

TUTORIALS

TECHNIQUES / TIPS / TRADE SECRETS

• This month's lead tutorial takes you from bald model to a fully hirsute anime figure with well-kempt locks blowing in the virtual breeze

electric anime hair

CINEMA 4D



No longer the domain of rock-hard poly-modelled hairstyles, modern 3D anime like *Final Fantasy VII: Advent Children* opt for a softer, semi-stylised look. Discover how to recreate it in Cinema 4D's new Hair module **BY ADAM BENTON**

Maxon's Hair is Cinema 4D's first fully integrated module dedicated to creating ultra-realistic long, flowing hair, animal fur, feathers and even grass. It's powerful, it's versatile, the interface is a breeze to use, and the results look uniformly excellent. But because this issue is focusing on 'all things Japanese', we thought we'd see how easy it would be to use Hair to animate something a little more stylised: anime hair.

In recent years, anime has become increasingly more CG-driven, with groundbreaking films such as *Appleseed*, *Final Fantasy VII: Advent Children* and *Ghost in the Shell 2: Innocence* showing just how well the old and the new can be integrated to create stunning visuals.

Initially, hair in such projects tended to be poly- or spline-modelled rather than made from individual strands, since the classic 'clumped and spiky' look is well suited to this particular genre. However, in more 'realistic' films like *Final Fantasy VII*, that clumped and spiky look appears to have been generated with more accurate hair simulation, for an appearance that, although still stylised, is semi-realistic.

With this in mind, we put the Hair module to work to see if it was possible to generate the same look, and then to create a short animated clip in the style of bleeding-edge anime, with the hair flowing and jittering in a gusty breeze.

Full-sized screenshots, scene files and test animations can be found on the CD, along with stock anime content provided by DAZ Productions (for details, see page 74), while the final animation itself is available for download on the *3D World* website. If you plan to start from the DAZ characters, rather than loading in the scene file on the CD, you'll also need the demo of Robert Templeton's *interPoser Pro* plug-in to enable you to load the *Poser* content into *Cinema 4D*: you can find it at <http://tinyurl.com/y5auyp>

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FACTFILE

FOR

Cinema 4D,
Hair module

DIFFICULTY

Intermediate

TIME TAKEN

1-3 hours

ON THE CD

- Full-size screenshots
- Key scene files
- Animation tests
- DAZ anime content

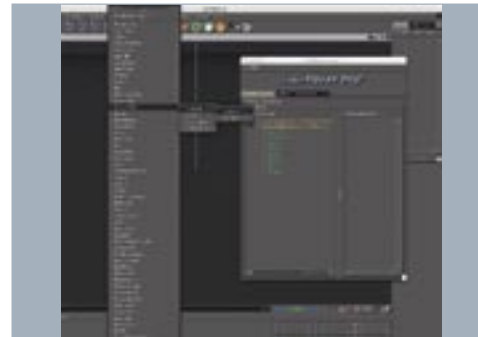
ALSO REQUIRED

interPoser Pro (demo available from <http://tinyurl.com/y5auyp>)

STAGE ONE | Base figures



01 This tutorial doesn't require any specific models to work with, but we've decided to use DAZ Productions' popular anime-style figures, Aiko and Hiro, to apply our hair experiments to. DAZ has kindly donated them for inclusion on this issue's CD (see page 74 for details). You can use a base model of your own if you prefer.

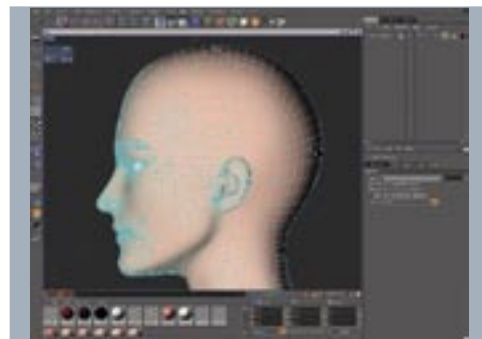


02 If you want to use the DAZ figures, there are a number of ways that you can import them into C4D, but the most efficient method would be to use Robert Templeton's *interPoser* plug-ins. The *Pro* version of this plug-in suite (reviewed last issue) not only allows the figure to be imported, but retains all of its pose-ability. It can also be customised and animated right inside C4D.

