

# gamedeveloper

THE LEADING GAME INDUSTRY MAGAZINE

## SKUNK WORKS

OUR RATING SYSTEM :

🐻🐻🐻🐻 DA BOMB

🐻🐻🐻 PRETTY SLICK

🐻🐻 SLICK

🐻 SO-SO

🐻 LAME

## CLAYTOOLS SYSTEM 1.0

BY JAMES ALGUIRE

### CLAYTOOLS SYSTEM 1.0



#### STATS

**SensAble Technologies, Inc.**  
15 Constitution Way  
Woburn, MA 01801  
781-937-8315  
www.sensable.com

**PRICE**  
\$2,795

#### MINIMUM SYSTEM REQUIREMENTS

Intel Pentium single 2.0GHz or Dual 933MHz or faster CPU, 1GB RAM, FireWire port (IEEE—1394), qualified graphics card.

#### Operating Systems.

Windows 2000 SP3 or SP4, Windows XP Professional SP1 or SP1A.

**Software.** Autodesk 3DS Max version 6 or higher, or Rhino. (Maya-compatible version due out soon.)

#### PROS

1. Short learning curve.
2. Excellent control for manipulation and navigation.
3. Fun to use.

#### CONS

1. High price point and weak documentation.
2. Users may need to add Firewire card, as some PCs do not have them built in.
3. Works with a limited number of 3D programs.

IMAGINE IF CREATING COMPLEX 3D models for cinematic effects or game projects were as easy as sculpting a lump of clay. Wearing virtual reality gloves, you could reach into a holographic display and simply grab a primitive object and start molding, pulling, smoothing, and even animating fully realized 3D objects with the same ease of kids playing with Play-Doh.

That vision is closer than you think, thanks to SensAble Technology's ClayTools System 1.0. Available since March, the ClayTools hardware/software combination incorporates haptics (the study of technology and the sense of touch) to bring the sense of touch to creating, modifying, and animating 3D objects.

ClayTools is currently available for Autodesk's 3DS Max and Robert McNeel & Associates' Rhino, with a version for Alias' Maya scheduled to ship this month. This review focuses on the 3DS Max version.

#### A TOUCH OF CLASS

Being able to virtually touch and feel 3D objects can potentially improve the efficiency of existing 3D development workflows and make 3D development more accessible to artists eager to enter the digital realm but daunted by the complexity of existing tools.

The Phantom Omni Haptic Controller (the hardware component, see image) consists of a stylus attached to what appears to be the shoulder and arm assembly of a robot. Using it is like drawing in the air. The Phantom Omni has six axes of motion: up/down, left/right, forward/back, and three rotations, which provide a surprising

range of movement for manipulation, suitable for either right- or left-handed people. Two buttons activate various software functions or act as standard mouse buttons. It can be slightly awkward to use the Phantom Omni to perform standard mouse controls. Several times, I had to perform some hand-based gymnastics to get the cursor to reach the menu item I wanted to access. But it's the built-in force-feedback capabilities that make working in 3D wholly new.

The bundled software includes Windows drivers for the Phantom Omni Haptic Controller, the HapticExtender/MX plug-in for 3DS Max, and SensAble's own ClayTools 3D Modeling software. The installation procedures provided in the printed manual and the PDF documentation on CD-ROM differ somewhat, which can cause needless confusion and can easily stall the user from getting into the tool.

And once you're all set up, you'll also need to give yourself a clear area—about 12 inches on either side of the Phantom Omni—to avoid damaging the device by bumping into objects. Another much-needed hint: Move the Phantom Omni out of the way when not in use to avoid catching the stylus on shirtsleeves and elbows.

