Version: 1.5

Plugin and User's guide last update: 11-2017

Compatibility: After Effects CS6 and later

'Bones' is a plugin for After Effects built to handle rigging and kinematics.

What's different from other rigging tools?

'Bones' performs distortion directly on layers, offering smoothly bent junctions.

It doesn't require straight arms or legs. It can be set on already bent arms and legs, avoiding heavy preparation work on Photoshop.

All the geometry computation is done directly inside the plugin, so you won't need extra Null layers and / or heavy expressions.

'Bones' is also the only rigging tool entirely keyframable, including parenting, overlapping, kinematics mode (inverse, direct, manual) ...

'Bones' comes with its own interface, **'Puppeteer'**, that lets you control several **'Bones'** at a time, and

'Bones overlaps manager' that lets you animate overlaps.

It's hardware accelerated, using OpenGL engine, for super fast rendering.

Parameters description:

1_MESH

Radius: controls the width of the mesh (unused when using masks).

Mesh definition: default value is 100. You can use higher values if the mesh is highly distorted.

Mask 1 / Mask 2: select masks to define the borders of the mesh. Prefer 3 vertices masks for better results. Replaces Radius.

2_POINTS

Show: lets you choose between 3 modes, Selection only, Distortion only, Selection & Distortion.
Each mode enables / disables selection and distortion points, so that you can directly drag the points you want in the composition window.

Select 1, Select 2, Select 3: the selection points that define how the mesh will be distorted. Usually, you'll set their positions on Shoulder/Elbow/Wrist or Hip/Knee/Ankle.

Distort 1, Distort 2, Distort 3: the distortion points that will actually distort the mesh.

Copy: easily copy selection points on distortion points, or opposite. Copying selection on distortion will reset distortion.

Point scales:

Scale point 1: the mesh scale at 'Distort 1' point.
Scale point 2: the mesh scale at 'Distort 2' point.
Scale point 3: the mesh scale at 'Distort 3' point.

Auto-scale: if set, 'Scale point 2' will be relative to mesh bending. This is really useful for Squash & Stretch, and for simulating perspective.

3_IK

IK_scale: lets you modify your rig's scale. Animatable. (new in v1.4)

IK_mode: lets you choose between Auto, Manual and None (2 points). Animatable.
Auto mode computes inverse kinematics.
Manual mode lets you animate the 'middle' point (elbow or knee).
None (2 points) mode performs straight distortion. It uses no 'middle' point.

Clamp max size: if set, will constrain distortion to original mesh size (unused with manual mode).

Flip: flips the IK direction.

IK proportion (left/right): the percentage of distortion affecting 'middle' point. Can be negative and over 100%. Usefull to simulate perspective.

IK proportion (up/down): if proportion (left/right) is not 100%, lets you give priority to upper / lower part of the mesh. Also useful for perspective simulation.

Invert order: inverts overlapping order. Used to define if upper or lower part should overlap the other.

Keep original bend: the bending proportion of the mesh. 100% fits the original bending of the layer. Can vaty from 0% to 200%.

Bending minimum: defines the shortest distance between Shoulder/Hip and Wrist/Ankle. If points are closer, the mesh won't be more distorted.

Bending maximum: defines the longest distance between Shoulder/Hip and Wrist/Ankle. If points are further, the mesh won't be more distorted.

Un-bend at start: if set, the mesh won't be distorted around Shoulder/Hip point.

Start angle: if Un-bend at start is set, defines the angle to unbend mesh around Shoulder/Hip point.

4_SOURCE

Source 1: default value is None, meaning the plugin uses the source of the layer at current time affected by effects applied before it. You can select the actual layer, or another layer.

Time mode 1: when a layer is selected, you can use the layer either at current time or time selector (see description below).

Time selector 1: if a layer is selected, and Time mode set to selector, you can use this parameter to define the time of the layer. It will act as a time remap. The time is set by frame.

5_CHILD PARAMETERS

Child source: select a layer as a child.

Child time mode, Child time selector: same as Time mode 1 and Time selector 1, but for child.

Attachment anchor: same as the anchor point of the child layer (disabled by default).

Position: child position, relative to the mesh (disabled by default).

X_scale, Y_scale: the scale of the child layer.