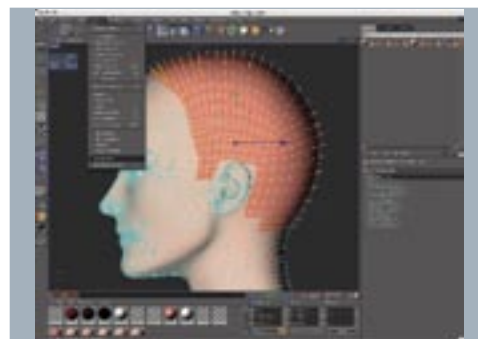


03 Follow the included instructions and install *interPoser* and the DAZ content. From within C4D, click on the Plugins menu, and choose KuroyumeDZ > *interPoser Pro* > *interPoser Pro*. Tell *interPoser Pro* where your *Poser* runtime content libraries are and you can then browse the content in the Runtime Explorer window. Afterwards, click on an item to load it into C4D.

STAGE TWO | Making scalp selections



04 If you don't want to use your own model, you can load *Start_Here.c4d* from the CD, which has the character already set up. First, you need to prepare an area of the scalp so you can apply the hair. The easiest way to do this is to switch to a side view (press [F3]). Select the Live Selection tool, and be sure to uncheck the Only Select Visible Elements option in the Attributes Manager (AM).



05 Make sure that the Polygon Tool mode is selected, and click and drag the Live Selection pointer over all the head's polys that would be suitable for a scalp area. In the perspective view [F1], see if you've missed any polys. Be careful to re-check the Only Select Visible Elements option, or filling any selection holes on the rear of the head could inadvertently select some on the front, too.



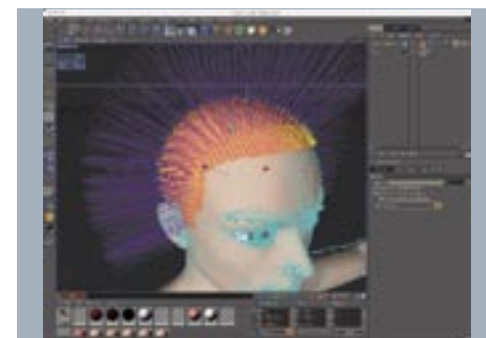
06 Once you're happy with the selection, go to Hair > Add Hair. On our DAZ figure, the length of the default hair is going to be too long, so the first thing to do is shorten it. Click on the newly created Hair object in the Object Manager (OM) window and select the Guides tab. Reduce the Length from 100 to 35.



07 Since we want classic spiky, gravity-defying anime hair for this male character, we don't need a lot of Segments, so reduce the count to between 4 and 6. Next, click on the Hairs tab and similarly reduce the Segments value. The default 5,000 hairs won't be enough, ultimately, but the figure can stay as it is while the hair is being styled to speed up test renders.



08 Now that we have a visual guide to the hair, we realise that the hair selection we made earlier doesn't have the right look or shape to the front of the hairline. But rather than starting over, we can simply expand our scalp selection. Select your base figure and make sure that you're still in the Polygon Tool mode.



09 The hair will have created a Polygon Selection Tag for the area that hair is grown from. This should be the first tag next to the figure in the OM (double-click it to reload that scalp selection). As in Step 5, hold down [Shift] and select some more polys to extend the scalp down the forehead and temples. From the Selection menu, select Set Selection to update the current Selection Tag.

STAGE THREE | Dynamically driven hair



10 So that the hair knows to include the extra scalp area you created in Steps 8 and 9, select the Hair object and, under the Guides Tab, change the Map dropdown to New, and click on Update Guides. Your new scalp selection should now have hair growing from it.



