

An up-to-date look at free software and its makers

PROJECTS ON THE MOVE

Free software enjoys an excellent reputation in the field of 3D graphics. In addition to Blender, other projects stand out: MakeHuman creates realistic 3D humans, and Art of Illusion – with its intuitive interface – lets users enter the world of animated movies. **BY CARSTEN SCHNOBER**

Although the free 3D program Blender [1] enjoys an excellent reputation for its performance in the free software community, other programs can compete with Blender in some aspects of 3D rendering. Blender's quirky interface has confused newcomers. The program assumes familiarity with fairly unintuitive icons and keyboard shortcuts; in fact, in terms of usability, Blender is very much a child of the 1990s.

Without doubt, learning Blender is worthwhile – as animated movies such as *Elephant's Dream* [2] and *Plumíferos* [3] provide ample evidence. *Peach* [4] is another major Blender project that will be released under a free license, just like *Elephant's Dream*.

Despite this, usability is an aspect that one simply can't ignore, and Blender does not do well in this field.

Making Humans

As I mentioned earlier, other free programs besides Blender play a role in the world of 3D computer graphics. MakeHuman [5] is specifically designed for modeling humans.

The program is written in C++ and is available for Windows, Mac OS, and Linux. Users with distributions other than Mandriva will not find prebuilt binaries and thus need to build the program from source code.

MakeHuman comprises three sub-packages. In order of installation they are: Animorph, the graphical interface Mhgui, and the MakeHuman engine. The current version of MakeHuman is 0.9.1. The interface is far friendlier to users than the Blender counterpart, and if you are looking to shape your virtual dream body, MakeHuman will help you do so quickly.

The MakeHuman start screen shows a raw human model that can be manipulated with the use of four two-dimensional controls. These channels specify biological characteristics that affect the physiognomy of the model.

The top control *Age/Sex* sets the age and aspect of gender-specific body features. Below this, the *Body Mass* channel defines the muscles and weight. The

Breast control defines the size and shape of the breast, and *Body Shape* lets the modeler define the 3D model's figure and size.

Channel interlocking ensures realistic human shapes. If you choose a female figure in *Age/Sex*, the weight control below *Body Mass* will affect typical "problem zones." The shape of the breast also depends on the age and weight.

Details

After you define the basic parameters, it's time for fine tuning. Many other body parts can be custom designed. The face area supports granular modeling of seven individual parts, such as the nose, mouth, and chin. However, not all of the manipulation options work in the current version. Although you can select fingers, teeth, and the tongue, there is no way of manipulating them.

The MakeHuman interface, dubbed Tetrawidget GUI by its creators, allows





Figure 1: MakeHuman accesses existing rendering software to create a realistic image from the 3D model.

users to model amazingly realistic-looking humans in a short time. The programmers estimate that the program is capable of precisely modeling some 90 percent of human physiognomy.

On top of this, MakeHuman has a natural pose system that simulates realistic movements. Controls are similar to those for modeling bodies. Clicking a body part opens a set of icons that enables movements of the muscles in the area. Again, the program supports a range of effects such as rotating the whole upper torso to moving individual fingertips.

Into the Wild!

After constructing a model, the next step of the 3D computer graphics workflow is the rendering process, which, taking light and shadow into account, creates a realistic image from the model (see Figure 1).

make MakeHuman even more interesting thanks to further innovative controls. Although the current interface removes hurdles for users wanting to model realistic 3D humans, the next version will have 3D widgets that support the use and ongoing development of the graphical interface.

The developer team welcomes contributions to its work. Designing the new interface will need a good deal of effort and brain power and even crazy ideas, as the developers' blog reveals.

Art and Illusion

Now you've created a virtual human, what are you going to do with it? The obvious thing to do in virtual reality would be to work on refining the 3D model. If you save a model in MakeHuman, it ends up in a *makehuman/myobj*s folder below your home directory. Almost any 3D program will recognize

Wavefront's OBJ format, including the proprietary Maya and 3ds Max (formerly 3D Studio MAX) tools and also Blender. But one of the alternatives to the complex Blender that will not break the bank is the free 3D program Art of Illusion [8].

Art of Illusion's main claim to fame is not that of importing Wavefront objects. If you have created a 3D model with MakeHuman or any other software, you can use Art of Illusion to create your own custom objects. The Java program is available not only for Linux and other Unix-style systems, but also for Win-

dows and Mac OS X. Maintainer Peter Eastman regards a user-friendly interface an important goal.

Eastman, who is the author of the humorous text adventure *Episode in the Life of an Artist* [9], started developing Art of Illusion back in 1999 because he found the 3D graphics programs available at the time unintuitive – independent of their price tags.

From the outset, the physicist Eastman has regarded his work on Art of Illusion to be a leisure project and not competition to other free 3D programs. He also sets much store by open development, which can be followed in the project's public discussion groups on the website.

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Camera

Besides imported 3D objects, or those created natively in Art of Illusion, the program also offers a light source and a camera that can be moved and aligned by drag and drop. The default view comprises four panes that depict different perspectives of the scene. By default, the front view is top left, with the left side to its right and a bird's eye view bottom left. Bottom right shows the area at which the camera is pointing. This allows users to monitor how changes to objects or the lighting affect the scene.

The Art of Illusion interface uses well-known concepts popular with movie editing programs to create animated sequences. The timeline lets users select individual frames directly; it also supports a clear-cut view of animations. One of the neatest features is the system that automatically calculates movements with the help of an artificial skeleton and virtual muscles. ■

INFO

- [1] Blender: <http://www.blender.org>
- [2] Elephant's Dream: <http://www.elephantsdream.org>
- [3] Plumiferos: <http://www.plumiferos.com>
- [4] Peach: <http://peach.blender.org>
- [5] MakeHuman: <http://www.dedalo-3d.com>
- [6] RenderMan: <http://renderman.pixar.com/products/whatsrenderman>
- [7] Aqsis: <http://www.aqsis.org>
- [8] Art of Illusion: <http://www.artofillusion.org>
- [9] Episode in the Life of an Artist: <http://wurb.com/if/game/2159>