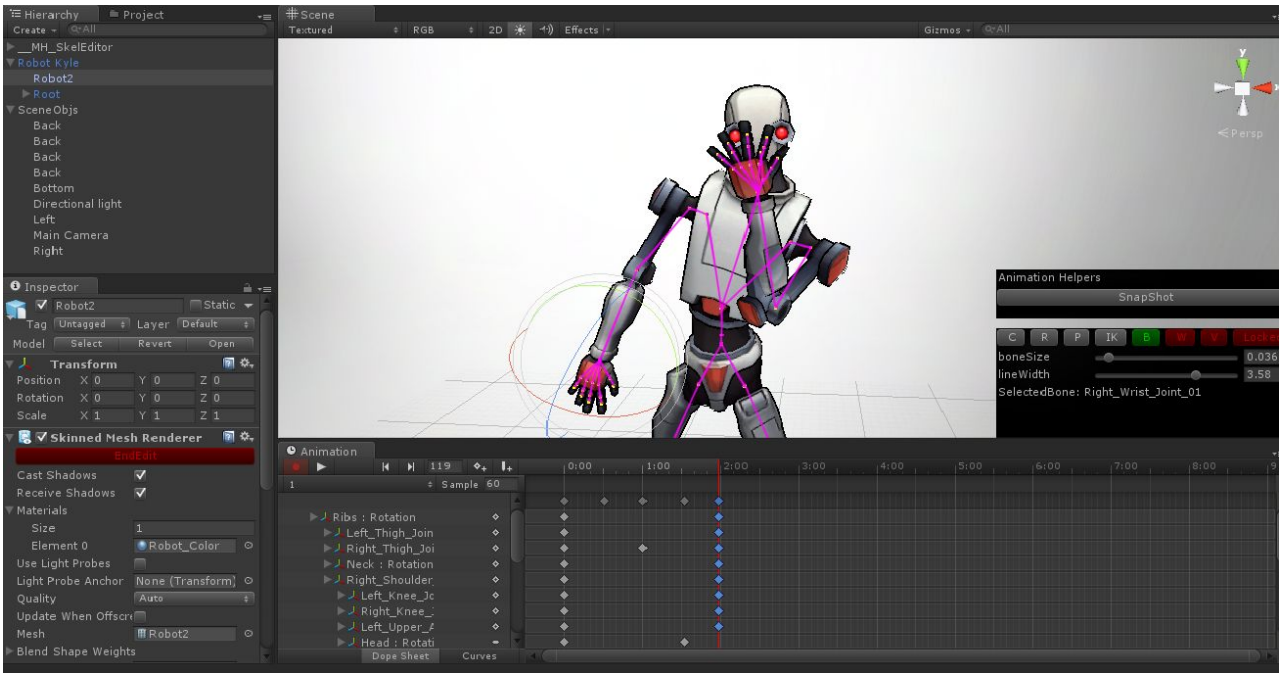
# Skele : The Bone Manipulator

# User Manual

## Contents:



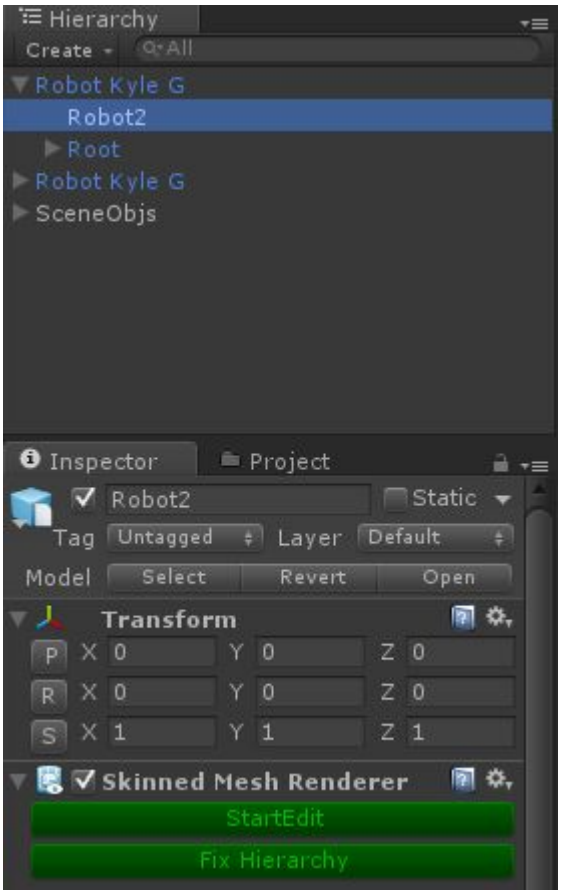


# ● Basic Controls

## 1. Open and Close the Skele editor

### 1.1 Open Skele editor

1) In `Hierarchy' window, Select any GameObject that has a "Skinned Mesh Renderer" (abbr. SMR) component attached ;
2) In `Inspector' window, click the green button with`StartEdit' text