11 Press the play forward button, and let the hair's gravity come into play, making the locks fall dynamically. The difference between 4 and 6 segments in the guides will now be quite evident, and you should try it with both settings to see the effect. Open up the Dynamics tab and the Properties section. We'll refer back to this area a lot, using it to help us style our hair.



12 In the Dynamics Properties, increase the Rest Mix to 25% and play forwards again. Now although the hair has fallen, it retains some of that ability to stay upright, which we need for this particular style. From the Hair menu, select Palette to make all the hair styling tools available for future steps, and select Set As Dynamics to fix the hair into this more relaxed position.



13 Select the Brush tool, and check the Colliding option in the Brush Attributes. Now rotate the viewport around to the side, and start clicking and dragging the brush's circular cursor from front to back, pulling the hair guides backwards. Try to lift them up slightly approaching the back, so that the rear of the hair gets lifted.



14 In the Hair Palette, click and hold on the Brush Tool to display the secondary Hair Tools dropdown - select the Cut Tool. Again, using the cursor, make a smooth sweep up and away from the back of the head to reduce the hair's length closer to the neck. Be sure to keep rotating around the hair to catch any stray strands.



15 Once happy with the style, select Set As Dynamics again to fix this rest state. Playing forwards now will retain the basic style changes, but there will still be a little play in the movements. Experiment with the Rest Mix and Rest Hold options in the Dynamics tab to see how the style can be retained and move dynamically.

STAGE FOUR | Making the material



16 A quick screen render will reveal just how far there is to go! Double-click the Hair material to open the Material Editor. The first thing to look at is the Thickness - it's too thick by default. Reducing it to 0.1m at the Root, and 0.02m at the Tip seems to do the trick.



17 The hair roots, although thinner, still don't connect to the scalp in a realistic way. There are a number of ways to fix this, but we decided to edit the Thickness curve, so that the hair starts very thin, and quickly ramps up to our base settings. The result definitely looks more natural.

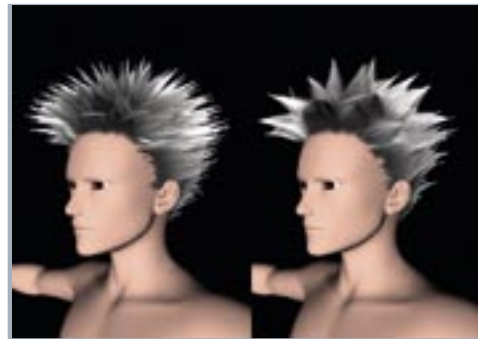


18 The kind of anime hair we want to create isn't soft and nicely separated, so use the Clump function to bring it into pointed groups. Set Count and Clump to 100%, take off any Variation (we don't want stray hairs outside these group) and do a test render. Add a few degrees of Twist to make it look more natural.

STAGE FIVE | Thickening the hair, wind setup and female hair



19 Now alter the colour to something more suitable. Select the material's Color channel, and define the gradient so it goes from a dark grey to silver grey. There obviously aren't enough hair strands at the moment, so switch back to the Hair object in the OM, and change the Count to somewhere between 20000 to 40000.



20 More hairs take longer to render, but give a more faithful anime look. The hair looks much fuller, but it's clear that such physical hair creates an increased number of slimmer clumps. You might want this, but if you'd prefer to retain the bigger clumps, keep the lower hair Count and use the Fill Hairs option instead.



21 The effect is starting to shape up now, but there are still a few issues to take care of. For a start, some of the hairs are intersecting with the head. To fix this, simply adjust the Offset in the Roots section of the Hairs tab from 0 to 0.3 to pull the intersecting hairs out from inside the head.



22 Now we have the overall look we want. It's time for a final bit of styling. Activate the Symmetry option on the Hair palette and, with the Brush tool, pull some of the front guides down and forwards on one side. The Symmetry function will do the same to the other side. Make sure to Set As Dynamics to freeze the styling.



23 Lights help to define and sell the hair, so create a targeted spotlight, moving the target up to the hair area, activate soft shadows, and, from the File menu in the OM, select the Light Tag from the Hair Tags sub-menu. Increase the Shadow Map size in the Light Tag to about 750. Otherwise the shadows don't show up enough.



