A Mind of Their Own
Artist intelligence software enables animators to create detailed crowds filled with characters that can react autonomously to one another.

By Richard Verrier, Times Staff Writer
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Lucas is terrified. The boy has water-bombed an ant colony. Now, he's being hauled before the Ant Queen.

Pointing and nodding, some 2,000 angry ants watch closely, flexing their mandibles and switching their antennae. Still others are shaking their heads and chatting among themselves until a loud gong brings them to silence.

Creating such a detailed crowd scene in "The Ant Bully," a computer-animated film that opens today, once would have been too painstaking and costly. But thanks to artificial intelligence software, a single "brain" was created, allowing the ants to react autonomously to one another and their surroundings.

"The ants came out looking so real it was almost creepy," said Mark Thielen, crowd animation supervisor for the film at DNA Productions Inc. in Irving, Texas, one of the producers.

Sparked by the popularity of computer-animated movies, Hollywood is looking for new ways to stretch the art form's boundaries. So producers are using something that Walt Disney himself could have scarcely imagined: technology with the ability to create lifelike animated characters whose actions are guided by computers emulating human reasoning through artificial intelligence.

Known as Massive, the software is the brainchild of New Zealand computer graphics guru Stephen Regelous, who helped create the spectacular battle scenes featured in director Peter Jackson's "Lord of the Rings" trilogy.

Massive has since been used in such films as "King Kong" and commercials such as Budweiser's "The Wave" that aired during the Super Bowl and World Cup telecasts. In that ad, 97,000 virtual fans raise cards to create a collective image of a bottle of beer pouring into a glass.

"It's bringing characters to life," said Regelous, 42. "It's allowing artists to create something more than they've ever done before."

Major visual effects houses are now using Massive and other artificial intelligence software in increasingly elaborate animated movies, crafting scenes once deemed too costly to put on film.

"Artificial intelligence software is going to continue to allow us to tell more interesting and complex stories," said Chris DeFaria, executive vice president in charge of animation at Warner Bros.

The studio's "The Ant Bully" is the first U.S. animated film to use Massive, but others are coming soon. Industry leader Walt Disney Co.'s Pixar Animation Studios is employing the software for its upcoming films.

So are the producers of the Warner Bros. film "Happy Feet," a Robin Williams comedy about penguins that opens in November, and the upcoming Miramax Film Corp. release "Renaissance," a black-and-white animated film that used Massive to create a...
neighborhood set in a futuristic Paris.

Although many view the software as a breakthrough, the new technology has spurred debate in Internet chat rooms that cater to the tightly knit animation community. As with the advent of computer graphics and motion capture techniques, some artists fear that filmmakers will overuse the software at the expense of human creativity.

"There's always concern by the animators when a new piece of software comes out that it reduces their artistry by making it all mechanical," said visual effects producer Joan Collins Carey, who chairs the Los Angeles chapter of Siggraph, an organization that hosts an annual gathering of computer graphics experts. "Once they understand they are not threatened, then they embrace it."

A former freelance graphic designer, Regelous largely taught himself how to write software by studying books from a local library after attending one year of college. He and a friend launched their own computer graphics business and soon began making TV commercials.

Their work caught the attention of Jackson, who hired Regelous to work as technical director on the 1996 horror movie "The Frighteners."

Impressed with his ability to solve complex animation problems, Jackson approached Regelous about "The Lord of the Rings," which would require creating battles involving hundreds of thousands of warriors.

Jackson proposed an arrangement in which Regelous would write the software for Weta Digital Ltd., a New Zealand visual effects house the director co-founded. But Regelous would retain ownership of the code.

Huddled over a laptop computer at his home in Wellington, New Zealand, Regelous spent the next two years building the software to create the creatures that clashed in Jackson's battle scenes. His aim: to build characters that could interact with one another and their surroundings.

The process involved creating three-dimensional "agents" on a computer. Human actors were used to capture various motions for each agent. Regelous then crafted "brains" for the agents composed of thousands of interconnected nodes that enabled the agents to respond to sights, sounds and motions. Then he forged copies of a variety of agents to give each warrior or goblin distinct characteristics.

"I felt like I was opening a new frontier in computer animation," Regelous said. "I saw it as a fantastic experiment."

The experiment was a big success, enabling Jackson and his colleagues at Weta to create numerous memorable battle scenes for the three movies. In 2004, the Academy of Motion Picture Arts and Sciences gave Regelous a science and engineering award for his work on Massive, which he licensed for use in various other films for $6,000 to $18,000 for each computer workstation. After leaving Weta Digital in 2002, Regelous founded Massive Software, which is based in New Zealand and has 20 employees. The company has been building its business with various Hollywood studios and virtual effects houses.

Its clients include Los Angeles-based effects house Rhythm & Hues Studios, which made extensive use of Massive for the elaborate battle scenes in Walt Disney's "The Chronicles of Narnia: The Lion, the Witch and the Wardrobe" involving thousands of gryphons, centaurs, fawns and other creatures.

"This was a really important tool for us," said Dan Smiczek, effects supervisor at Rhythm & Hues. "Because of the scale and the different types of characters we wanted to use, there was really no other way we were going to be able to do it."

As for "The Ant Bully," it took just seven animators a year building 40 "brains" to do the thinking for thousands of ants.

"I wanted to make sure we had the firepower to show the sheer number of ants," said writer and director John A. Davis. "We had tons of crowd scenes that you could never have animated by hand. If we did, we'd still be working on the film five years from now."

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Behind the scenes

Program name: Massive

What it is: A pioneering 3-D computer animation system that incorporates artificial intelligence, which emulates human reasoning. The system uses "agents" that have their own "brains" that enable them to react autonomously to the world around them.

Key feature: Enables animators to control and copy the agents — which can be such creatures as birds, humans and ants — to create scenes involving thousands of characters with distinctive traits and movements.


Source: Times research

Los Angeles Times

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