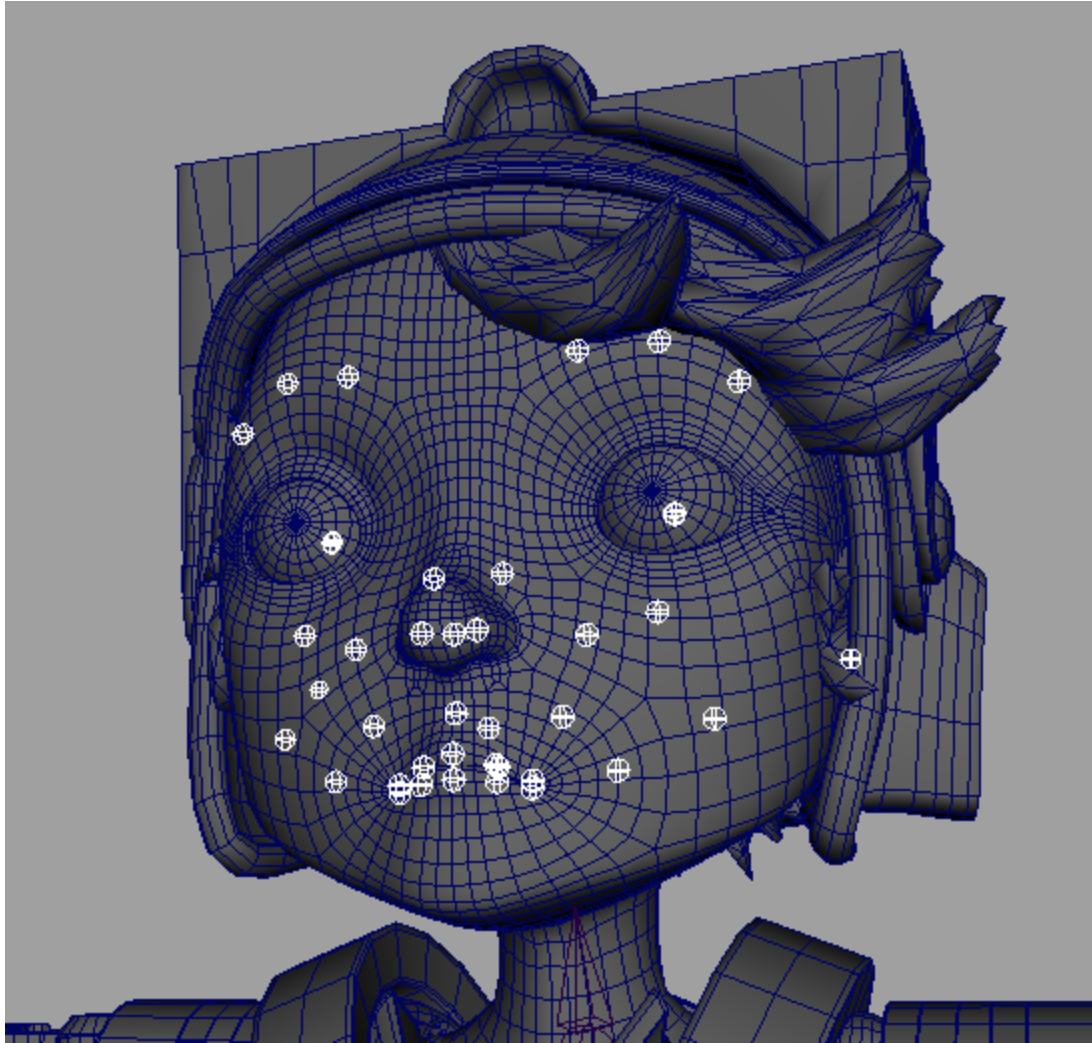
- Head\_Joint (base of the head)
- Left\_Eye\_Joint
- Right\_Eye\_Joint
- Jaw\_Joint (*optional* in case user does not want to use blendshapes for the jaw)

## Suggested Other Blendshapes for Keyframing

These Blendshapes can hook into additional Face Plus scripts but will not be driven by the solver directly.

- **Mouth/Jaw**
  - UpperLipIn
  - UpperLipOut
  - LowerLipIn
  - LowerLipOut
  - CheekPuff\_Left
  - CheekPuff\_Right
  - JawForeward
  - JawBackward
  - JawRotateZ\_Left
  - JawRotateZ\_Right
  - Jaw\_Up
  - Jaw\_Down
  - Jaw\_Left
  - Jaw\_Right

## Creating a Face Plus Compatible Joint Rig



### The Basics

You will create your facial joint rig just like you always do. Face Plus does not care how many joints you use or what they are named. It will, however, be your responsibility to tell the system what "MouthOpen" or "Smile\_Left" means for your rig. Joint Based Rigs for Face Plus require a way to map values from the plugin to deltas for moving the joints.

The current implementation in the example Unity Face Plus scene needs a text file in

JSON format describing:

- the delta (change) in translation (labeled as "dtx","dty","dtz"),
- rotation (labeled as "drx","dry","drz"),
- and scale (labeled as "dsx","dsy","dsz"),

for each joint on the face rig for each Face Plus channel

## JSON File Organization

JSON is a simple format that most languages can output readily from a dictionary. In Python, for example, after building a dictionary of the target values, it is as simple as using this three line function:

```
import os, json

def exportJSON(dict, path):

    f=open( os.path.join(path,"SDK_Preset.txt"), 'w')

    f.write( json.dumps(dict, sort_keys=True, indent=2, separators=(',', ': ')) )

    f.close()
```

The organization of the JSON file is as follows:

```
{
  "FacePlusChannel":
  {
    "joint1":
    {
      "dtx": 0.81260239754446828
    },
    "joint2":
    {
      "dtx": 0.81260239754446828
    }
  },
  "FacePlusChannel2":
  {
    "joint1": {},
    "joint2":
```

```

{
  "drx": 0.068981552327341433,
  "dtx": -1.2831292072035581
}
}
}

```

Maya users can use the python script included in the Face Plus download to easily create this file.

## Setting up SDKs in Maya and exporting the JSON file

- In Maya, open the scene with your joint-based facial rig
- Import in FacePlusTransformNode.fbx

\*If you already have a node with all the SDKs on it, just make sure the attributes are named according to Face Plus channels (MouthUp, MouthOpen, etc)

- Create set driven keys for the channels you want Face Plus to control (Animation Tab -> Animate -> Set Driven Key -> Set) see the Maya documentation for more on Set Driven Keys
- run the script
- point it to a folder to export to and the Facial\_Hookup node that you put the SDKs on
- Press the Export button

## Hooking up a joint based facial rig in Unity

- In Unity, make sure your character has the Face Plus Connector script applied
- Drop in your Head and Eye joint transforms into the appropriate places
- change the Type to Joint\_SDK
- the exported file (will be called SDK\_Preset.txt) can be dropped into the SDK Preset slot
- you will need to populate the Face Joints list with the joints referenced in the SDK Preset file

## Troubleshooting

Make sure your drivers are up-to-date. Mixamo Face Plus requires at least OpenCL 1.1. If you are unsure whether your drivers are up-to-date, please try updating them.

## Links

For more information, help, and tutorials, you can visit the following links:

- [Mixamo](#)
- [Face Plus](#)
- [Unplugged](#)
- [Mixamo Help](#)

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