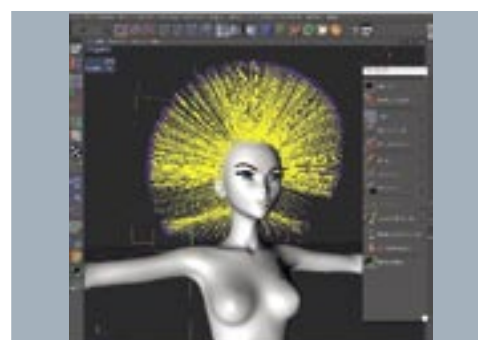
24 The ultimate aim of this exercise is to create hair that can be used in an animation, so we want it to move about and react when it's blown by a breeze. Hair will respond to the standard particle force effectors in C4D, so select Wind and Turbulence objects from the Objects > Particle menu



25 Ensure that the forces effectors are scaled up to encompass the hair. Open the Forces tab of the hair object and drag both effectors to the Include field. The standard speed setting is probably too weak, so to suggest gusts, add keyframed variations (from 50 to 400) along the timeline. The Turbulence object creates random bristling. Set it lower down the scale at about 25-50.

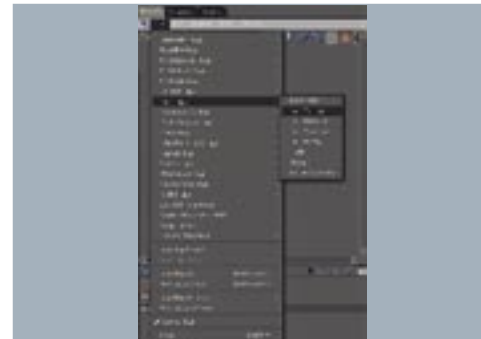
EXPERT TIP

Movie renders
Playing the animation in the editor will provide a good preview, but for greater accuracy always use the Render In Editor option. This better illustrates how your hair will actually move. In the Editor tab of the Hair object, you'll find a number of ways to preview the hair without actually having to do a full render. Switch up from Guide Lines to Hair Lines, for instance, and you'll get a much more accurate depiction of the shape of the cut and the way it moves. This option takes all of the material settings into account as well as the basic hair object parameters. It also renders quickly!



26 We may need to apply some slight tweaks to the hair forces setup in the final animation, but in the meantime we need to set up the female character's hair. We've already prepared the Aiko model on the CD with suitable textures, created a hair selection area, and applied the hair to the model. With this particular style, we don't want the hair as spiky or as clumpy.

STAGE FIVE (Continued) | Thickening the hair, wind setup and female hair



27 With longer, more flowing hair, there's more chance for intersection with the mesh, so this time we need to apply a Hair Collider Tag to the base model. This can either detect all collisions over the entire base object or, by using Hair Selection Tags, restrict it to particular areas to save calculation time. Alternatively, place primitive spheres inside the head and shoulders with Hair Collider Tags applied.

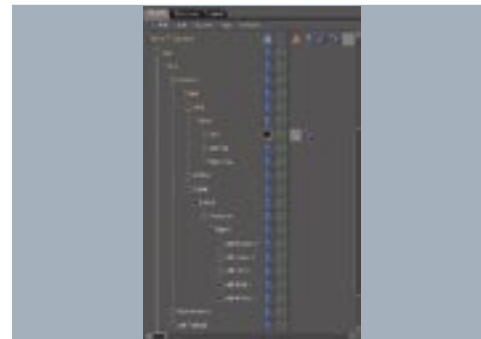


28 As before, let the dynamics shape the initial hair as it falls and settles, but this time use more guide/hair segments. Click Set As Dynamics and start styling. First, select the front strands with the Hair palette's Live Selection tool, and use the Cut tool to trim the fringe a little. Finally, use the Move tool to part the two sides of the fringe.

