

Puppet 2D – User Documentation

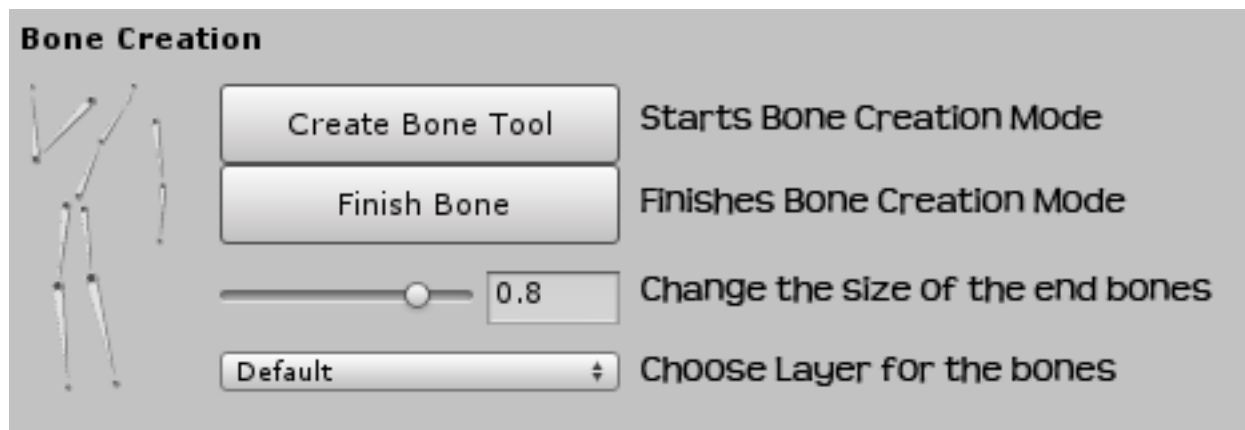
Introduction

Puppet2D is a tool for Unity3D that allows you to quickly set-up your 2D character for animating. With this tool you can create 2D skeletons, skin your characters to the bones, and create really easy to use controls that make animating the characters a breeze.

To bring up the Puppet2D window, select the Puppet2D menu and go to Window>Puppet2DWindow. All the creation tools are contained in this window.

To begin creating your puppet you'll want to get your character ready to be “rigged”. In Unity go into the scene view and click the 2D button at the top of the view. Drag in your 2D character sprites and put them into a locked layer. This is useful so you don't end up accidentally clicking on it when your trying to draw bones or controls. Now your ready to start creating the bones.

Bone Creation



Bones are the pivots that will control how your puppet moves.

To start creating a bone click the “Create Bone Tool” button. This sets you in *bone creation mode*. You will remain in this mode until you press enter or click the “Finish Bone” Button.

In the 2D View start left clicking and you will start drawing bones. Each bone will be parented to whatever you have selected.