**Tips:** One of the quickest way to select a SMR GameObject in the SceneView, is to click a model TWICE.

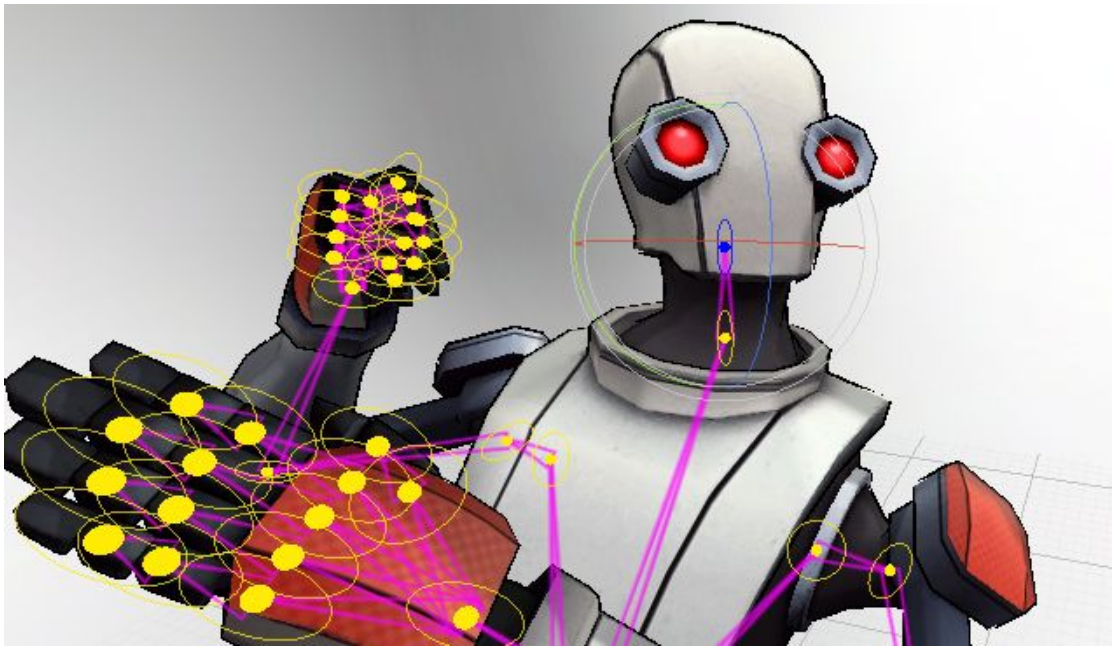
### 1.2 Close the Skele editor

1) In `Inspector' window, click the red button with `EndEdit' text;


**Tips:** Skele creates and destroys helper GameObject on its own. But if exception happens ( unity editor crashes or other bugs ), the helper GameObject could be left in the scene, you could click the 'Fix Hierarchy' button to delete the left GameObject.

## 2. Basic Controls

You could manipulate the bone just as you manipulate the GameObject in a scene.
That means, you could MOVE, ROTATE, SCALE any bones like you do it to a GameObject;



As you can see in the image above:

a) The purple lines are links between joints, in another word, the bones;