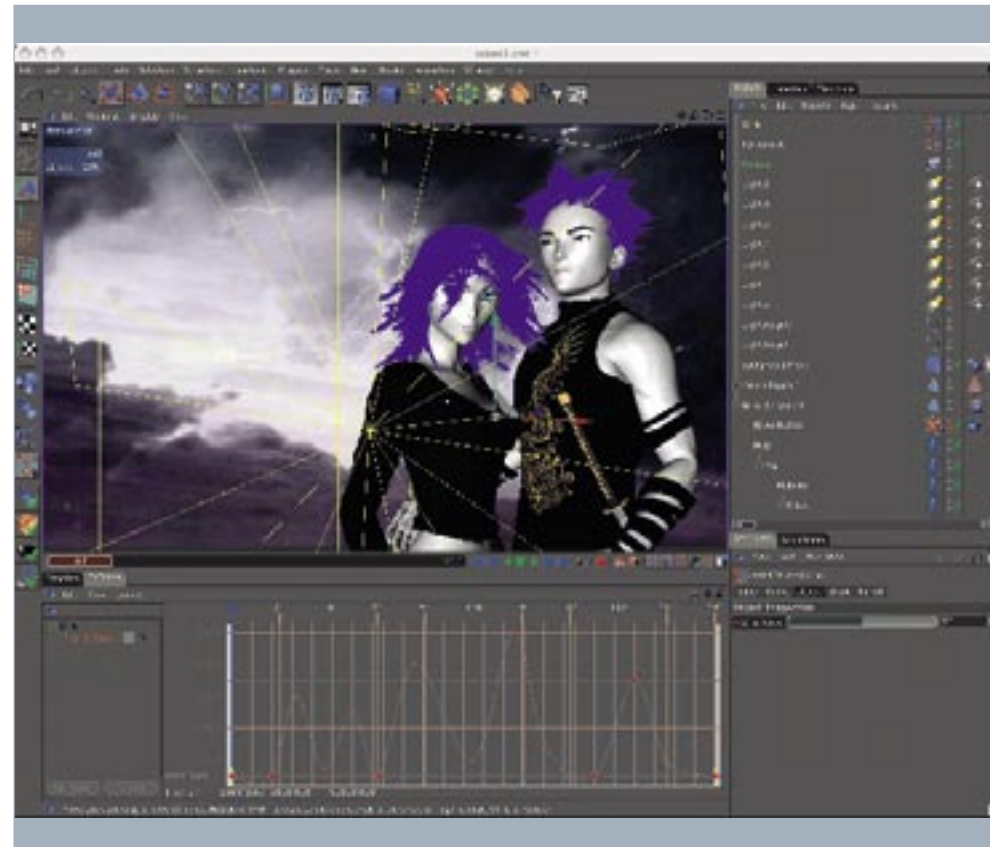


29 Next, edit the hair material. Set the colour gradient from a dark purple/black, through purple/blue, to lilac at the tips. Clump is used here again to gather the hair into striking spikes. This looks OK, but a tiny bit of Frizz to soften, and some Straighten with an adjusted curve, to make the straightening effect grow towards the hair end, helps to lift and stylise the hair.

STAGE SIX | Final animation setup & tweaks



30 Finally, move each Hair object inside the base figure's hierarchy as a child of the Head object. Otherwise, when you move your characters, the hair will remain where it is, leading to a potential comic moment, but probably not one that was actually intended.



31 Once we've posed the characters and lit the scene, it's time to add the wind and turbulence effectors, and keyframe those random gusts in the wind speed (aim for something similar to the wind's F-Curve in the screenshot above). Finally, animate a camera targeted at the couple, rotating it around and in front of them, as in a classic anime shot. You can find a version of the scene

with everything set up for you (Animation Scene.c4d) on the CD for you to load in. The rendered animation itself can be found on the Stop Press section of the 3D World website, www.3dworldmag.com/stoppress. That concludes our exploration of the strange world of anime hairstyles, but be sure to experiment with the Hair module's other settings for yourself, to see what results can be achieved. ●