THE PERCEPTION OF COLOUR

Interview with Matthew Biederman
Arie Altena

Matthew Biederman's installation *Event Horizon* (2012) is a multichannel generative HD audio/video installation that metaphorically explores the phenomenon of an 'event horizon', a boundary in spacetime, such as around a black hole, from where light cannot escape and thus cannot be observed. To produce visual material the software of *Event Horizon* iterates through a basic generative system that uses pure fields of red, blue, and green, modulated, layered and interspersed with black. For the sonic component, the same code is translated to drive a set of software-based synthesisers to generate a series of overlapping drones.

Arie Altena In *Event Horizon* there is clearly a fascination for colours. Maybe we should start by talking about colours as physical waves, because in most of your works there is a connection to the idea of the electromagnetic spectrum?

Matthew Biederman I have a fascination for perception, for the idea that our eyes and brain and body decode electromagnetic waves as images. You can think about it in the same way as a radio that detunes and retunes the radio waves into physical waves that we can hear, or as a television, which does the same, converting radio frequencies to light frequencies. Also an X-ray photograph retunes chunks of the electromagnetic spectrum into wavelengths we can see. *Event Horizon* takes ideas from astronomy, physics and cosmology and sort of compares them to neurological theories concerning perception. I'm very interested in the ways we perceive the world. In astronomy and physics the event horizon is the edge of a black hole. But I think each person is also one's own event horizon, meaning that simply by being present, each of us perceives the world individually and therefore differently. I conceived the installation, including the sounds, visuals and the arrangement of the space, in such a way that no matter where you stand in the space, you have a very different understanding of that space. There might be ten people in the space, but each of them will perceive the space in a different way. This is also what fascinates me about colours. There is a famous

quote by the artist Josef Albers, which runs something like: 'I could stand in front of a room of people and say: everybody imagine the colour red. I could be fairly certain that everybody is imagining red, but I can also be very certain it's a different red'. Even the act of naming a colour presents an interesting problem. When does red become orange? When does blue become green? We have been trying to classify colours for a long time. Only now, in the digital universe can you finally quantify a colour. You can put a number to it, or a set of numbers, on a digital scale, and say: that's 127 red, 8 blue or 12 green, and it will give you a certain hue, saturation and value. Within digital systems, there is now a quantified standard that didn't exist before. In the past all colour researchers – Goethe, Newton, Itten – made their own colour wheels and came up with their own models. Now we can quantify it. But still, there is information that is inherently missed when a picture is digitally sampled.

AA Your installations and projections use a lot of different digital colours and hues that are almost the same. But as far as I understand, every computer screen is different, and every beamer is different. How do you work with that? How important is it to get the fine-tuning exactly right?

MB I try to tune the works as best as I can. Certain pieces require a specific technical solution. For *Event Horizon* I look at the way the gradation goes to black. I also have a piece *R+G+B* that is specifically about the digital sampling issue. It just counts through all 65 million colours for an 8-bit screen. In that one I just watch it to make sure there is a clean step between each of them. It's a fairly simple piece, but I find it interesting to map out all the colours a computer can generate. Even if – and this goes back to the perception problem – a different beamer and a different screen

and computer (and different combinations of those) do render the same piece with slight differences. But who is to say which is the correct one? I look at it, I fine-tune it, but somebody else sees it differently. That's exactly the grey area that I want to explore. There is another piece called *Ouroboros (Or Color Bars Matched Horizontally One by One)*, where the computer creates all 16.7 million colours, from these it makes a set of vertical stripes and matches them. That piece is really about the idea that only another digital system can recreate those colours and represent them exactly. You might see a certain colour as purple, while I see it as blue, and somebody else says, no it's something else. But the piece runs on a digital system that can sample it, can state what it is, and match it exactly.

AA When ten people look at *Event Horizon*, they all see something different. Is that mainly because of how our eyes work, or is it also in the spatial set-up?

MB It's both. It has to do with the architecture of the space, so just by standing in a different spot, you perceive something different. But *Event Horizon* comes also out of the ideas that neuroscientists are proposing now as the next step after the phenomenology of Merleau-Ponty. They say that the brain doesn't live in a jar that is connected to our eyes and ears – which has been the model for a long time. Instead we sense the world with our bodies and by moving around. The philosopher and neuroscientist Alva Noë is a big proponent of the idea that our body is also a sensing organ – and not just our brain. I've been thinking about how to create a situation where this becomes apparent, and *Event Horizon* is an attempt to do this. The audio uses the architecture of the space, even when you just turn your head slightly, the audio sounds very different. I wanted to make a space that pushed people to

move around to look and listen. This is also where the idea of an 'event horizon' comes in. There is the horizon of you moving around: your body as a horizon. The horizontal horizon on the screen becomes a *moiré* pattern, and it looks as if there is something three-dimensional happening. It is a a technological horizon, because the display cannot go beyond a certain point, so it creates a *moiré* pattern. A 3D-effect is created in your brain, out of something the computer can't recreate. The screen in the middle of the space is another physical horizon, and it breaks up the projection. Because it's translucent you can see on it and through it simultaneously. With it I try to evoke the idea that, a horizon is not necessarily a physical thing. It moves and things pass by and through it all the time.

AA What happens exactly in with the generated colours and imagery? You mix colours – can you explain how that functions?
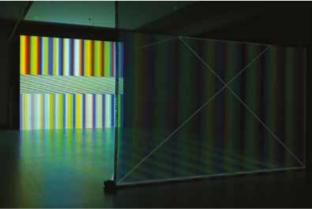
MB It's a technical trick and it's really basic: a mixing of RGB colours interspersed with black. Then I add to or multiply them in different ways, to emphasise the idea of an RGB universe. By adjusting and slightly shifting the angle and the frequency of the stripes, the *moiré* pattern that I mentioned is created in the centre of the screen. In fact the edge pixels stretch so much they resemble stripes. *Event Horizon* is generative, so there is no ending or beginning. People tend to stay in the installation, sometimes to see when it starts looping, but that never quite happens. The piece works according to a certain rhythm, and there are certain states that it goes in and out of, but it is never quite the same, nor is it ever the same arrangement of colours.

AA Because you work with these big fields of colour, one is reminded of colour field painting, Barnett Newman, the idea of sublimity and colour…

MB I have always been a big fan of minimalist colour field painting, of pure saturated colours... I think there is something very provocative and sensual about it. Being awash in colour. There is a meditative aspect to it that I also try to evoke. I consider a work like *Event Horizon* to be more connected to painting and conceptual art than to most other media art. I have intentionally stepped away from the kind of interactivity where 'if I do this, then that happens'. I see that as an easy way out. This work is about having to make a decision about the composition. I tried to push myself into a position where I have control. Of course I worked with algorithms again, so I don't have complete control. But there is more control than in interactive work. The works I'm making use a systematic approach. They're based on rule-based conceptual ideas, which are then applied to time-based media. I look at the work of Sol LeWitt, Barnett Newman, and Josef Albers, and I'm trying to be sensitive to some of the systems and colour issues that they were working with. And I wonder what you could discover if you explore these issues over time.

The Dark Universe

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Matthew Biederman, *Event Horizon*, multichannel video installation, 2012, Kontraste Festival, *Electric Shadows*, Krems, 2012.