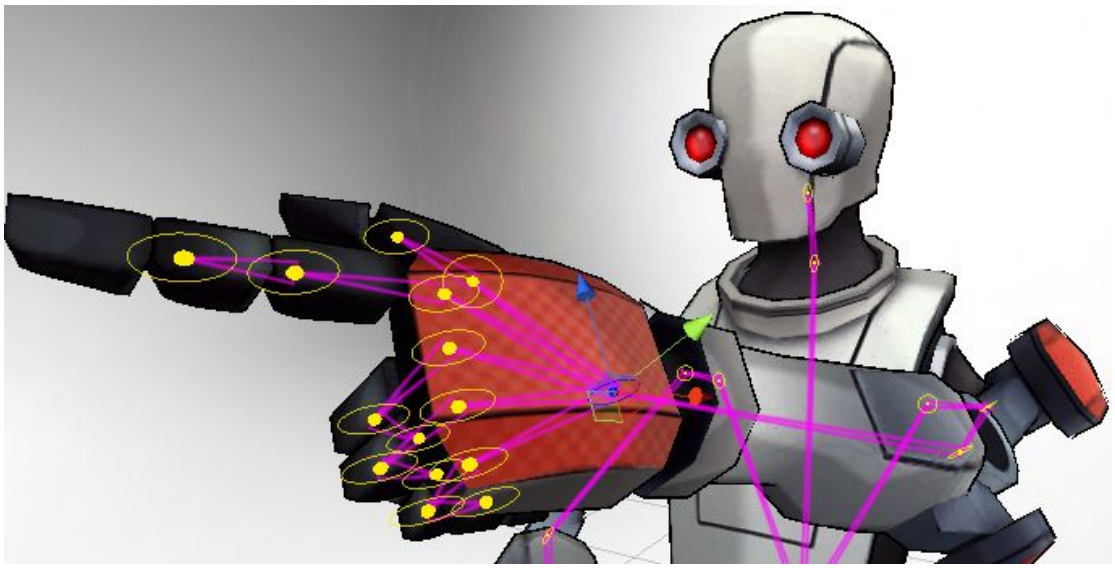
b) The yellow discs are markers for joints, they can be selected by clicking NEAR it (you don't have to pick the pixel accurately, just click around it, 50 pixels or so)

### 2.1 Select / De-select a bone

To select a bone, you click the joint of it. [the YELLOW discs / sphere on the model]
The selected bone will be tinted to **BLUE**, and its name will be shown in the UI window.
To de-select a bone, you could select another bone, or click ESCAPE key on the keyboard.
**TIPS**: ESCAPE key is used in many places as a shortcut for fallback

### 2.2 Move/Rotate/Scale a bone (in a FK way)

After selecting a bone, you could click `W', `E', `R' to enter MOVE, ROTATE, SCALE mode. You will see the corresponding handles like when you manipulate GameObjects, the model will deform as you operate;



**TIPS**: you might notice the orientation of the handles is not like the common global handle, it's because the PivotRotation mode is default to LOCAL now, you could toggle the PivotRotation mode between LOCAL & GLOBAL on the Skele UI;
**TIPS**: you could exit the MOVE/ROTATE/SCALE mode by clicking ESCAPE key.

### 2.3 Manipulate the bones (in a IK way)

You can enter the IK mode either by

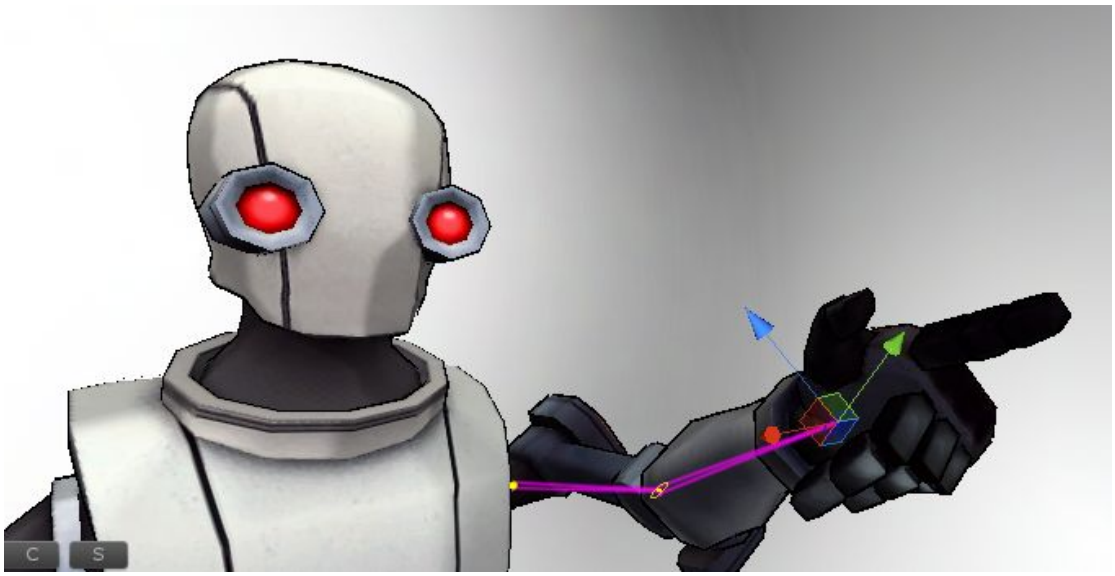
a) Click the `IK' button in Skele UI;
b) Click the `backquote' key to toggle FK/IK mode [`]

