Image courtesy of Naughty Dog

Maya Meets Needs of Next-Gen Game Development

By Audrey Doyle

Naughty Dog is harnessing the power of Autodesk Maya to create an all-new franchise for the Sony PlayStation 3.

The artists at Naughty Dog are skilled at meeting the challenge of developing games that take full advantage of the unprecedented power and graphics capability of next-generation consoles. That's not surprising, given that they have plenty of experience in that area: with each new generation of the Sony® PlayStation® game console, they've developed a brand-new franchise that was optimized to harness the hardware's potential, starting with their Crash Bandicoot series for the PlayStation 1 in 1996, and then moving on to their Jak + Daxter series for the PlayStation 2 in 2001.

The impending release of the Sony PlayStation 3 (PS3) this fall has the Santa Monica, California-based team working on their third new franchise, which they say will continue their tradition of developing third-person action games that take full advantage of next-generation hardware capabilities. To develop the content for this new franchise, the team is relying on the advanced capabilities in Autodesk Maya 3D animation software.

"As game hardware has evolved over time, so has Maya, whether it's through the features the software offers or through our ability to customize the software to meet our needs," says Evan Wells, Naughty Dog co-president. "One of the things we were concerned about when we started to develop

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this game for the PS3 was that because of the hardware's capabilities, the environments in this game could be much larger and more realistic, and the graphics and characters could be much more realistic and complex, than those we developed for previous-generation systems. We were happy to see that the evolution of the hardware hasn't prevented us from achieving the level of detail we want to achieve in Maya."

The hero character of this as-yet-unnamed game is a treasure hunter who finds himself stranded in a jungle on an island as he searches for a highly valuable, long-lost cache of historical significance. Given the game's setting, one of the things Naughty Dog is focusing on is creating extraordinarily lush and highly detailed backgrounds.

"Our backgrounds are very complex," says lead modeler, Rob Adams, who adds that one of the biggest advantages of Maya in this regard is the fact that its intuitive user interface is clean and fast. "The user interface's marking menus in particular, which we use for all sorts of modeling procedures, allow us to work very quickly," he notes.

The user interface also is fully customizable, thanks to the renowned Maya Embedded scripting Language (MEL). In fact, MEL scripting has come into play in several areas of development on this project. For instance, with a MEL script the modelers were able to create a reference node interface tool that they're using to quickly and efficiently place and organize instances within the game's environments, thereby enabling them to incorporate thousands of objects into their scenes. "With the PS3, the level of detail and the quality of that detail have gone up tenfold compared to what was achievable in previous-generation systems," Adams says. "Maya lets us take advantage of all that power."

In addition, the team has used the Maya API/SDK to write file translators that make working with their game data a breeze. "It's easy for our programmers to work with the Maya data format and to write tools that allow us to use the power of the PS3 to its full advantage and get a larger quantity of more detailed and complex graphics on the screen," Wells states.

Meanwhile, Mel, the scripting language in Maya, has been a boon to lead animator, Jeremy Lai-Yates. "As an animator, I'm not very technical, so I don't know much about scripting. But I have been using Mel a lot," he says. "If I find myself doing a repetitive task, it's really easy for me to turn that task into a macro to save time. Mel, the scripting language in Maya, is powerful enough to meet the needs of our best programmers, but it's also easy enough for someone like me, who has no technical background, to get a lot out of it."

Another robust feature that has proven helpful in this project is the software's rigging capabilities. As Wells explains, "The game's hero character isn't your typical commando or space marine. He's much more fallible and gets by through tenacity and, sometimes, by the skin of his teeth." As such, the animators have been challenged with the task of showing that level of struggle and emotion through the character's body and facial animation.

Toward that end, Lai-Yates says the Maya rigging tools are second to none. "The software's rigging capability is one of the best—if not the best—in the industry," he enthuses. "We can pose the character, and actually sculpt the poses, very interactively, quickly, and efficiently."

It's this high level of speed and efficiency that the team values most about Maya. "That's really what it comes down to: how fast you can create the content which, because of the hardware's increased capabilities, can be more detailed and complex than ever before," says Adams.

And in this task, Maya has never failed to please. "At the start of this project we had to take a hard look at our pipeline and make it as efficient as possible so that we could create the high quality of content that this next-generation platform will be capable of supporting," says Lai-Yates.

"That's why we're using Maya," concludes Wells. "As game consoles have increased in sophistication, Maya has consistently demonstrated that it can meet the challenges next-generation platforms can present to game developers. There's no reason we'll be moving away from Maya as our primary content creation tool."

Image courtesy of Naughty Dog

BOX INFO:

—**Workstation make and model**: Intel® Pentium® D Dual-core systems

—**Graphics card**: Nvidia Quadro® FX 4500

—**What performance benefits did you realize as a result of your workstation configuration?** Since we hand-build every workstation in-house as per the needs of individual users, this workstation configuration has given us the ability to tweak performance settings and get the most out of Maya.

—**What specific features or functionality of your graphics card helped you accomplish this project?** Utilizing the latest in Shader 3.0 technology we've been able to visualize what our next crop of high-definition video games will look like on the leading generation of gaming consoles.

—**In what ways did Maya excel as a result of your underlying system?** With the advancement of PCI Express, SLI, and more on-board memory we have been able to import massive scenes [and] character rigs and animate in real time, which were thought undoable with the last generation of hardware.

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