Move

SOFTIMAGE® | BEHAVIOR™

With SOFTIMAGE|BEHAVIOR, a single technical artist or developer can choreograph tens of thousands of intelligent characters with precision. SOFTIMAGE|BEHAVIOR sets the standard with the industry's first scalable, fully programmable crowd simulation and behavioral animation system. Developing a crowd with SOFTIMAGE|BEHAVIOR is fast and the end result offers never before seen realism of movement.

After looking at every available technology on the market, we chose SOFTIMAGE|BEHAVIOR because of its flexibility, open architecture and Softimage's overall commitment to Linux. Working with BEHAVIOR, we're finding that it provides us with the capabilities required for simulating large crowds and that it has the flexibility to easily create custom behaviors.

Doug Cooper, a Lead CG Supervisor on **DreamWorks' *Sharkslayer***

FROM THE FEW TO THE MANY.

A character created in SOFTIMAGE|XSI can quickly be turned into a crowd of individuals each of whom distinguish themselves through their actions. Once all the members of the crowd are negotiating their environment using their own "brains", send them back to SOFTIMAGE|XSI for final rendering.

SOFTIMAGE|BEHAVIOR is the ultimate crowd management solution.

Productivity without creative compromise:
SOFTIMAGE|BEHAVIOR

Napoleon ©CMT Productions Image courtesy of Hybride

Avid®

It's the thought that counts.

Intelligent digital actors: SOFTIMAGE|BEHAVIOR

"For the DOLLAR BANK spot, my biggest challenge was to have characters that looked really human. SOFTIMAGE|BEHAVIOR was completely amazing in that respect. In the future, I think we'll look back on this application as the very first step in the development of truly workable artificial intelligence. It's very exciting."

Louis Morin, Director, Buzz Image Group

Image courtesy of RIOT

The One by R!OT

"When the director saw our test draft of all these cubes moving in apparently random fashion towards the pyramid, he was stunned.

He said it was exactly the type of motion that he wanted, and that he actually wanted to expand scope of the scene to take advantage of what we had done. What started out as creating and inserting around 300 CG characters into the crowd of real actors became the creation of a crowd of some 1500 high-resolution digital characters. SOFTIMAGE|BEHAVIOR and XSI handled this without a problem."

Jason Balow, Senior Animator R!OT

softimage.com/Behavior/Riot

Image courtesy of Buzz Image Group

Dollar Bank by Buzz Image

Beginning with just two male and two female characters, animator Philippe Sylvain, created a total of eight walk and wait cycles of varying stride lengths for each of the four characters. Once inside the application, the characters were multiplied into a larger crowd. Technical Director Patrick Boucher then used SOFTIMAGE|BEHAVIOR and XSI to get the crowds going.

softimage.com/Behavior/Buzz

CHOREOGRAPH. Thousands of extras.

SOFTIMAGE|BEHAVIOR allows a single technical artist or developer to make tens of thousands of intelligent characters that can be choreographed and coordinated with precise high-level control.

:: Turn around a complete crowd of characters created in SOFTIMAGE|XSI in a fraction of the time traditional methods require.

SMART. Motion blending and collision avoidance.

With SOFTIMAGE|BEHAVIOR each character's "brain" can create new motions on the fly by combining and mixing motion. As a result, characters automatically follow paths, avoid obstacles and react to changes in the scene.

:: Make characters walk, run or swim without having to teach them the basics by simply applying some fundamental motion.

INTELLIGENT. Decision making.

Once the characters know their moves, they can start making complex decisions. While all the characters can share the same basic "brain" each can respond differently and randomly to events in the simulation.

FULL-FEATURED. Development Environment.

Control the virtual extras through the Integrated Development Environment (IDE). With a few lines of script and a graphical representation of the character's decision tree anything is possible.

:: The API provides high-level helper functions that encompass the most common aspects of crowd simulation.
:: Introduce unique crowd behavior with the low-level class library.
:: Troubleshoot efficiently with the debugger included in the IDE.

INTEGRATED. Previewing.

Driven by the SOFTIMAGE|XSI Viewer, the preview capabilities in SOFTIMAGE|BEHAVIOR make the review and approval process fast and painless.

:: Preview simple motion tests or the full simulation right in the development environment without rendering the simulation.

PIPELINE. Complete integration with SOFTIMAGE|XSI.

Characters created and animated in SOFTIMAGE|XSI are used directly by the simulation engine in SOFTIMAGE|BEHAVIOR.

:: Once the simulation is complete, bring data from SOFTIMAGE|BEHAVIOR back into SOFTIMAGE|XSI for final rendering.

PRODUCTION PROVEN.

SOFTIMAGE|BEHAVIOR has already been used in several major productions. No other crowd simulation package can make the same claim.

SUPPORT. A partnership.

Softimage is renowned for the attention we give to our customers. Not only are we there when you need help to solve any production problem, we also provide innovative tools that help you to produce higher quality work faster.

SO, HOW'S IT DONE?

A brief anatomy of a crowd scene.

NAPOLEON'S DEFEAT AT WATERLOO. In this pivotal shot, 1500 digital characters must turn and run in retreat. Tragically, some of these characters will also die. This throng of soldiers fleeing the battlefield for their lives is made possible by combining digital characters, live actors, and composited live actors.

The task of producing this simulation fell squarely into the lap of **Marc Bourbonnais, Technical Director for Hybride.** To be able to pull this off, he needed a sequence of complex actions in which soldiers not only retreat en masse, but they also needed to move in waves, fleeing chaotically for their lives.

Design characters as realistically as the shot demands

Starting from reference images taken from live actors, Bourbonnais created and textured the digital characters in SOFTIMAGE|XSI.

Assign animation cycles to the character

Bourbonnais created low-resolution characters, which were appropriate for both final rendering and for BEHAVIOR to generate the simulation quickly. Each character shared the same bank of animation clips: variations on walking, running, and falling over. BEHAVIOR doesn't care whether the cycles are created in place or not, which makes it easy to use motion capture data.

The set was laid-out on a simple grid: the soldiers marched across a fairly flat plane. However, BEHAVIOR's intelligent digital actors are smart enough to follow any type of terrain with a natural ease.

Import the characters and the set

Bourbonnais then imported both the actors and the set into BEHAVIOR. The XSI Viewer, which is integrated into the BEHAVIOR development environment, made the real-time previewing and tweaking of the simulation easy and efficient.

Piccolo scripting lets you get your crowd up and running quickly

To help you quickly create crowd scenes, you can choose from a set of pre-defined high-level helper functions to assign and manage the character's behavioral animation. For more control and flexibility, the BEHAVIOR API also allows you to build your own behaviors and gain finer control over the how the characters behave in the simulation. The flexibility of the BEHAVIOR API proved useful to Bourbonnais, who wrote a script using BEHAVIOR's scripting language, Piccolo.

In Bourbonnais' short script, the BEHAVIOR engine is told where to find the characters and attach to each of them a state machine (their "brain"). The state machine, which controls how the intelligent digital actors deal with events in the simulation tells the soldiers in which direction to start running, as well as randomly selecting who's going to die.

The result

In record time, Bourbonnais was able to deliver a shot of over 1500 soldiers fleeing the battlefield, each soldier possessing its own unique response to one of history's most famous battles.

Read more case studies at softimage.com/behavior

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