#### FEET OF CLAY

I found the ClayTools software to truly be as easy to use as advertised. Instead of having to deal right away with the technical aspects of modeling, spline construction, or Boolean operations, I simply grabbed a primitive from one palette and a tool from another and started the 3D creation



The Phantom Omni Haptic Controller hardware, used with ClayTools, mimics the physical properties of clay by creating resistance.

process. The force-feedback features let you feel the objects that you're creating. Pressing against a 3D object causes resistance in the Phantom Omni as if you were pressing against a real object, making it almost feel like you're working in real clay. Different tools can carve, pull, and smooth geometry with incredible ease. The size of the tool used and the hardness of the virtual clay are easily adjusted on the dynamic toolbar, or better yet, using keyboard shortcuts. It took about 20 minutes to rough out a humanoid head with basic features in ClayTools when a similar project would have taken me a couple of hours or more in another 3D program—and the process was actually fun.

The simple and uncluttered interface organizes tool functions and primitives within floating palettes, and settings can be adjusted in the dynamic toolbar. The status bar below the toolbar provides additional information whenever the cursor is positioned over a tool or function.

The Phantom Omni also gives a whole new (I daresay more natural) feel to navigating the 3D space and changing

the view of 3D objects being modified. You can turn a 3D object around with just a turn of the hand or twist of the wrist. You can start the modeling process in 3DS Max and add detail to the models in ClayTools, or you can create detailed organic objects in ClayTools to render and animate in Max.

SensAble provides PDF documents outlining the process of moving between Max and ClayTools. Once you understand the process, you can create low-poly 3D objects suitable for use in video games with levels of detail that would be difficult to achieve using other methods, and in many cases, in less time.

## EXTENDING YOUR REACH

While the Phantom Omni can replace your standard mouse for 3DS Max, a plug-in (the HapticExtender/MX) can also add to Max many of the cool force feedback features that you find in ClayTools. Actually touching the 3D models as they are created brings a whole new dimension to the program. You can work by touch outside an object, or with a gentle push, you can punch through and work from the inside of an object, again all by touch. You can even make true 3D selections by following the geometry of an object by feel.

Collision detection allows you to place objects on or in other objects with ease. Putting a tool into

a game character's hand becomes a much simpler task when the tool stops moving once it's in the hand. This also comes in very handy when animating. But collision detection isn't limited to objects in 3DS Max. The Phantom Omni also detects the edges of the viewport you're working in, requiring a bit of extra effort to move between viewports. This takes some getting used to and was somewhat annoying at first.

To activate the Phantom Omni's force-feedback enhancements in 3DS Max, click on the Utilities button and then the More button. Select HapticsExtender/MX from the Utilities list and click OK. The Utility Panel displays parameter roll-ups for modifying the behavior of the Phantom Omni device. You can adjust for friction (making objects more or less slippery), touchable range (how far the Phantom Omni reaches in the 3D space), and selection behavior.

Expect to spend a few days using the Phantom Omni device with ClayTools and the HapticExtender/Mx plug-in to become familiar with the nuances of force-feedback modeling, but once you get the hang of it, you'll wonder how you ever worked without it.

## THE FINAL TOUCH

The documentation provided with the ClayTools System is adequate, but feels like it was the last item on the list to be completed. The bulk of it is

electronic, either as PDF documents or html-based help files. You'll definitely want to read through the help files, as they provide a good rundown of ClayTools' different functions. Game developers will especially want to become familiar with the workflows for moving between ClayTools and 3DS Max. The workflows do assume that users are well versed in Max and could be confusing for newer users. I would prefer to see the documentation amplified somewhat to give more detail while explaining the process of using the ClayTools System.

SensAble's application of haptics technology brings virtual reality to the mainstream of 3D modeling and has created, in my opinion, a worthy successor to traditional mouse control in 3D applications. The pricing is geared toward the professional 3D market, so it's a bit high for individual use. There are still a few wrinkles to iron out, but for a version 1.0 product, ClayTools is definitely one of the easiest 3D programs I've used. Once you've tried it you'll agree, no other tool gives 3D the same feel.

**JAMES ALGUIRE** is a Mac professional and Apple Certified Trainer with more than 20 years experience in the computer industry. You can email him at [jalguire@gdmag.com](mailto:jalguire@gdmag.com).  
at [jilloyd@gdmag.com](mailto:jilloyd@gdmag.com).

