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Osaka, Japan

Autodesk® 3ds Max® software

Autodesk® MotionBuilder® software

Autodesk® Softimage® software

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—Toshiyuki Kamei
Art Direction
Dimps Corporation

STREET FIGHTER IV

Taking in to the Streets

Capcom Gives Next Generation Visuals to a Fighting Game Classic.



Image courtesy of Capcom Co., Ltd.

Summary

Capcom's *Street Fighter* series, a pioneer in the fighting game genre, recently celebrated its 20th anniversary. Released across many platforms, the franchise is a worldwide hit with over 500,000 arcade units and 27 million copies of the home software sold so far. The series' latest title, *Street Fighter IV*, was developed as part of a project to mark this 20-year milestone. After almost a decade since the release of its last installment, *Street Fighter III*, fans around the world greeted the new arrival with great anticipation. The arcade version was released in June 2008, followed by versions for PLAYSTATION® 3 and Xbox 360® video game and entertainment systems in February 2009.

While *Street Fighter IV* keeps the gameplay and distinctive characters for which it is famous, it adds mind-blowing, next-generation visuals, a move sure to appeal to fighting game enthusiasts, past fans of the series, and everyone in between.

Dimps Corporation was involved in all production stages of Capcom's *Street Fighter IV*. Autodesk interviewed the development team members to see how they used Autodesk products to work their magic.

The Challenge: Bring 2D art designs into 3D

The project began when designers at Dimps' development workshop were handed a series of scanned sketches and drawings from Capcom's Art Director, Daigo Ikeno. Their mission was to take the scans and create "the best quality images that can move in 3D". More specifically, they needed to reproduce the nostalgic movements and atmosphere of the 2D animation era while at the same time create

next-generation graphics that had never been seen before. In the end, they managed to create graphics that went beyond the expectations of even the most devoted *Street Fighter* fan.

The Solution

After the concept designs drawn by Ikeno were sent to the development workshop, the 3D designers got to work. Toshiyuki Kamei explained how the team members used Autodesk® Softimage® software (formerly SOFTIMAGE®|XSI® software) as the main tool for character modeling and character animation. In the initial modeling process, they found the Softimage Tweak Component tool and proportional modeling particularly useful. Kamei said that thanks to these features, the team members were able to model characters in an intuitive way that was reminiscent of shaping clay, creating modeling data for over 25 characters, each with two sets of clothes.

When developing the texture of the graphics, the team created a real-time shader based on a mental ray® software image prototype they developed on the Autodesk Softimage Render Tree and FX Tree. FX Tree is a 2D compositing feature which the team said was helpful not only for compositing with backgrounds, but also for material compositing with shader elements. A shader prototype was created on Render Tree using a graphical user interface (GUI). This enabled the designers and programmers to operate with the same mindset, meaning that instructions for graphic processing, which usually tend to become abstract, could be communicated more clearly between them.

The main characters were controlled with a basic rig structure that had the same inverse kinematics (IK) base. The team used secondary control rigs, such as control when the characters extend their hands or when their clothes shake. Setup work was performed smoothly thanks largely to the Softimage “envelope weight adjustment” feature. The workflow consisted of first adding a rough weight value area, and then performing fine adjustments by entering numbers. As a result, the envelope settings for a large number of characters were completed on time.

The Generalized Attribute Transfer Operator (GATOR) was instrumental in helping reduce the setup work for facial rigs. Softimage® GATOR technology was used to transfer the properties and attributes of an object to another object in just a few clicks. First, the team members saved rig data for the lead character, Ryu, which used 54 bones, on the server. Then, when they wanted to set up a rig for another character, they loaded Ryu’s facial data, aligned its size and applied Shrink Wrap. Then all they had to do was run GATOR. Normally, creating the basic facial setup for a character takes as long as three days, but with GATOR the team reduced this work to about two hours.

The team members relied on the Softimage “reference model” feature when they needed to interchange existing rig and model data with that of new models. Kamei explained, “We often had to change the model data even while the project was underway. Under such conditions, using GATOR to efficiently reuse our existing data had a dramatic effect in shortening work times and improving quality. In addition, the reference model enabled a work pipeline in which modeling and animation could be performed in parallel. This pipeline was like a dream come true.”

For animation, the team members used an IK based rig that could be used universally for all the characters. This rig was developed for the control of basic body parts, with additional rigs developed separately for facial movements using scripts. They then added functions suitable for the rig type, such as importing the latest facial data saved as an Animation Mixer clip on the server, or editing with slider blending values.



Image courtesy of Capcom Co., Ltd.

In character animation, reproducing movements from the 2D animation era as 3D was a key goal. For this reason, in addition to determining character movements with pure IK, the team members also added deformed animation for the hands, feet and faces. In the cut scenes, control was performed using an expression slider both for the facial rig, which required a wide variety of expressions, and for the hands, using finger movements. For lengthy scenes leading up to a fight, the team used motion capture, importing data from Autodesk® MotionBuilder® software into Autodesk Softimage.

After putting it through its paces, the head designers chose Autodesk® 3ds Max® software as the main tool in the background production pipeline for the *Street Fighter IV* project. For them, the deciding factors were the higher quality of radiosity during render map creation, greater ease of managing large-volume materials, and the customized environment for output data. But it was the higher stability and greater speed of the real-time viewing environment using custom shaders that really won them over.

The Results

Street Fighter IV character models, animation and environments were created in Autodesk Softimage and Autodesk 3ds Max, then converted and output directly to the console. The game production was performed in a PC-based, multi-platform development environment that was compatible with both the Xbox 360 and PLAYSTATION 3. This meant artwork created in Autodesk Softimage and Autodesk 3ds Max could be checked immediately in its final game condition on the PC without having to export it to the console, helping save valuable time.

Hiroshi Waki, head of the Software Technology Division, made his feelings clear. “In the future too, we want to make full use of Autodesk’s products, namely Softimage, 3ds Max and MotionBuilder, using them in right place and at the right time. We hope that this will bring success to our projects and pleasure to all the people who buy our games.”



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