

Advanced Rigging tools in Maya

A tutorial for using the Zoo Character Setup Toolkit

Synopsis:

The zooCST is a plugin for the Maya 3d program which enables automated rigging of characters. In this tutorial, I'll describe the steps needed to rig a basic biped character.

ZooCST by Hamish McKenzie: <http://www.macaronikazoo.com/>

Tutorial by Jerry Kalkhof: <http://www.jerryartist.com>

Requirements:

Maya7.0 or above

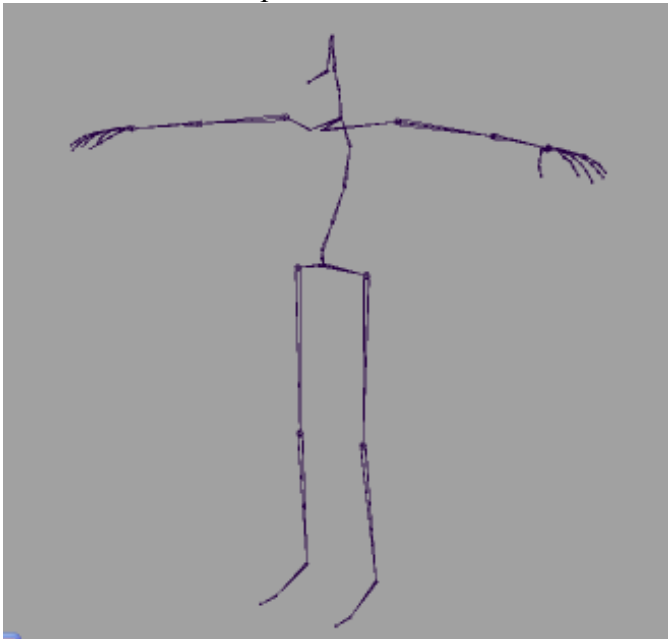
ZooCST plugin

A simple biped mesh

A simple skeleton joint system.

1. Installation
 - first install the zooCST plugin
 - run the zooCST script from Maya script editor
 - note: the interface gui seems to be sensitive – wiggling it around will crash Maya 7.
2. create a basic skeleton inside your biped mesh

basic skeleton example:



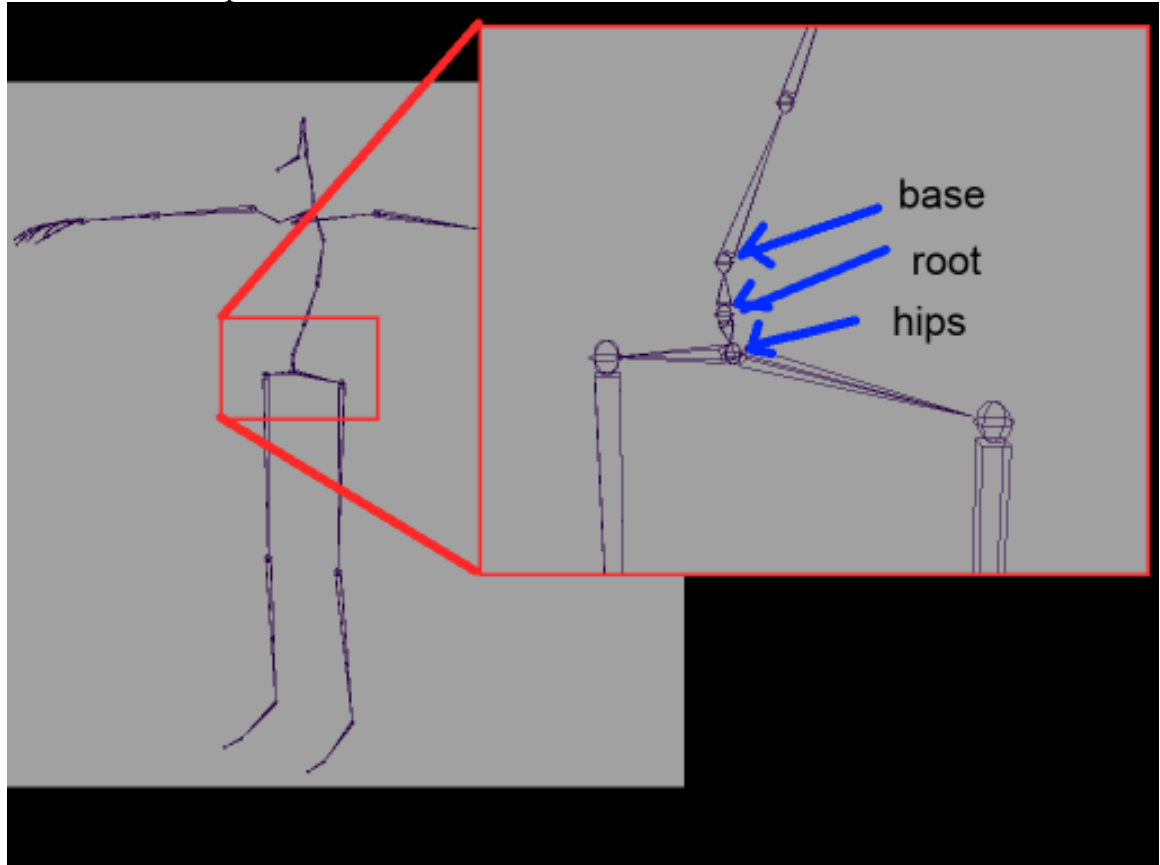
It is important to have hips, root, and base separate near the center of gravity!

