

Between analysis and synthesis: SpectralGL, audio visualization, and the new paradigm for real-time interactive instruments

Jesse Gilbert (jesse.gilbert@woodbury.edu), Media Technology Chair, Woodbury University

Abstract:

Much as advances in CPU power enabled an explosion of creative virtual audio instruments over the previous decades, recent improvements in GPU technology have enabled a new class of visual instruments that incorporate sophisticated real-time 3D rendering techniques previously unimaginable. Such instruments benefit from decades of development in human-computer interaction, along with readily available low-cost input hardware (i.e. Microsoft's Kinect, Apple's iPad, MIDI devices) that greatly expand creative possibilities in performance. In addition, real-time signal analysis techniques offer striking insights into natural or technological phenomena that can be incorporated via visualization to create truly multi-disciplinary instruments.

It appears, therefore, that we are at the dawn of a new era of visual tools that can both create new aesthetic experiences and communicate with us at an intuitive level about our world. In the context of improvisation such visual instruments are challenged to articulate a language that is relevant to both a technical and artistic discourse. Building on a two decades of collaborative media projects, Jesse Gilbert presents SpectralGL, and discusses its development through the lens of an ongoing dialogue between the arts and sciences.

Description of Gilbert's original software, SpectralGL: <http://jessegilbert.net/code/spectralgl/>

SpectralGL is a visual instrument that employs an interactive software system to generate real-time 3D animation in response to live or recorded sound. Employing a number of computational analytical tools, including Fourier analysis and oscilloscope-style waveform deformation, SpectralGL reveals the deep structure of sound in a visual language that is both intuitively and aesthetically linked to our emotional experience of music. SpectralGL's interface gives the performer the means to generate highly dynamic 3D scenes that place the observer in a visual relationship that both enhances and reflects on the process of listening. In addition, SpectralGL's ability to overlay digital media onto its 3D surface expands upon traditional notions of presentation of the moving image, and of the relationship between sound and image.

Bio:

Jesse Gilbert works in sound and software design, creating flexible tools that are activated in live performance, via network interaction, or in installation settings. His work has recently focused on developing [SpectralGL](#), an interactive 3D visual instrument, on building multi-channel immersive sonic environments, and on composing electro-acoustic music for the moving image.

Gilbert started Dark Matter Media LLC in 2007, through which he consults on a variety of projects in the art and entertainment industries. He is currently the Chair of the Media Technology department at [Woodbury University](#), and has taught interactive software design at both [CalArts](#) and [UC San Diego](#). Gilbert's collaborative and solo work has been shown widely in the US and abroad; venues include [Ars Electronica](#) (Austria), [Museum of Contemporary Art](#) (Los Angeles), [Färgfabriken](#) (Stockholm), [Laboral Centro de Arte](#) (Gijón), [RedCat](#) (Los Angeles), [Millennium Park](#) (Chicago), [Mostra SESC de Artes](#) (São Paulo), [Cemal Resit Rey Concert Hall](#) (Istanbul), [Festival International de Musique Actuelle](#) (Quebec), [Roulette](#) (New York), [Sons d'Hiver](#) (Paris), [Saalfelden International Jazz Festival](#) (Austria), [Café OTO](#) (London), [Voll-Damm Festival Internacional de Jazz](#) (Barcelona), [Guelph Jazz Festival](#) (Ontario), [Engine27](#) (New York), [New Museum](#) (New York), [Gulbenkian Foundation](#) (Lisbon), [Automata](#) (Los Angeles), [net.congestion](#) (Amsterdam), [Whitney Museum](#) (New York), [Grand Performances](#) (Los Angeles), [HERE Arts Space](#) (New York), CEAIT Festival (Los Angeles), [Kunstradio's Recycling the Future](#) (Austria), and [PORT](#)(MIT, Boston). His work has received support from the [National Endowment for the Arts](#), [Eyebeam Atelier](#), the [National Performance Network](#), [turbulence.org](#), the [Studio for Creative Inquiry](#) (Carnegie Mellon), the [Jerome Foundation](#), [Creative Capital](#), the [Markle Foundation](#), the [Beall Center for Art & Technology](#)(UC Irvine), the [Banff Centre for the Arts](#), the [Montalvo Arts Center](#), and the Center for Experiments in Art, Information and Technology (CEAIT).