Rotation: the rotation of the child layer (added to mesh rotation if Child inherit rotation is set to Always, see description below).

Child inherit rotation: if set to Always, child will follow mesh rotation, not if set to Never.

Compositing mode: 4 different modes, Behind (smart), In front (smart), Behind (full), In front (full). Smart modes mean that, for example, if a hand is over a forearm, and the forearm is under the arm, the hand will be under the arm too. Full modes mean that in this example, the hand will be over forearm and the arm.

Hide child position controls: if set, Attachment anchor and Position are greyed and don't appear in the layer of composition window. This avoids to drag them by mistake. If you want to move them, unset this parameter.

Starting from v1.3, you can add Childs with independent Bones instances (see 'Add child').

6_PARENT PARAMETERS (this topic will only appear if one or more instances of 'Bones' were set before the actual instance)

Parent effect: used to select a parent for your mesh.

Parent proportion: if a parent effect is selected, use this parameter to define which part of the parent mesh the actual mesh will be attached to (when you select a parent effect, this parameter is automatically set to be as close as possible as the former position).

Parent offset: same as above, but defines the offset.

Inherit parent rotation: if set and Un-bend at start is set too, the actual mesh will be affected by parent's mesh rotation.

7_ADVANCED SETTINGS

Auto key: if set, 'middle' point will be set when you switch from Auto mode to Manual.

Use rounded time: if Source 1 or Child source use time selectors, and this parameter is set, layer times are rounded by frame. If not, layer times are interpolated (like a time remap).

Auto set anchor points: if set, and a Child source is selected, Attachment point and Position will be automatically set according to Child source settings.

Show bone: if set, a Bone (3 circles attached by lines) will be visible when the effect is selected.

Bone color: the color of the Bone. **'Puppeteer'**'s handles color will use this color, and changing the color in **'Puppeteer'** will affect Bone's color.

Bone handle size: size of the Bone's circles.

8_RENDER PARAMETERS

Opacity: opacity of current Bones instance. (new in v1.4)

Alpha blending: two different modes, Saturate and Premultiply. Affects mesh transparency. Note that **'Bones'** uses OpenGL transparency modes, which are different from After Effects' transparency.

Composite mode: can be 'None', 'Over original' and 'Under original.'

Quick bone set: when clicked, selection points are copied to distortion points, and 'Show' parameter is set to 'Distortion only'.
If you select 'Set with controllers', Null layers will be created and distortion points automatically linked to them.
If you select 'Set with controllers (last point only)', 1 Null layer will be created and last distortion point automatically linked to it.

Add child: when clicked, a new instance of **Bones** is added to the effect stack, already parented to the current effect. (new in v1.3)

PUPPETEER

'Puppeteer' is an Interface plugin that lets you control several **'Bones'** at a time.

Parameters description:

CONTROLS

Controls will appear according to the number of **'Bones'** on the layer / in the composition.
They will adopt each **'Bones'** name, plus the name of the layer if **'Puppeteer'** controls several layers at a time. You'll find point parameters that you can drag, and color pickers to change **'Bones'** colors.

Updater: click it if handles don't appear. It can happen if After Effects uses the cache. Changing composition time or resolution will have the same effect.

OPTIONS

Handle size: the size of all the handles. this affects the 'clickable' area around point parameters.

Handle colors: if set to 'Randomize', will set a random color for every handle. also affects each **'Bones'** color.

Reset all bones: if set, resets **'Bones'** points to original value.

Source:

First case: 'Puppeteer' is applied to a solid of composition size, or an adjustment layer.
If Source is set to none, **'Puppeteer'** controls all the **'Bones'** of each layer in the composition.
If Source is set to a layer, **'Puppeteer'** controls only the **'Bones'** of this layer.

Second case: 'Puppeteer' is applied after one or several **'Bones'** instance on a layer.
In this case, set Source to your actual layer in order to control the **'Bones'**.

BONES OVERLAPS MANAGER

'Bones overlaps manager' is a plugin that lets you control and animate overlaps of all your **'Bones'** at a time.

For each **'Bones'** instance, you'll find 2 parameters in **'Overlaps manager'**. The first sets the **'Z'** value at mesh start, the second at sets the **'Z'** value of the mesh at end.
'Z' values work just like 3D layers in After Effects: the bigger the further from the screen.