If you haven't selected a bone already, you will need to select one as the **`end effector'** first,


After you selecting the end effector, an IK link will be established automatically, default length 2.

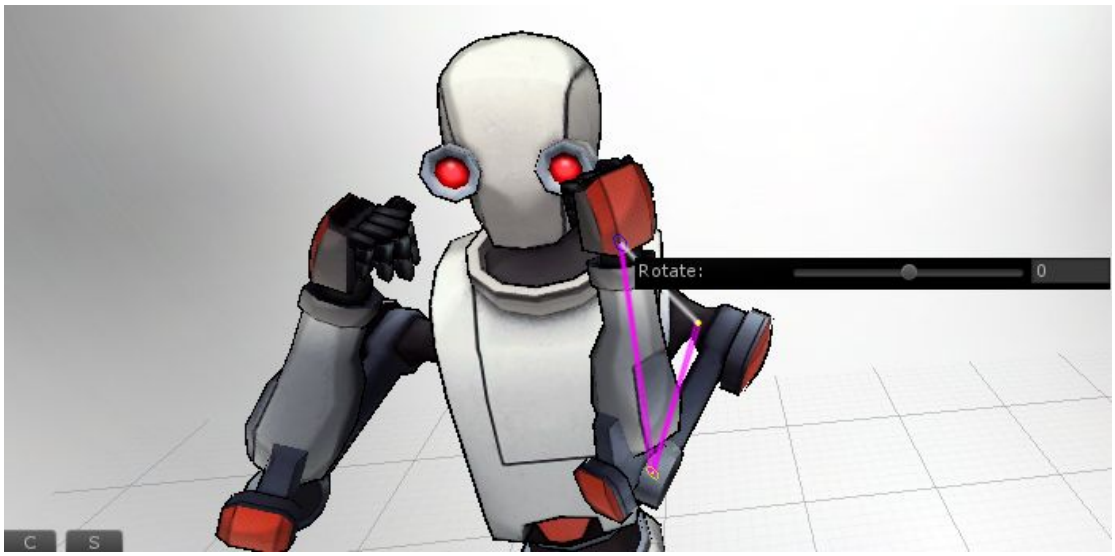

You could increase/decrease the IK link length by clicking the +/- buttons, if there're still qualified bones.

(1) IK MOVE mode



Now, you could press `W' to enter IK Move mode.
In this mode, you could use the handles to move the IK end-effector .