Create Bone Tool Button – start creating bones

Left Click – draw bones

Backspace – delete selected bone

Hold Shift – move selected bone only

Hold Ctrl – move selected bone and its children

Alt Left Click – Insert Bone between selected bone and its children

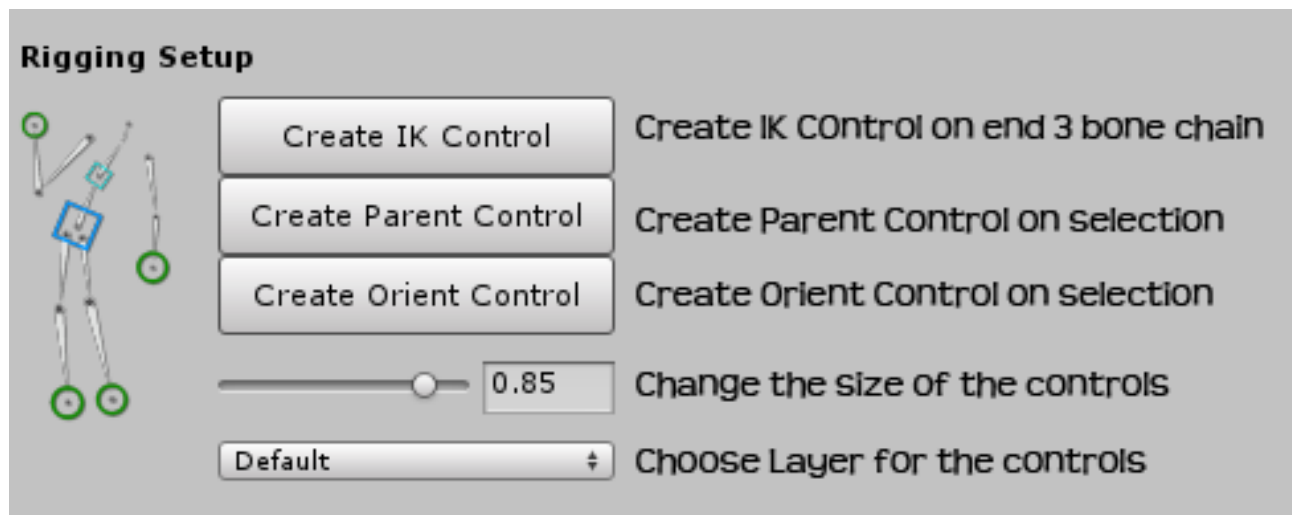
Right Click – Deselect bones

Press Enter/Click “Finish Bone” - Finishes creating bones.

The bone sizes are scaled based on the distance between them. The end joints can be resized using the slider.

In the drop down menu at the bottom of bone creation mode you can choose which sorting layer to put the bones on. It is a good idea to have a “Bone” Sorting Layer so you can keep it visually in front of the character.

Rigging Setup



Although its possible to animate your characters just by rotating the joints directly, this can be a tricky way to animated, particularly when it comes to keeping the feet on the ground. Creating some custom controls for your character with Puppet2D is a very quick process, and really makes the job of animating more intuitive and easy.

Global Control

When you first create a control you will see a gloabl_ctrl also get created in the hierachy. This is the base from which all the control scripts get executed. Turning the script on this off will disable all the controls. You will want to add all your animations on this gameObject and move it to move your character around.

Start Rotation Y – allows you to change the y axis plane of your character

IK handles – all the Ik handles for this character (in execution order)

Parent Controls – all the Parent & Orient for this character (in execution order)

Control Visibility – Turns controls visibility on and off

Bones Visibility - This will toggle visibility of all bones parented to this global_Ctrl (make sure u press the refresh button the first time you parent the bone)

Combine Meshes – This Combines all the meshes that share a texture into one mesh (so 1 draw call)

Flip – use this to flip the character in the x-axis

Auto Refresh – auto orders the execution order of the controls

Refresh Global Control – click this when you change something in the rig – such as delete a control or change the hierarchy in some way.

You can flip the character in the x axis by using the flip checkbox.

IK Controls

Are controls you need for any of your characters limbs (IE arms or legs). This gives you a single

end control which you can use to animated their limb. It will mean your feet will stay on the ground when you move its body.

To create an IK control, select the end of a three bone chain and click the “Create IK Control” Button. For example if you have leg which has bones such as thighBone>kneeBone>footBone. Select the footBone and click the button.

You can flip which way the knee (or elbow) faces by clicking the “flip” check box in the inspector. This can also be animated.

If you want you can have “stretchy limbs” by clicking the “Squash and Stretch” check box.

Parent & Orient Controls

A problem with animating bones directly is that they start from awkward rotations and positions. This means you cant quickly reset them by zeroing them. Puppet2D allows you to create controls that are easier to select and start out at zero position and rotation, so can be easily reset. Parent controls affect the position and rotation, orient controls affect only the rotation.

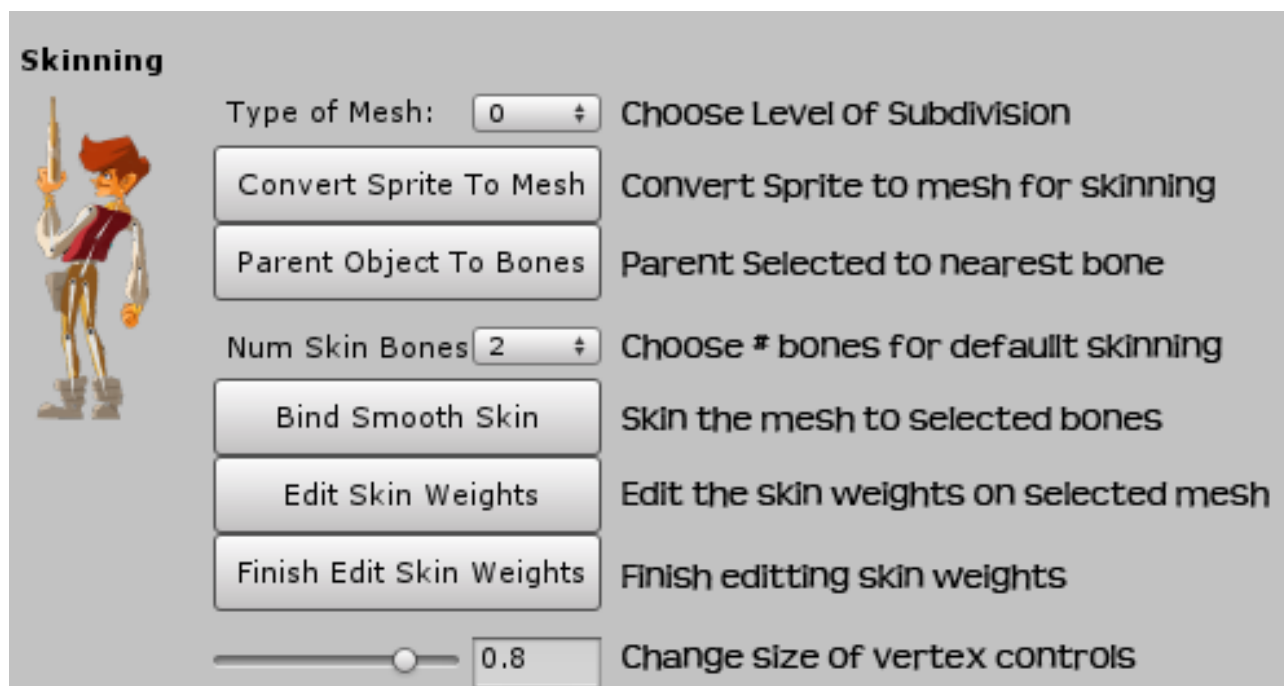
To create a parent control select a bone to control and click “Create Parent Control”