Hips-> root <- base <- spine1 <- spine2. ...

Otherwise, legs won't act properly for inverse kinematics!

Another reason for the Root separate from hips is so hips can rotate, and spine can rotate separately from the root. You may choose to move all of these joints to the same location, but I spaced them out in the following example for clarity:

Joint detail example:



Naming convention note:

CST is sensitive to joint names, so naming according to its naming convention will allow you to guess joint names and automatically rig a character much faster than by picking joints.

Rig primitives (names that CST likes)

root, fkSpine, ikSpine, head, basicEye, moveableEye, arm, leg and finger.

Use suffix _L or _R for right and left side of the skeleton

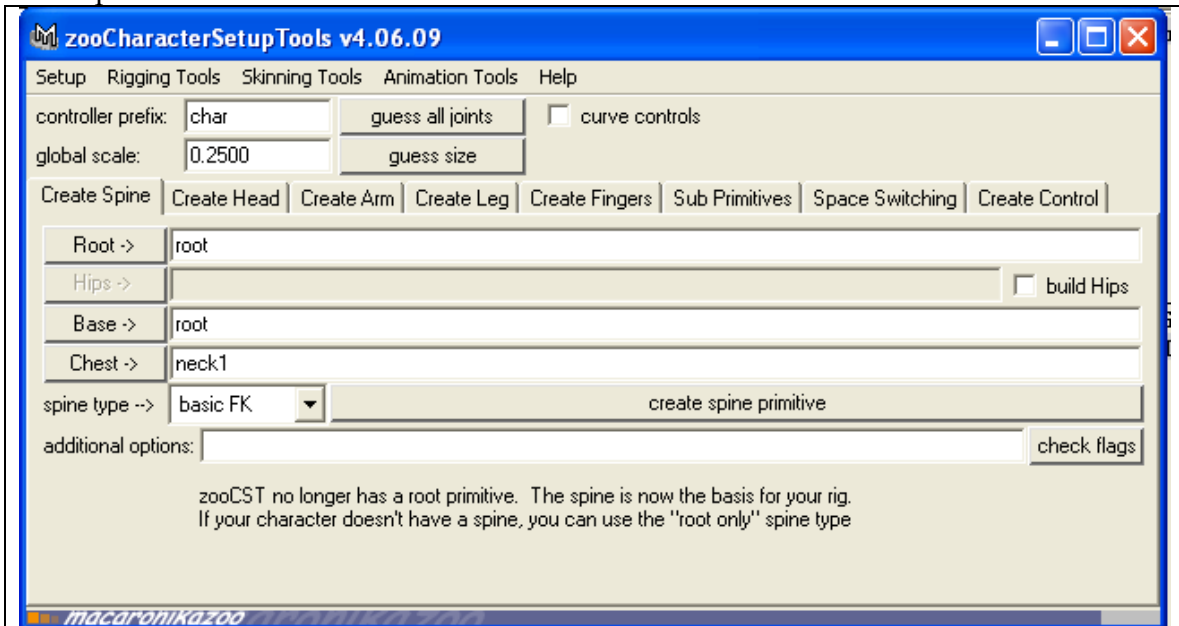
Joint orientation note:

CST is sensitive to the orientation of the joints for the thumb, and feet.

If the thumb isn't perpendicular to the other fingers of the hand, the automatic rigging of the thumb might orient the joint incorrectly.

The feet should face forward, not at an angle (like the poser characters)

Startup the zooCST interface

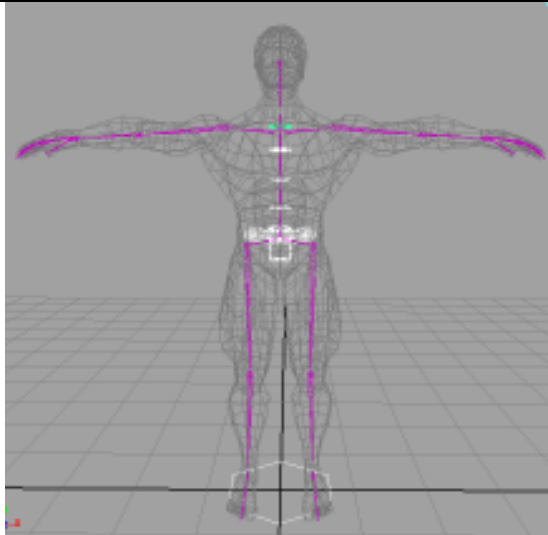


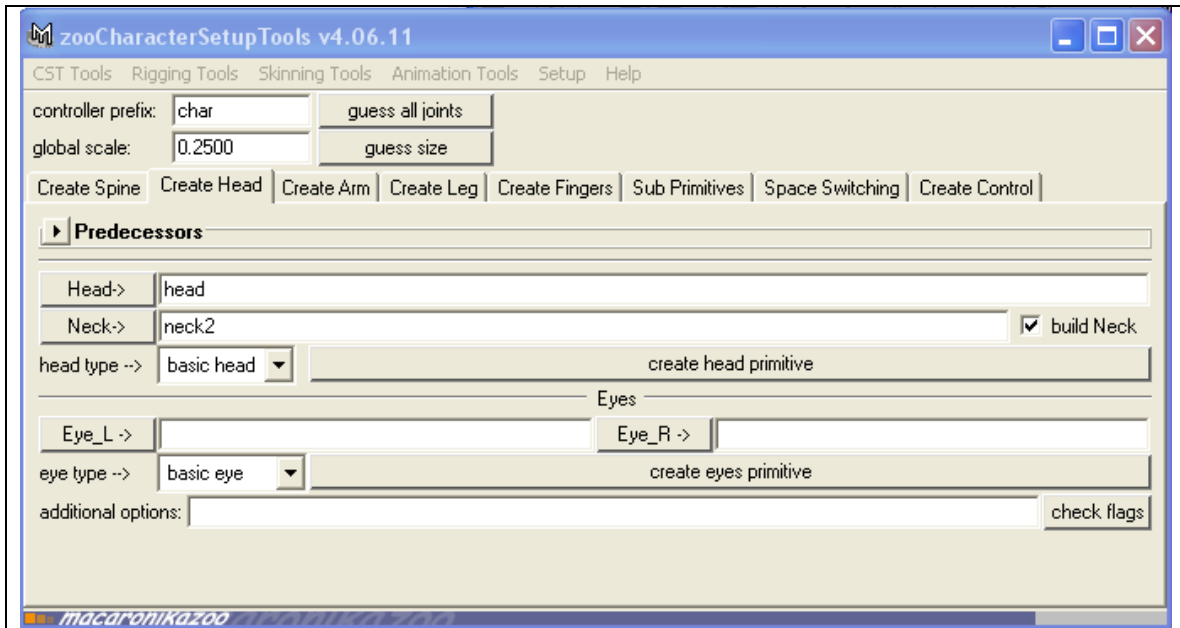
1. select create spine tab

- a. use “char” as prefix name
- b. select character’s root joint and select CST “root ->”
- c. select root joint and CST “base->”
- d. select joint where spine and arms connect and select CST “chest ->” ??
- e. select hips joint and CST “hips ->”
- f. click CST “create spine primitive”