(2) IK ROTATE mode



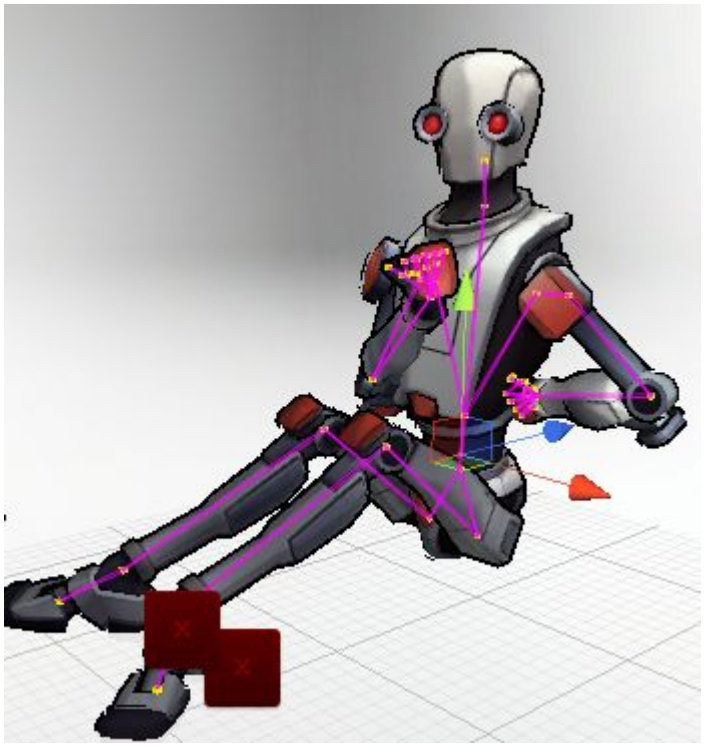

When you press `E' in IK mode, you will enter the IK Rotate mode.
You could drag the slider to rotate the IK link, around the axis formed by root joint and end effector;

If you press ‘E’ again, you would switch into IK-Root Rotate mode, you could rotate the root joint of this IK link immediately without leaving IK mode.

(3) IK Plane Lock

You could turn on IK plane lock to ensure the end-effector only move along your specified plane. (Shortcut: X)

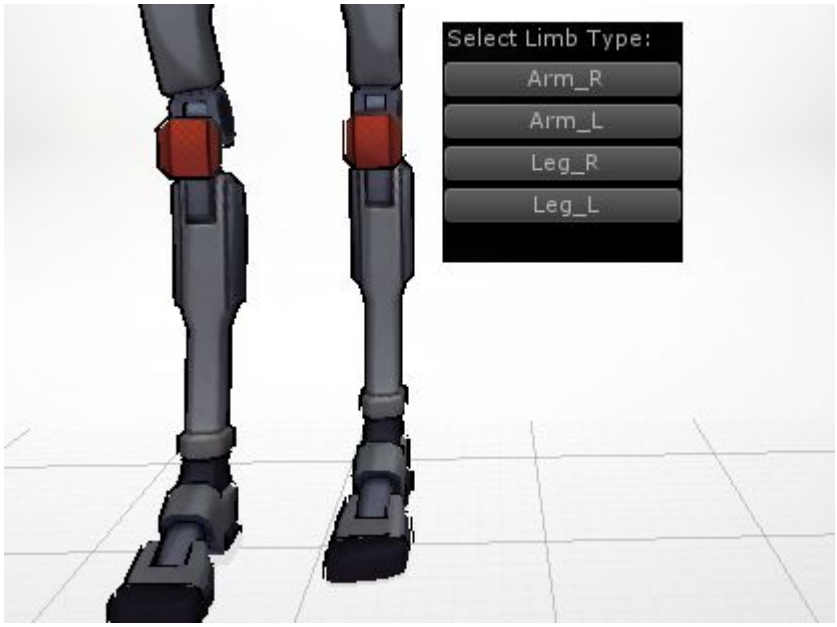
(4) IK Pin Mode



You could pin down the location & rotation of specified joint and move the root of your character. You'd better to add Limb Constraint before using this for better result.
Check out the video tutorial here

(5) Add IK Limb Constraint
IK Limb Constraint will enable specialized IK solver for limbs, will improve the IK quality on arms & legs.

A video tutorial is provide here



**TIPS**: Never PANIC. you can always undo the IK operations by Ctrl-Z.
**TIPS**: You could always get customed to IK operations with the one-bone link first.

## 2.4 Pose Manager

You could use Pose Manager to save/load poses on disk.
Use the `G' Button on Skele UI to open/close the Pose manager;

1) Save / Load Pose files


Click the `Load' button on the Pose Manager UI will bring up the "open file dialog", you could select an existing pose file to load.
Click the `Save' button on the Pose Manager UI will bring up the "save file dialog", you could save current poses to specified file on disk;

There is a example pose file in `Assets/Skele/Poses/' directory, you could test the poses within.

2) Modify Pose


For each pose, there're 4 buttons.
The first one is the pose's name, click the button will **Apply** the pose to current model.
The second one is delete button, but you need to save later to make the change into disk.
The third one is overwrite button, will use current model's selected bones' pose to overwrite.
The fourth one is rename button, you could change the pose's name with it.

3) Create Pose


When Pose Manager UI is on, you could click on one joint to select the joint and all descendant joints, they will be tinted **GREEN**, then you could click the "NEW_POSE" button, an input dialog will pop up to prompt the pose name, with the name decided, the new pose will be added to Pose Manager.

