John Gaeta and "The Matrix"

by Debra Kaufman for VFXPro
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John Gaeta was the visual effects supervisor on the Warner Bros. film, "The Matrix," directed by Andy and Larry Wachowski ("Bound"). Gaeta, who is one of the two visual effects directors at Manex Entertainment (MVFX), is a graduate of the NYU Film School, and got his start in the industry working as a production assistant on "Saturday Night Live" in the film unit that created commercial parodies. His first jobs in visual effects were learning stop-motion animation for commercials at Peter Wallach Productions. That's where he got his first glimpse of feature film effects when he was chief lighting technician for Wallach's miniature work on "Star Trek V." At Doug Trumbull's Berkshire Motion Picture in Massachusetts, Gaeta was camera operator on the "Back to the Future" theme park ride and assistant visual effects supervisor on the "Luxor" project.

Joining Mass.Illusion (now Manex), Gaeta worked as the facility's associate visual effects supervisor on "Judge Dredd," one of the two visual effects supervisors on "Eraser" and Manex's visual effects supervisor on "Starship Troopers." "The Matrix" is his first solo outing as a visual effects supervisor.

When did Manex get involved with "The Matrix?"
The job was awarded in November 1997 just as Mass Illusions (M.I) was at its twilight. M.I then expired and morphed into Manex VFX which moved the core talent and technology west to San Francisco. Our CGI department, which eventually ramped up to 65 digital artists, began on the first day the job was awarded. By the end, three visual effects houses worked on it: Manex and two Australian houses, Animal Logic, which has about 15 digital artists; and DFilm, which has 20 artists.

How many digital shots are there in "The Matrix?"
There are 415 shots.

How did the work get divided? How did you ensure consistency among the three houses?
Manex took on most of complex shots -- all the big digital creature shots, all of what we call the "Flow-Mo" shots, full CG and many digital "transition" shots. Neither Animal Logic nor DFilm are large companies. But DFilm, headed by Digital Supervisor John Thum, was strong in compositing, so I gave them the compositing of a number of scenes including the helicopter crash sequence, originally visualized by my Sydney-based team. DFilm's big CG scene was the melting mirror scene. Animal Logic, headed by Digital Supervisor Lynn Cartwright, did many shots involving 3D graphic depictions of programming code and a nice little exploding man shot.

With regard to consistency, my 3D and 2D technical supervisors and I were on the phone all the time, establishing standards for color and scanning. In specific, Janek Sirrs, my associate supervisor was the job's leading authority on color management. On the creative side, I was continually trying to link color pallette, nuance and detail that would make any one scene feel connected to all the others. All the houses were in regular touch through FTP site deposits and quick times. Often, we shared information and even elements under the table because it collectively aided the project.

How important was previsualization?
It was very significant. This is what allowed us to conceptualize a way of doing the virtual cinematography work. My staff's experience in doing visualization is what gave us the confidence to create what the Wachowski brothers called "bullet time," their term for climactic moments that take place in the virtual world in which the action moves at the speed of bullets. At Manex, we call virtually moving around foreground subjects "Flow-Mo," which when combined with the 3D virtual backgrounds becomes virtual cinematography. It should not be confused with "deadtime or "timeslice" because these techniques are restricted to static moments of time, limited frame counts, simple arc camera moves and no clean ramps into or out of those moves.

In addition to all these "Flow-Mo" scenes, what were the other digital challenges in "The Matrix"?
The other thing that the Wachowski brothers wanted to be able to create is a world of machines and creatures that were extremely high in detail and extremely abstract in nature. They came out of the alternative comic crowd, and their main conceptual artist, Geoffrey Darrow did amazing front-endwork. The Wachowskis had not seen evidence that this level of detail plus absolutely fluid motion could be done in CG or even animatronics. That was in 1996, when there was no material in CGI that had been done in this category. They looked at various films such as "Aliens", but nothing was at their expectations. So they waited for almost two years from first conceptual to finding people who could reach what they wanted to do. The whole time we were getting to know them, we were taking their conceptuals and assembling creatures, before we even got the job. This made a big difference.

What was the most challenging sequence in the film?
There is a 35-second shot known as the "Fetus Fields" scene. It was technically headed by Rudy Poat. That shot's been in production for 1-1/2 years. And in that shot, there are five or six different unique creatures, all highly detailed and moving in quite eerie ways. The basic design intent was to create very realistic organic tissue, similar to sea creatures and

underwater life, all things that are light absorbent as opposed to light reflective so it looks like there's density to their membrane make up. It was a massive scene.

What about the helicopter crash sequence?
The interesting thing about that was that it was the largest miniature shoot that the Australians had ever accomplished. The head of special effects was Steve Courtley. He and his team are the "Mad Max" guys -- they had a great attitude. One of my five Sydney based visualization TDs, Rob Nunn, worked closely with Courtley's people to define everything from the trajectory to the pyrotechniques triggering to the reflected greenscreen coverage. It was very carefully paced, to allow just enough time for each physical effect to occur so that we could integrate the CG elements, such as the rippling of the building. The surrounding glass wall was a 1/4th scale miniature inserted into an arial plate.

What about digital character animation?
The real world is maintained by a wide range of neurally networked beasts. The docbot, which is a massive biomechanical creature in the power plant, is also a very cool character in that its limbs are made with universal joint engineering. If you look at that shot, you'll see he does unusual rotations with his limbs. The details are so unbelievable! There are so many moving parts, organic flesh areas -- it's an amazing piece of animation. One person rigged it, two modeled it, two people shaded it, two people painted it and two people animated it. Grant Neesner, a 3D conceptual artist and modeler, did a number of these scenes from the ground up with great detail and form. The sentinel creature is analogues to a giant squid but it is capable of fascinating patterns of tenticle movement connecting it back to a logical thinking creation. It is not restricted to squid or octopi motions. In various shots, the creature "orangutangs" itself into impossible places. In the "Fetus Fields" scene you will be able to spot five free-roaming hideous workers of the evil machine empire.

Did you break new ground with "The Matrix"?
"Flow-Mo" was groundbreaking. But more than that, here is an example of full-resolution computer graphics images being used for daring ideas, as opposed to safe story ideas. We have been waiting a long time for studios and producers to understand that you can use CG to travel through any subject matter -- it's not restricted to eye candy or soft issues. It's time to break away from the idea that nothing is more provocative than that which the ratings board believes a 13 year old could bare. Some of us are enjoy seeing movies which are intelligent.