this builds “char_world” hierarchy and

char_hips_ctrl, char_root_ctrl, char_spine_0_ctrl controls

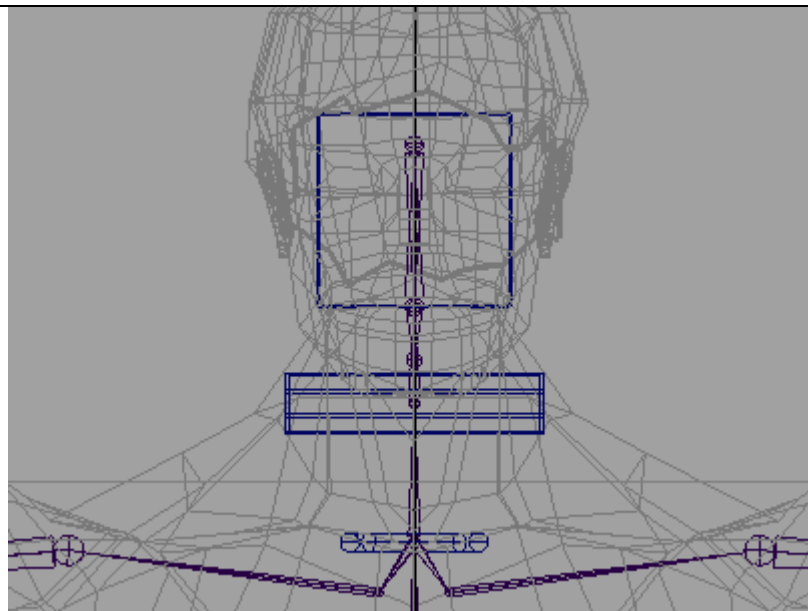


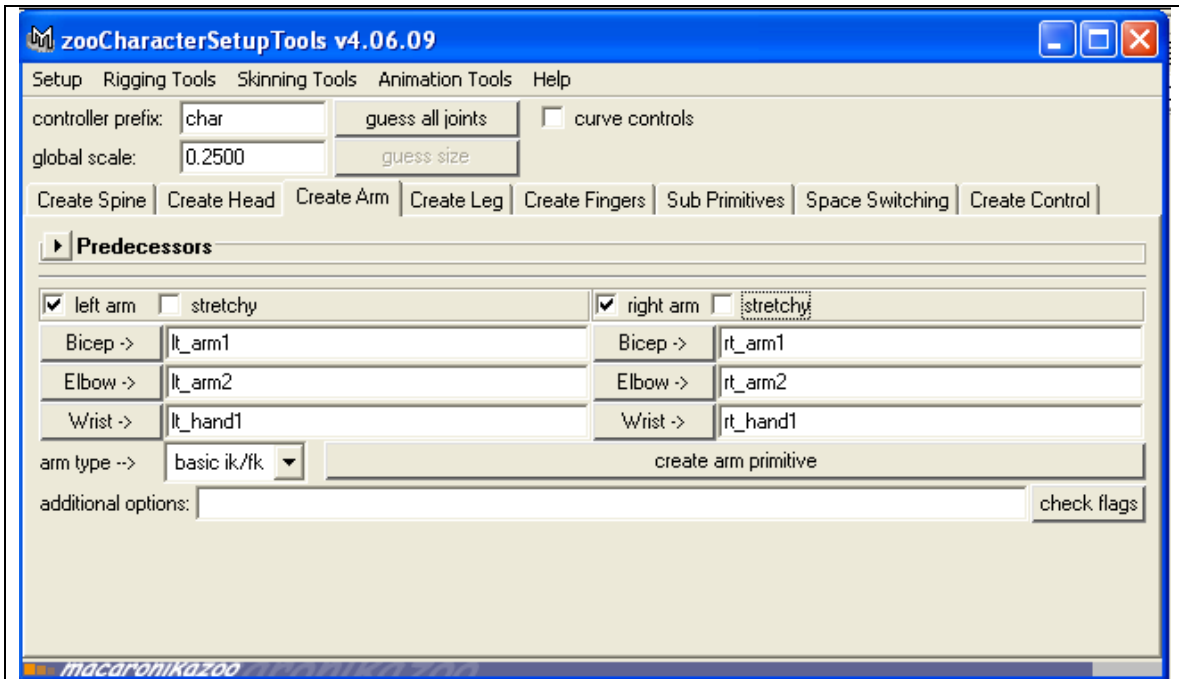


2. select “create head tab”

- a. select head joint and select CST “head ->”
- b. select neck joint and select CST “Neck->”
- c. click CST “create head primitive”