TIPS: You could use Shift+LMB to add/del joints from current joint selection;

## 2.5 Play with the UI

You could adjust many parameters and switches by operating the Skele UI.

### 1) FK mode UI


*`C' button:*
Reset the camera transform to the default setting;

*`R' button:*
Reset all the bones to the prefab pose;

*'G' button:*
Toggle the Pose manager.

*`P' button:*
Toggle the PivotRotation mode between LOCAL & GLOBAL;

*`B' button:*
By default, those bones which don't affect any vertex will be hidden by Unity.
This button will toggle the hidden function.

*`W' button:*
Toggle the wireframe on your model.
It's better to switch on wireframe when you want to watch the vertex weight and the mesh shape; But you'd better to switch off the wireframe when manipulate the bones to get clearer view.

*`V' button:*
Toggle the vertex marker modes between HIDE, NORMAL, TRANSPARENT.
In Normal mode, The vertex marker could be blocked by model;
In Transparent mode, The vertex marker will look lighter when behind model [This feature requires UnityPro to work properly]

*`H' button:*
Toggle the shortcut list

*`LOCKED' button:*
Normally, when Skele editor is on, any operation to change current selection is blocked to prevent exception operations.
You could disable/enable the blocking mechanism by clicking this button. I don't recommend it though, seriously.

*`IK' button:*
Enter the IK mode

*`boneSize' slider*
Control the joint marker's size

*`lineWidth' slider*
Control the width of the lines connecting joints;

**2) IK Mode UI**


The buttons in first line are the same as they are in FK mode;

*`FK' Button:*
Return to the FK mode;

*`Pin' Button:*
Enter IK Pin mode;

`Flip' Button:
Flip rotation direction of all the joints in current IK link;

*`IK Plane' Button*:
Toggle the IK plane lock.
IK plane lock could restrain the IK end-effect to move along the specified plane.

*LinkLength controller:*
The LinkLength means the bones in the IK link. If there're X joints, then the LinkLength will be X-1;

*Reselect End Joint:*
Click this button to clear current selected joint.
You could use ESCAPE key to achieve same effect;

### 2.6 Misc.

1) Skeleton Sharing Utility
This utility could make two skinned meshes to share one instance of skeleton.
You could see the video tutorial here


The utility is located in Unity menu "Edit/Share_Skeleton";

You need to put the main skinned mesh renderer(SMR) at the first slot, the accessory's SMR at the second slot, then click the Share_Skele button, it will be done.

2) Muscle Clip Converter

Muscle clip (Humanoid animation) is animation clips specially for Humanoid rig characters. With Muscle Clip Converter, we could convert the Muscle clips to Legacy/Generic animation clips for any models that can be converted to Humanoid rig.

You could see the video tutorial at here


The utility is located in Unity menu "Window/Skele_MuscleClipConverter";

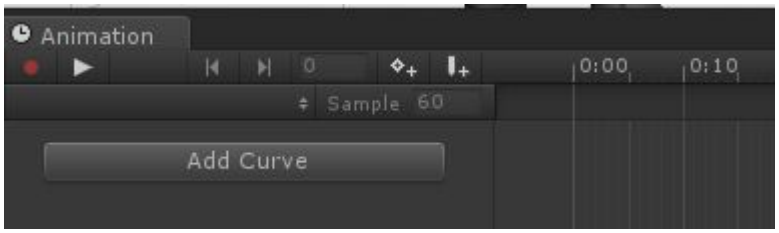
Animation Helpers

# Make Animations

To create a animation for your characters, we utilize the Unity Animation Window(abbr. UAW) like working with other GameObjects;

