Capcom Co., Ltd.
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Osaka, Japan

Autodesk® Softimage® software
Autodesk® MotionBuilder® software
Autodesk® Maya® software

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—Yukio Seike
   Motion Team Leader
   Capcom Co., Ltd

Into Africa

Capcom spins a tale of dread in *Resident Evil 5.*

Image courtesy of Capcom Co., Ltd.

Summary

The *Resident Evil* series pioneered the game genre known as "survival horror". The eagerly-anticipated new installment, Resident Evil 5 (*RE5*) was released in March 2009 for the PLAYSTATION® 3 and Xbox 360® video game and entertainment systems, with an initial shipment resulting in worldwide sales of over 4 million games according to Capcom. A PC version of *RE5* followed in September 2009.

In this latest installment the hero, Chris Redfield, travels to the Kijuju Autonomous Zone in Africa to investigate some sinister activity. What kind of fate awaits him and his counter bio-terrorist team in this land of searing heat and scorching sun? Let's just put it this way: thanks to the wizardry of Capcom's designers and developers, gamers are in for quite a ride.

The Challenge: Create heart-stopping visuals for co-op gameplay

The *RE5* production team at Capcom had two key objectives. The first was to generate horror through scenes of both darkness and light. The second was to promote a shared gamer experience through co-op gameplay.

Autodesk spoke with the Capcom development team members about the *RE5* project and how Autodesk products helped. The *Resident Evil* series always used leading-edge graphics, but even so, the graphics in *RE5* had to be truly horrific. How did they create these extreme graphics? How did they build the desolate world in which the co-op gameplay unfolds?

The Solution

Capcom used Autodesk® Softimage® software as the main tool in the character production pipeline. They often sculpted models with a 3D sculpting tool, then returned this data to Softimage and used the Ultimapper feature to generate a normal map. But sometimes they created high resolution models directly in Softimage by changing the subdivision level with a simple click of + or − on the numeric keypad. They then used the application's highly intuitive modeling toolset to help add fine details such as the skin of creatures and wrinkles in clothes. Makoto Fukui, the modeling team leader said, "Being able to complete everything from the creation of high resolution models to the generation of normal maps inside Softimage, without having to manipulate data or change applications, greatly reduced work times."

The characters in *RE5* are quite sophisticated, with 130 bones in their bodies and numerous secondary joints. Capcom animators simplified the rigging process by using the Softimage Generalized Attribute Transfer Operator (GATOR) to transfer master envelopes and attributes to their newly-created characters. They also wrote scripts that let GATOR retain and transfer envelope information to multiple selected objects, including those with vertex units. This helped to both expand the range of the workflow and greatly increase work efficiency.

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For background effects, the designers and director flew to Kenya and shot landscapes, which they converted to texture materials upon their return to the Capcom studio in Japan with the help of Autodesk® Maya® software. Then the 3D designers got busy in Maya populating the scene design units with buildings and vehicles, establishing the width of roads and the points at which enemies would appear. Even at this level design stage, the model data to which texture was assigned was of high quality, which each staff member worked to further increase.

The vivid background data in Maya scene files eventually topped 300,000 polygons. In the swamp stage, this data reached as much as 5 million polygons to properly depict plant objects, making for some pretty hefty scene files. To lighten the load and improve work efficiency, team members used the Maya reference feature to take items such as trees and telephone poles, and reference them to the server, not the scene file itself.

Above all, the Resident Evil team members had to make sure the images output to the final product would be attractive to gamers. To create these realistic graphics, they selected a workflow where light maps were generated in a lit condition according to the direction and sense of the designers. "The most important reason in selecting Maya for our pipeline is its excellent real-time viewing of light effects during lighting work in light map generation," explained background team leader, Yoshizumi Hori. "Also, I think that the ease of interaction when managing a large number of materials and handling huge amounts of polygon data is another advantage of Maya."

Yoshizumi was particularly pleased with the elaborate background detail they were able to achieve using Maya. He said he would be delighted if gamers notice this high level of workmanship as they play the game again and again.

To better visualize the flow of action in the gameplay, the team created a live-action video storyboard that combined live-actor performances in front of a green screen, with computer graphic backgrounds. The storyboard let them identify issues in the acting, scene construction and other areas before the actual motion capture data was shot. After all issues were addressed, and body capture at the motion capture studio was underway, they could preview the action in real time using Autodesk® MotionBuilder® software. The high-speed, real-time preview environment of MotionBuilder was key to making the work more efficient.

The motions captured from a real human being are often too slow to use in a game, even when performed by a professional actor. As such, they had to process

Image courtesy of Capcom Co., Ltd.

the captured data in Softimage to at least 1.5 times the original speed. Yukio Seike from the motion team said, "Simply adding animation speed invariably leads to movements that look too light. So we always had to take care to create motions that did not lose their sense of heaviness, even when going fast. Softimage offers the various toolsets required for our demanding animation editing workflow." By converting the animation information to a mixer clip and adjusting the F-Curve of the Warp function, they could freely adjust the pacing and achieve the speed of motion they needed.

The Results

Yoshiaki Hirabayashi, cut scene movie production leader, had nothing but praise for the Capcom development effort. "The team produced highly accurate model data at short notice, and provided the rigs, specification explanations and guidance for the motion capture acting. Further, the incorporation of pre-visualization into game development contributed significantly to the creation of images of the best possible quality in a limited period of time," said Yoshiaki.

The Capcom team has taken image expression to a new level, ratcheting up the mood of horror and terror in this latest installment of the *Resident Evil* series. It is a feat that will not easily be outdone.

Yoshiaki Hirabayashi, cut scene movie production leader
Yukio Seike, motion team leader
Makoto Fukui, character modeling team leader
Yasunori Matsushita, character design and modeling
Yoshizumi Hori, background team leader

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