this builds “char_head_ctrl” and neck_ctrl

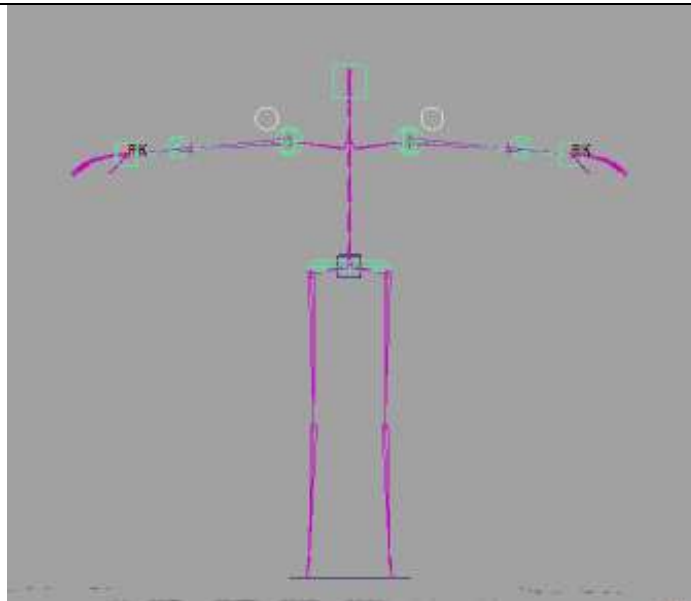


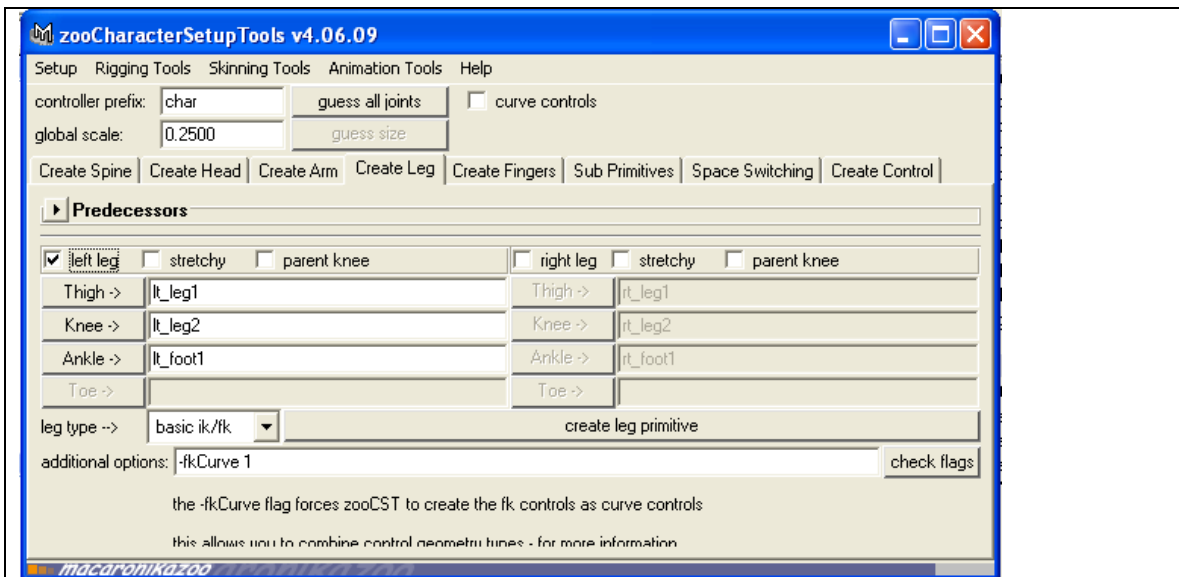


3. select “create arm tab”
 - a. turn off stretch for left arm and right arm
 - b. select joint near bicep and CST “Bicep ->”
 - c. select joint near elbow and CST “Elbow ->”