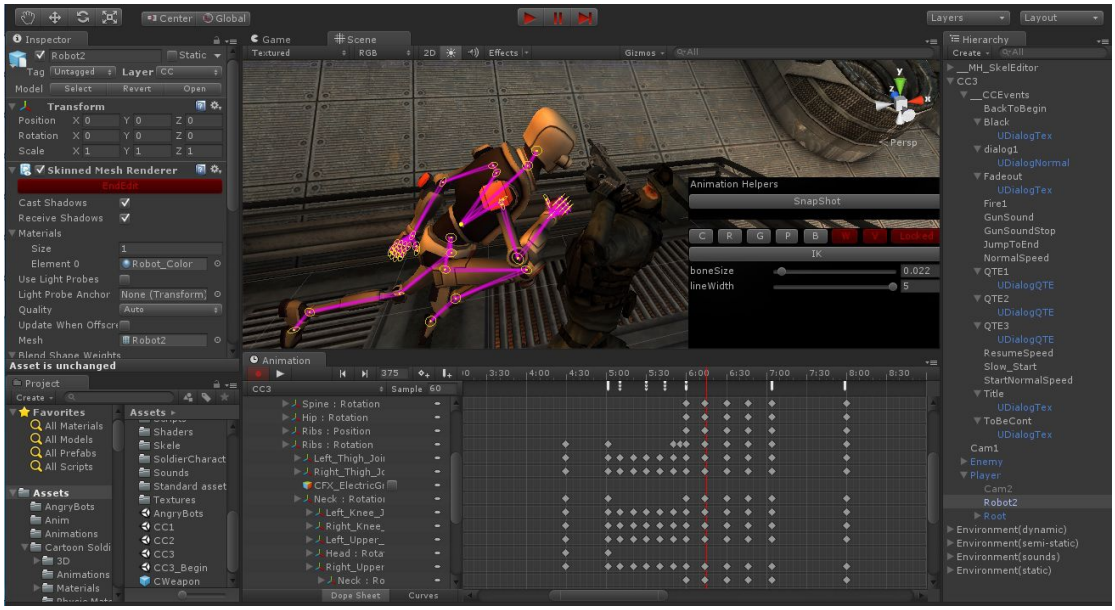
For more info on Making CutScene, please refer to the 'CutScene Director Manual' in the package.

Call up the Animation Window, and click the record button or click on the timeline to start a new animation;




Manipulate the bones, the keyframes will be recorded automatically.

The screenshot of recording process for Cutscene demo 3:



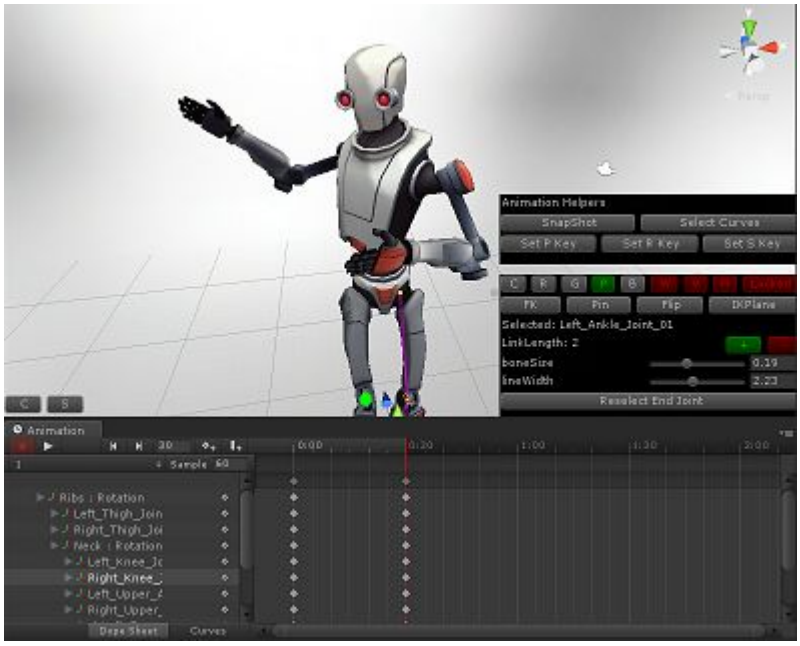

It's a good practice to start the animation editing work with the Prefab pose. ( You could click the `R' button on UI to reset to Prefab pose)

## 1. Animation Helpers

Skele provides a groups of helpers to aid your animation authoring work.

