

Review of Makehuman 0.9 – November 08 2006

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www.Makehuman.org

I think Makehuman is a big advance in terms of 3D applications providing ready to go tools (as opposed to immense power that's hard to penetrate). When an application delivers automatically what others force you to spend days setting up and tweaking, it can come over as amazing that the big players don't provide more.

Anyway, these are some features that grabbed me before I opened it, when it was featured on www.cgchannel.com, a website regularly showcasing what's new in CG.

-Makehuman has autoskinning.

-Makehuman has automatic UV mapping of the whole human character.

-Makehuman can do male and female characters, coming with several presets.

-Makehuman exports its model results as .obj

-Makehuman is not expensive – in fact, it's freeware (or donationware).

Most freeware software has certain limitations brought on by the authors having to work from their own blood, sweat and tears. So while the program at the moment has faults, it's still an impressive result.

These are various misgivings (and I may be wrong about some things, in which case I'll be happily corrected, bearing in mind I know 3DSMax processes and may have overlooked key details because of ways I'm used to navigating software):

There are few interface tooltips or explanations, so the best way to figure out what things are for is to try them out. Tooltips for command icons show at the bottom of the view. I suppose that, all in all, it only takes about three hours to get really comfortable using this software, given its purpose is fairly focused.

The export feature waits till you hit enter, but without a prompt.

It would be great to be able to zero out a morph value using right click (like in 3DSMax) particularly in cases where you can slide below zero, such as poses.

A big problem is the moused viewport navigation. It would benefit from a mod-like shift-click to reset orbit to the closest orthographic angle.

A related problem is the apparent lack of focused area framing (like when you select the eye tools it would be nice to frame to the eye optionally). It would make sense to have this because to edit the facial detail one needs to see the area of concern better.

However, one can zoom using + and – on the numeric keypad, or shift+= keys and -key (not using shift). You can use the arrows or numeric keypad to both roll the view and pan, and set the view to front (1), left (3), and top (7).

You can limit the view roll to one axis using the numeric arrows (2,4,6,8).

You can pan using the keyboard's specific arrow keys.

I found honing into an area from the larger view to show a detail took longer than it does in a usual 3D viewport, which is a big workflow issue these days.

A render icon is available, but it looks like it's to be hooked into external software. Some more subtle issues that technical artists will be familiar with follow: Makehuman assumes a certain kind of character form in terms of its eye and mouth definition. The model has teeth and a tongue but has taken conventional shortcuts with internal mouth definition. The tongue is not joined to the mouth cavity. When you open the jaw and zoom into the mouth you can see there is no mesh under the tongue behind the teeth. Although Makehuman has automatic UVs, there can be trouble with this because in 3DSMax the UVs are not welded. Actually, when I zoom in on the character in Makehuman it seems around the mouth there are unwelded faces, particularly the teeth and lips, eye corners and nose. Maybe it's a display property – at this point in time I don't know. I checked in 3DSMax whether the geometry faces are welded by moving them about individually, and it seems okay. But there is definitely an abnormality about the UVs. Still, if you are happy with Makehuman's UV template, then it won't matter. Most artists would want to check the UV layout before painting a given character. While playing with the character I noticed there is a triangle of two untextured faces on the sternum of the character. Perhaps there is a reason for that, but I'm not sure.

It's rather clever and passingly amusing how the male and female genitalia morph. There are a surprisingly large number of morphs for the male pudenda (crazy old style word for the goods) but none for the lady's. The default character has a passable male chest but female pelvis – I had to play with 5 chest morph values to raise and broaden the pectoral muscles (first trying out many additional morph values). A male OR female starting choice would help.

Something I would like to see in Makehuman is morph symmetry toggle and also a morph baker which saves a bunch of morph values to a user morph slider (ie, my five different chest values). There's an asymmetry icon in the top bar but it seems to be a feature that isn't implemented yet. Clothes and hair are not implemented. You can make 'sort of' clothes in the 'fantasy' set of morphs by extruding faces in the mesh, which might work in some low detail game character building. Also, I noticed on the developer forum an example of how hair may look in future releases.

Eyelashes are included but they seem mostly to get in the way. As suggested in the tool icons there may be extensions to the software to include clothing and hair, but I suspect first there will be an overhaul of some existing features. There is a morph in each eye control for pushing the eyelashes back into the head, a nice way to get round deleting them. Of course, you can just delete features you don't like in 3DSMax after export. The eyes are slight bulged half-spheres, so you might want to replace them with perfect spheres if you are nervous about eye rotation centers.

I was looking at Makehuman with some of my students and we were thinking about monster building and found a picture in Monstruo by Carlos Huentel of a monster with an arm coming out of his head. Makehuman can't generate an arm coming out

of the head, but you could make a monster figure, shape an arm on another figure and then export it and detach it in 3DSMax and add it onto your monster.

About autoskinning :- Before you get excited about the chance to skin your generated human mesh to your CAT or biped rig in 3DSMax, which is what I supposed autoskinning meant, it's important to understand that the skinning is only within Makehuman's morph reaction system. Essentially there is a large library of angle based morphs (which is why when you rotate the foot into a Pose the calf automatically bunches). The developers have a great video about it on their website.

In the poses tab of Makehuman you can rotate the limbs and see the effect of the autoskinning. It isn't perfect however, and really musculature change based on morphs which also change the general proportion of the muscles as well as their firing is going to be a very hard proposition to master over a whole character.

In Makehuman there is no reset for the limb rotations you apply, but if you go out of pose mode the model snaps back to the setup pose (the T pose).

A small point: Looking at the wrist rotation one can see that compression of flesh is favoured over stretching, which looks strange. Try turning back the hand and watch the mesh in the area where people cut their wrists – it doesn't tug the arm flesh. Users can't go about correcting or customizing the morph library. I could go on listing tiny problems with the morphs – like which vertices might be better captured by the shoulder blade when you pose the arm – but that would possibly get in the way of the fact that things overall work really well, and anyway, you are only posing the character to ensure the muscles are deformed approximately correctly for the pose you want to export. Any actual skinning for animation is still going to be done in 3DSMax or whatever program you favour.

It would be wonderful if you could import a CAT rig into Makehuman, set it in place, and then apply the skin data, and then reapply that in 3DSMax. However, such a great union of two cool tools would require some heavy work.

To set up the number of angle-based deformations that Makehuman has on a freshly skinned 3DSMax character would take a great deal of time, especially given you'd have to do it every time with a new character. All Makehuman's generated meshes are based on the same source model, so the angle-based deformations will always work (though I'm sure they favour a realistic human variant than a really monstrous fantasy creature variant). They provide great power to the user for only a donation (if you're not mean or lacking Paypal in which case it's free).

It's interesting and impressive that a free tool is available to provide this functionality when the major 3D applications hardly cover the area (although admittedly the tools exist in 3DSMax if you want to do lots of hard work).

A final comment, is that compared to Poser, a much more mature product, Makehuman is still an infant, but already I think I can get from it a nicer personalized human than Poser for a real-time project.

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