 - d. skip past ulna twist joint, and select hand joint as CST “Wrist->”
 - e. select “create arm primitive”

This will build the basic arm ik/fk controls

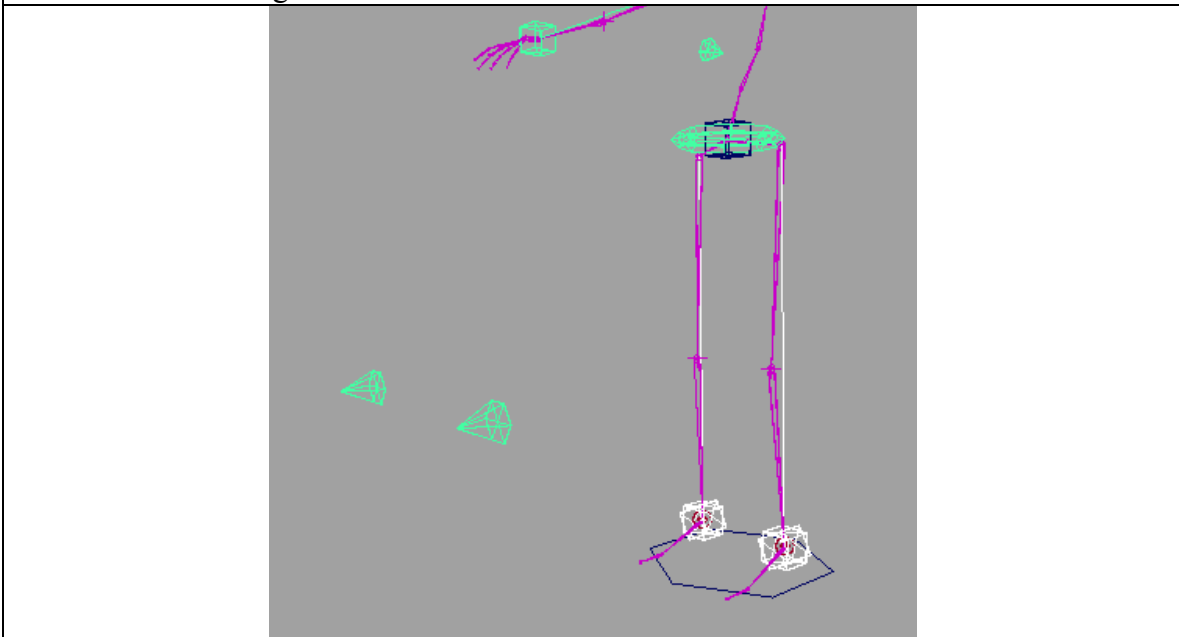
char_arm_ctrl_L has ikBlend – set this attribute to zero to enable forward kinematics