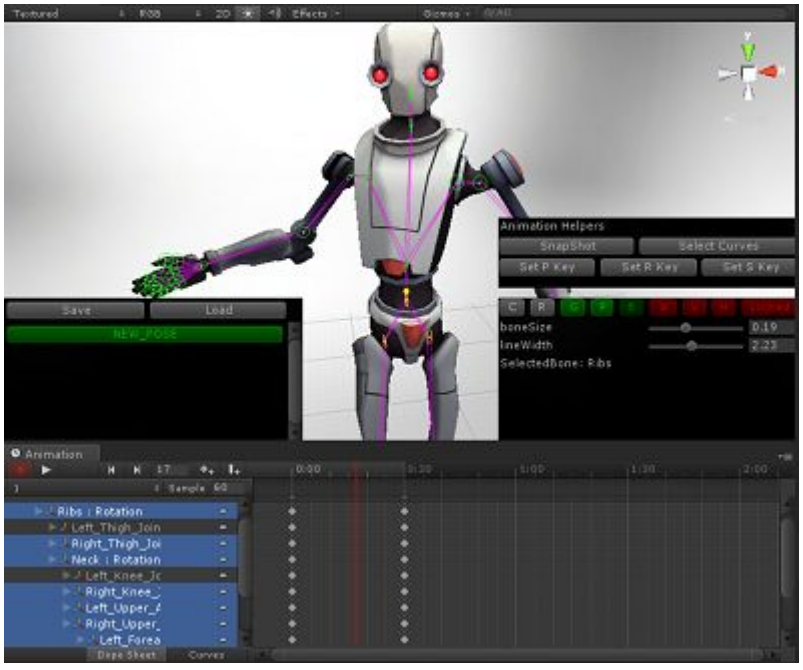
### 1.1 SnapShot

SnapShot will make keyframes on current time, based on the difference between current pose and prefab pose.



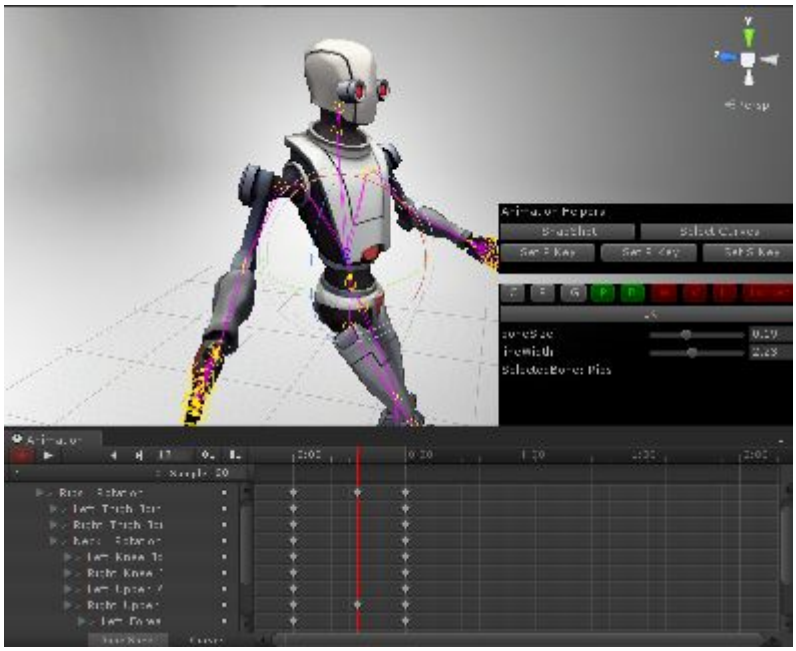

### 1.2 Select Curves

‘Select Curves’ button will select corresponding entries of current selected bones, in the Dope Sheet of the UAW.  This is very useful when there’re a lot entries in the Dope sheet.




### 1.3 Set P/R/S Key

‘Set P Key’ / ‘Set R key’ / ‘Set S Key’ buttons enable you to force set position / rotation / scale keys for current selected bones on current time position.



# • Work Faster

Like in any other tools, mastering shortcut keys could improve your efficiency significantly.

### 3.1 FK Mode:

- ESCAPE: to cancel current operation mode;
- W/E/R: switch to MOVE/ROTATE/SCALE mode;
- P : toggle LOCAL/GLOBAL PivotRotation mode;
- `(backquote) change to IK mode;

### 3.2 IK Mode

- ESCAPE: deselect current bone, when no bone is selected, will fallback to FK mode;
- 1/2/3: change IK LinkLength, only take effect when a bone is selected;
- W: enter IK Move mode;
- E: enter IK Rotate / IK Root Rotate mode;
- X: toggle IK plane lock;
- P: toggle LOCAL/GLOBAL PivotRotation mode;
- `(backquote) change to FK mode directly;

# Other Links

- Forum and videos
- AssetStore
- CutScene Demo 1 / 2 / 3 / 4 / 5