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Using Blender 2.7 for Animation - **Part 6 - Using a Premade Human Rig: Add Premade Rig & Humanoid**

GOAL: Animate at least 3 bones of the rigged creature.

A rig is an armature and any limits and targets it has. A limit is used when a joint can only move so far. A target is used when an object needs to point to something. The Rigify Addon for Blender can provide a human armature with all of the limits of realistic joints.

**To use Rigify’s Human armature, enable the Addon**:

* To avoid having to enable the plugin each time, start a new scene so you can change the “new” scene.
* File, New
* If the “new” scene is not an empty scene with a cube, you may need to click File, Load Factory Defaults
* File, User Preferences
* Addons Tab, scroll down to Rigging category, click checkbox by Rigify
* Scroll down to Import-Export and make sure 3ds and OBJ are checked
* Save User Settings (for earlier versions of Blender, Save as Default)

**Now import any humanoid that is not yet rigged:**

* File, Import, Wavefront (.obj) - (or 3D Studio if only available in that format)
* Resources (or R:) Meshes\Characters\Complete
* Choose any one you want, then click “Import Wavefront OBJ”

(IF the folder is empty, click cancel then click File, Import, Import 3DStudio 3DS or whatever matches the type of file you want)

(IF the model is a blend file such as Public\Meshes\Weapons\Weapon Pack 1 (nick331999 at turbosquid).blend you’ll have to instead do File, Append, Object, then choose the objects)

* File, Save As, **3da6humanoid**

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| TIP: If any part of the body is separate such as head, you can use a Boolean modifier to combine them if they are solids (union may not work well but you may want to try it if the parts of the body are not solids):* (*This is not completely necessary since you can always attach body parts separately later. If you are not sure the object should always be attached to the body, such as a hat, weapon or tool, skip these steps*)
* Right-click to select the *body*
* Click Modifiers (wrench) button
* Click Add Modifier, Boolean, then under Operation choose Union, then under Object choose *head* or other object, then Apply, then delete the old copy of the object you chose from the list.
* If Boolean is not working, undo Ctrl Z, then click X by the modifier. You can always attach body parts to the bones later.

TIP: if you already have objects that have used Union (parts that are not part of the same surface but are part of the same object), you’ll have to separate each part. Select the body, go to edit mode, *right-click* any part of the body, then Ctrl L then p then click Selection (shortcut for click *Select, Linked, Selection*; then *Mesh, Vertices, Separate*)**.** Repeat those two steps for each part that is possible to separate (*You can separate groups of parts such as rows of teeth by selecting them yourself--by go to wireframe shading, press ‘b’ key, then draw a box*). |

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Using Blender 2.7 for Animation - **Part 6 - Using a Premade Human Rig: Add Armature, Align & Attach It**

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**Now add the armature & line it up with the object**

* If you have not enabled Rigify or are using a different computer, click File, User Preferences, Addons, in search box type rig, make sure **Rigify** is checked, Save User Settings, close box.
* Make sure the character is **facing forward (opposite way as the green Y axis arrow)** standing up
* Below the 3D View, click add, armature, Pitchipoy Human (Meta-Rig)
* Hold Alt and press G once, to move the armature (meta-rig, looks like bones) to center of scene
* Move character mesh to bones & scale it to fit height of armature & at bottom click Object, Apply, Scale
* Select the Armature
* Click Armature Object Data  button
* Check the X-Ray option
* Now line up all bones:
	+ right-click Armature so it is highlighted in orange, go to *Edit Mode*
	+ right-click on each joint (sphere) to line up the armature’s joints with the character’s
	+ If you need to move more than one joint at once:
		- Press ‘b’ for box
		- Draw a box around part of the armature such as the hand
		- Now you can move it (‘g’ to grab it, then move mouse to move, then click when done)

TIP: Deselect everything with the ‘a’ key (toggles between Select All & Deselect All)

* + - Hold Ctrl then draw around the part you want

**Now generate and attach the rig** [*if some parts of the body are separate, you can do these steps for each of them separately, but if they are rigid parts such as the head or helmet, use the instructions called “attach rigid accessory” instead*]:

* + Go to object mode (if you had scaled the armature, first select the armature then click Object, Apply, Scale—select the Mesh then *repeat that* or press Ctrl A then click Scale)

*Method 1 (inverse kinematics) skip this if fails (undo then skip to next method):*

* + Generate a rig from the metarig: In Object mode, selected the bones then in the object data button tab click “Generate” button (button will only be there if you enabled Rigify in step 1). The armature (bones) will now be called metarig. Select metarig (bones) in object mode then hide it by pressing the ‘h’ key.
	+ In object mode select the mesh, then shift right-click the rig so the rig (empty spheres, arrows etc) is light orange & the mesh is dark orange (see picture).

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| *Method 2 (forward kinematics):* Select the **Mesh** (e.g. body) first (TIP: if you plan to add *tool/weapon/accessory*, first make it a separate Mesh) **Then Shift right-click the metarig** (bones) so that before continuing to the next step, the mesh is dark orange and the armature is light orange (see picture).  |

* + press **Ctrl P**: must hold Ctrl while pressing P, then let go (The parent menu appears)
	+ Click “**With Automatic Weights**” (**or With Envelope Weights** which may work better with models joined from more than one piece) under armature section in the Parent menu

(If it fails, select the body, go to edit mode, then ‘a’ a couple times to select all, making sure all vertices are orange, then click Mesh, Vertices, Remove Doubles, then try the steps again for “attach bones”)

If there are separate objects for various parts of the body, such as head, you must use the steps below for “rigid accessory” and attach it to the correct bone (such as the head bone) *[If you need to animate the face or accessory such as a scarf, see “Creature Rigging” to add bones, then follow the steps below for “Attach flexible accessory” instead of rigid]:*

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| Attach rigid accessory: repeat steps, selecting that Mesh instead, but after Ctrl P choose “Bone”Attach flexible accessory (such as a whip or rope): give accessory bones, repeat steps with its mesh & armature, repeat steps again but instead of mesh do Pose Mode select *handle bone* first, Shift select *character’s hand Bone second, Ctrl P “Bone”* |

* From now on, animate the character using pose mode. Animate it moving by moving the circle with 4 arrows and saving “Whole Character” keyframes (not LocRot). To avoid separating the mesh from the bones, find the mesh in the outliner on the top left, then click the arrow by the mesh to turn off selecting for it.

See also: <https://www.youtube.com/watch?v=GbcjlEHc9aQ>

Using Blender 2.7 for Animation - **Part 6b - Whole Character Keyframes**

Load a rigged character that is ready to be animated:

* **Use your character, or a complete rigged character** ( File, Open Resources (or R:) *\Meshes\Characters\Complete Rigged\Blender\Mega Pack Rig 2 (Bubles Studio at turbosquid)\2.5\* ) – CartoonGuy or one of your own that you rigged will be easiest to use.
* Right-click to *select the armature* (bones and bone location targets look like circles for CartoonGuy)
* Go to *Pose Mode* (Ctrl Tab)

Now animate the limbs:

* Using the keyframe type dropdown box (see above) change keyframe type to **Whole character** (if you don’t see it in the list, start typing it)
* Go to frame 0 and pose the character how animation will start
* Press the Insert Keyframes  button to **save the starting pose**
* Turn on the record button 
* Go to a later time on the timeline and pose the character again so the **limb moves to another place** (such as left foot forward, right foot back to walk) and Insert Keyframe.
* Go to the time when you want the animation to end and pose the feet so they are **in another position** (such as right foot forward, or whatever way you had them on frame zero, if you animate the creature walking)
* Turn off record button so you can move & rotate objects without animating them
* Set the End frame of the animation to the frame number when the animation ends, so when you press play it plays the whole animation then loops right away.
* Go back to each keyframe and for each hand make **animate another bone** and insert keyframe on each
* Makesure **3 bones are animated (3pts)** and that **at least one bone moves more than once** (3 keyframes)

**BONUS**: Make character walk around something (either around an object in a circle, or avoid an obstacle)