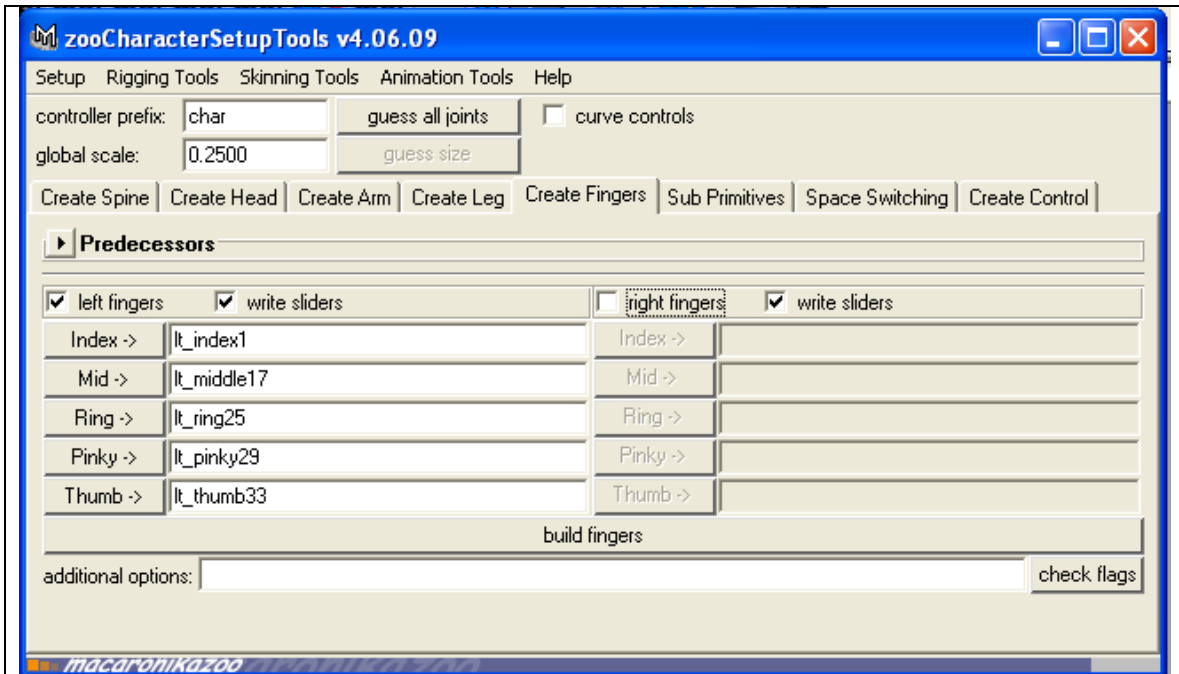




4. select “create leg” tab
 - a. turn off stretchy
 - b. note : I experienced a bug here, so I build one leg at a time
 - c. select “lt_leg1” and CST “thigh ->”
 - d. select “lt_leg2” and CST “knee ->”
 - e. select “lt_foot1” and CST “ankle ->”
 - f. turn off right leg, parent knee
 - g. select CST “create leg primitive”
 - h. repeat above steps for the right leg