To create a orient control select a bone to control and click “Create Orient Control”

You can resize the controls in your scene by moving the slider to the desired scale.

In the drop down menu at the bottom of rigging setup you can choose which sorting layer to put the controls on. It is a good idea to have a “Control” Sorting Layer so you can keep it visually in front of the character and the Bones.

Skinning



There are two ways to get the bones to influence your sprites; by parenting them or by skinning them.

Parenting

You could manually parent your sprites to the bones, but to speed this job up Puppet2D has a button that does all of your object in one go. Select all the bones and all the sprites/objects and click

“Parent Object to bones”. This will parent all your objects to the nearest bones.

Skinning

Skinning allows single objects to be influenced by more than one bone. In order to do this the sprites need to be converted to a mesh.

To do this select your sprite (make sure its not parented) and click “Convert Sprite To Mesh”. You can choose how subdivided you want the mesh to be from the “Type of Mesh” dropdown menu.

You can change the number of vertices in the mesh by first adding a polygon2Dcollider component to the sprite. You can use this to remove and add vertices before converting it to a mesh.

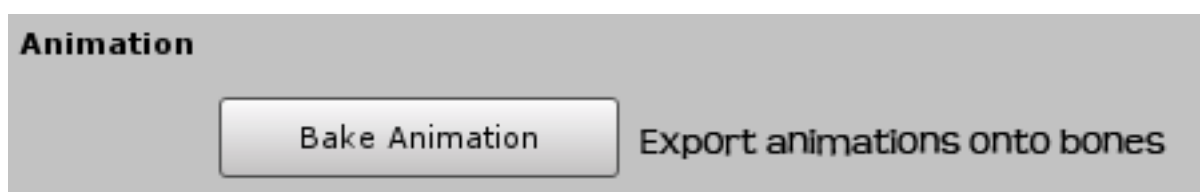
To bind the mesh to the bones, select all the bones and the skin, and click “Bind Smooth Skin”. You can choose the number of bones you want the default skin to bind to using the “num Skin Bones” dropdown menu. Your mesh should now have a Skinned Mesh Renderer component on it. ~If you move the bones the mesh should move with it.

To start editing the skin weights, select the mesh you want to edit and click the “Edit Skin Weights” button. You will see a bunch of vertex objects parented to the mesh. If you select the vertex you will see a list of the bones that influence the vertex followed by their weights. To edit the weight values or influence, just change the values in the inspector. If you want to change multiple vertices at once, change the value and click the “Update Skin Weights” button in the inspector.

To finish Editing weights click the Finish Edit Skin Weights” button, and the vertices will be removed.

You can resize the vertexHandles in your scene by moving the slider to the desired scale.

Animation



To start animating simply create an animation clip on the global_Ctrl and you can move/scale rotate the controls and set keyframes in the animation window.

If you would like to optimize the animations by removing all the control scripts -you can bake the animation onto the bones.

To bake animations ope a scene with the global_ctrls that have the animations you want to bake. Click bake animation – this will make duplicates of all your animations with baked inside the Puppet2d>Animation>Baked folder. These will be the animations as keyframes on the bones instead of the controls. You will also notice after you do this Puppet2d will disable the globalCtrl script. You can now add theses animations to your animation Controller and they can replace all your control animations.