Sounds like motion

Derivative adds a new Touch to electronic performances, merging visuals with sound to produce a new paradigm in digital music

by Bob Kim

(left to right) Dave Robert and Greg Hermanovic of Derivative set up gear for Plastikman's live performance at the Mutek festival in Montreal; Richie Hawtin (aka Plastikman) surrounded by controllers and equipment; Hawtin tests the system before his performance; Hawtin and Derivative's Jarrett Smith work out last minute glitches; Plastikman works the controls in performance
The evolution in sound and sight also implies something else, which became evident to the Plastikman faithful—one person is running the whole show. In a conventional performance, the audio component comes from one source (the artist), and the visuals come from another (the visual effects dude). The visuals follow cues in the music and are shaped accordingly. The level to which the two are integrated depends on a number of factors: the skill of the visual effects dude, the budget, and how much the artist actually cares about it.

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nect, as there are always at least two people involved in the performance. Those artists who can afford the high end rigs often don’t get involved directly in the visual aspect. Like choreography or set design, this is something they rely on someone else to execute.

What’s interesting about Derivative’s Touch system is that the artist is forced to think very carefully about the visual aspect of a show, as the two are, by definition, organically linked. If changing a setting in audio (for instance, gain level) changes a setting in video (such as object rotation speed), what happens if the audience begins to respond to something they see instead of hear? Focusing the visuals on the desired effect brings this dynamic full circle; and working toward a desired visual effect drives the music.

Talking about the first time the complete CTRL LIVE rig was fired up for testing, Hermanovic describes what happened when Richie Hawtin started moving audio faders to see the visuals attached to them.

“That’s when it started to get mad. Richie’s face lit up, as did everyone else’s. Next thing we knew, he was bringing in sound elements from unrelated songs, perfectly in sync, just to see what their visuals looked like together. Then Rich realized that the visual compositions were guiding his musical compositions.”

**When Richie Met Greg**

Hermanovic’s relationship with Hawtin began in 1999, when Geoff Marshall of animation house Chromacide made live graphics for Hawtin using Hermanovic’s special effects software, Houdini. However, in order to get the power and accuracy they needed, anything that was worth showing required the use of high end workstations (which, incidentally, are also extremely heavy).

Hermanovic recognized that if the technology was to be feasible for the mass market, and if it was to be adopted and used by artists, then software and hardware first had to catch up.

As he describes, “We knew that if we waited a few years for software to mature and costs to come down, we could make another leap ahead—without training to be weight-lifters.”

In 2004, Hawtin contacted Hermanovic with the intention of pulling something off. Something big.

He wanted to explore the relationship between audio and visual effects in a way that had never been done before. All the audio, video and lighting would be controlled by one person, from one piece of gear—through what was to become the CTRL LIVE controller.

Hawtin showed the Derivative crew a copy of Norman McLaren’s experimental film, Synchromy, and asked if they could make something like that. McLaren was a pioneer in the field of animation, incorporating light, color, motion and sound into an eclectic soup of contrast and evolution. In the 1930’s, McLaren pioneered the use of making movies without cameras—by painting directly onto the film itself (contemporary animation, anyone?). In the early 40s, he made what were perhaps the first forays into audio-video experimentation when, in a moment of foreshadowing, he began drawing directly on the audio track of the film and created “animated sound”—that is, sound which is driven by visual input.

Hermanovic had to chuckle when he recalled being asked to reproduce Synchromy in real-time animation. One day back in 1980, when he was laid up with a broken arm, he gave himself the challenge of writing a program that would digitally reproduce Synchromy. Writing on newsprint with his very shaky left hand, this outline became the basis for Touch. They made a prototype visual, loosely based on Synchromy, and then moved forward to create visuals for the remaining 26 songs in Hawtin’s anticipated Mutek set.

Making the visuals was one thing. Getting Touch to talk to Live (Hawtin’s audio sequencer of choice) was something else.

Working with Ableton, developers of Live, Derivative adapted the Touch system to accept MIDI clock and loop start/stop/repeat events, which were being output by a custom build of Live 3, designed specifically for this project (the features they developed will not be available until after Live 5).
Derivative is the twisted child of Greg Hermanovic, best known for his ground-breaking 3D effects company Side Effects and its flagship software product, Houdini.

Since its inception, Side Effects has been an innovator in the field of 3D special effects—first to put a GUI onto a procedural modeling system (1987), first to use particle systems (1992), and first to include motion capture and time-frame sampling (1995). Houdini has been used in over 150 feature films, including The Matrix, Titanic, How the Grinch Stole Christmas, Fantasia 2000, X-Men, and Spiderman.

Houdini is powerful stuff, but it is designed to produce highly detailed film and video animation and effects. However, Hermanovic had always had a vision of developing software for real-time animation. “Derivative spun off from Side Effects in 2000,” he says, “fuelled by artists’ growing appetite for interactive visual tools (which paralleled what kids were seeing with music software), and also by new laptops with fast CPUs and graphics chips that could render rich layers of textures in real-time.”

Touch was cloned from Houdini, but taken in a different direction. Instead of being special effects software targeted to production houses and the Hollywood elite, Touch was to be a tool for the masses.

Moore’s Law (which dictates that computer processing power will double every 18 months) has been remarkably accurate—and in 2000, the timing and costs were right.

Touch is based on procedural modeling, much like the modular sound synths of the 70s, but this time applied to graphics. How the modules are connected and the feedback and response of different modules to 3D models will create new kinds of visual effects.

The movies, stills and 3D algorithms which make up a Touch Synth are designed to evolve and interact according to 3D modeling rules. Each aspect of the behaviour of the object can be assigned to a fader in the control panel, allowing the DJ to blend pre-keyframed motions, camera moves, lighting, and other actions. The TouchMixer then allows all the synths to be customized live on the fly, according to mood or audience response. When working with an audio artist, the results can be astoundingly beautiful.

A burgeoning interest in Touch by the architectural community has triggered another area of development for Derivative. Touch is now being used to bring a sensitivity and elegance to the design of structures through the addition of digital media.

One of the most exciting installations of the Touch system is in the Prada building in downtown Tokyo. Derivative was called upon by the renowned architectural firm Herzog & de Meuron to develop different animation concepts to be projected onto five surfaces throughout the building. Being all glass and open concept in design, the images saturate and smooth the architecture. During the evening, the Touch system illuminates the entire edifice and its immediate surrounding area, so that the structure itself comes to life—pulsing and glowing in the Tokyo night.

The images themselves are designed to resemble the surfaces on which they are being projected. For example, at the top of the building, a latticework of holes punched out of metal surrounds Derivative’s projections. The images on the screen are designed to resemble the lattice—that is, until the lattice seems to throb and give way to shapes and wave forms which try to break free from underneath.

The danger of an installation such as this is to avoid repetition. If it were to simply loop pre-rendered images, the constant repetition—no matter how complex the visuals—could easily bore customers and employees. But here is the genius: Touch has a certain amount of serendipity built into it. No matter how often the exact sequence of faders and knobs is executed, the result is always a little bit different from the time before. So, in the Prada building, the experience is always unique and captivating, adjusting daily according to sunset and sunrise times; and during the 48 hours around the full moon, it shifts its colors to an icy blue palette—acting in essence like a full moon indicator.