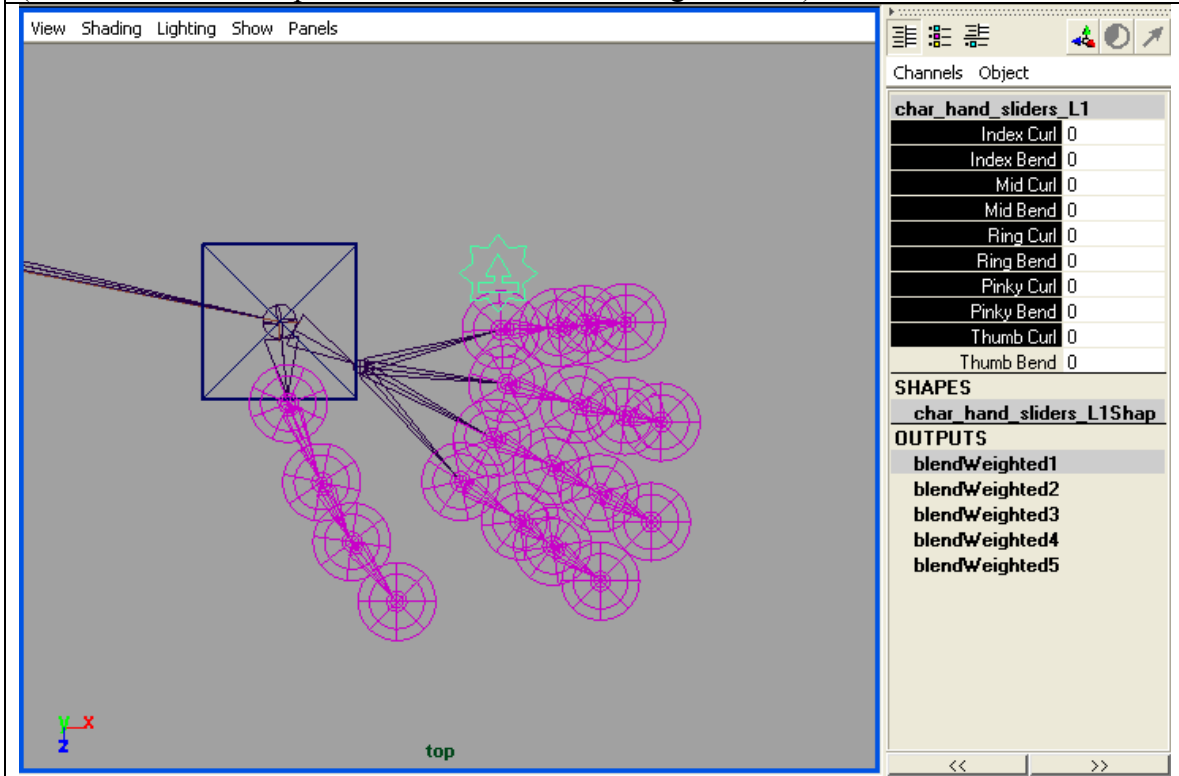
this will build the leg as seen below





5. select “create fingers” CST tab
 - a. select finger joints for each
 - b. select CST “build fingers” to build one hand at a time

this will create the rig controls as shown below
(use arrow inside of spoked wheel to access the finger sliders)



Okay, that's it – we have completed basic rigging on a biped character using the zooCST automated rigging tool!

FAQ:

Q: Hey! The knees don't bend when I move the body controller down
-it just stretches the bones!!

A: This probably means that you didn't rig the root, base, hips correctly, and the tool couldn't figure out which center is relative to the legs. I usually just rebuild the ik on the legs to fix this otherwise.

Q: Hey – the thumb bends the wrong way!

A: CST is sensitive to the finger orientation when you set up this controller.
It assumes 90 degrees to other fingers.

Q: Hey, after I rigged the hand, the fingers bend the wrong way!

A: This is probably due to orientation on the joints/bones of the hand.
Re orient the joints
Rebind the skeleton
Rebuild the fingers usin CST

Q: My controllers are huge compared to my character.

A: Adjust the global scale value when you are setting up your joints.

To see the zooCST rig in action, you can check my rigging demo reel at youtube here:
<http://www.youtube.com/watch?v=WoPFRbQK4eQ>