cartographs: the trans-sensory metaphor

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ABSTRACT

The visual music composition *cartographs*, a work in three short movements, is presented.[1] Each movement is an abstract animation—a visualization of a numeric process—that is then mapped into a single static image (a score)—that is then mapped into sound. Thus through the process of data mapping we hear and see a process unfold, each sense simultaneously experiencing a map (a metaphor) of what the other sense is experiencing.

Author Keywords

visual art, music, generative art, data map, metaphor, aesthetics

ACM Classification Keywords

J.5 Arts and Humanities: Fine arts, Music, Miscellaneous.

General Terms

Design, Experimentation

ART STATEMENT 1 (MAKING MAPS)

We are order-seeking creatures. Through our senses we receive signals from the world around us. Our senses convert these signals into electro-chemical data we then interpret, thus creating all of our experience. We try to make sense of these signals. What endures? What repeats? What changes? We look for structure. We recognize and compare patterns, trying to understand the sensory data. We build a basis from which we make choices. Living is the making of choices, based upon receiving signals and perceiving pattern within those signals.

Artists are order-making creatures. Sometimes we want to simply understand what order is. What establishes order? What defines pattern? Digital artists have number as their medium. Like homogeneous neural data, all digital representations of signals are in the same format. Digital data are binary numbers. As we create a digital experience it exists as numbers and we can map those numbers freely. If we use numbers to create aural experience we make a sonic map. A visual experience maps numbers into colors, making an image. It follows that we can create a sonic map of the numbers comprising a digital image and so hear the image. Of course the reverse is true. Monet's *Water Lilies*
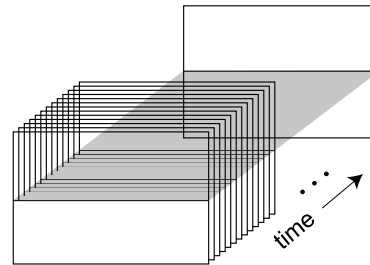
Figure 1. Time slice through a scanline of a series of frames.

can be a symphony, Beethoven's *Ode to Joy* a wash of pigment on canvas. As a visual artist and music composer, crossing this sensory divide is of particular interest.

SONIC MAPS (IMAGE TO SOUND)

In creating a sound score for an animation I start by making a time slice. A time slice is a static image built by extracting a single scan-line from each frame of the animation and stacking these lines sequentially. (Similar in result to the photographic slit-scan process.) Figure 1 shows a representation of an animation as a series of rectangular frames with time represented as depth. The time slice is constructed as a 2D cut through the time axis. Placing these scan lines on a single image, one after the other, gives a picture of the evolution of the animation on that line. The resulting image is a 2D graphic map of the 4D temporal object. See Figure 2 and Figure 3.

The image becomes a music score from which I then compose/perform a soundtrack. [2] Thus the static map (the score) is mapped again, this time into sound, carefully constructed with a duration that matches the animation. Sound is image, image is sound, data is mapped across the senses, a different kind of metaphor is constructed. (Time slices are created using tools creating with the Processing programming language. The sonic maps for *cartographs* were composed/created using U & I Software's Metasynth music synthesis software.)

ART STATEMENT 2 (MAKING METAPHORS)

Maps are metaphors. [3] Through metaphors we connect what we experience to what we remember. We create knowledge by connecting the new (the present) to what we

know (the past) and so maybe predict what happens next (the future).

Our desire to predict fuels our desire to live, to survive. Desire is the foundation of narrative. Narrative reduces to desire, action and result—the structure of story. We exist in endless loops of desire—layer upon layer of stories of varying temporalities and shifting priorities—all synchronized to rhythms of breath and heart.

I make maps, in and out of time. I start with raw digital code—simple numeric models. As all is number in the computer I can map the numbers to the senses—turn numbers into tangible experience? The maps might loop in time (animation and audio) or freeze in a moment (a still image or print). There is synchrony in the sensory vertical and the temporal horizontal. Image and audio derive from the same numeric source. Each maps the other in the moment and through time. It's a visual music in a synaesthetic counterpoint.

Musical narrative developed over centuries, moving the listener through time with the Pythagorean struggle of harmonic conflict—dissonance seeking consonance. My

little loops and images engage that struggle at various levels. Color shifts. Composition flows. Image and sound agree, complement, disagree and resolve.

Perhaps it's abstract expressionism, true to its digital materials, founded in musical traditions and Modernist formalism. But it's loosened a bit. It's jazz in color, shape, sound and computation. Relax. Hear the colors. Listen with your eyes.

REFERENCES
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3. Lakoff, G., Johnson, M. *Metaphors We Live By*. University of Chicago Press (2003).
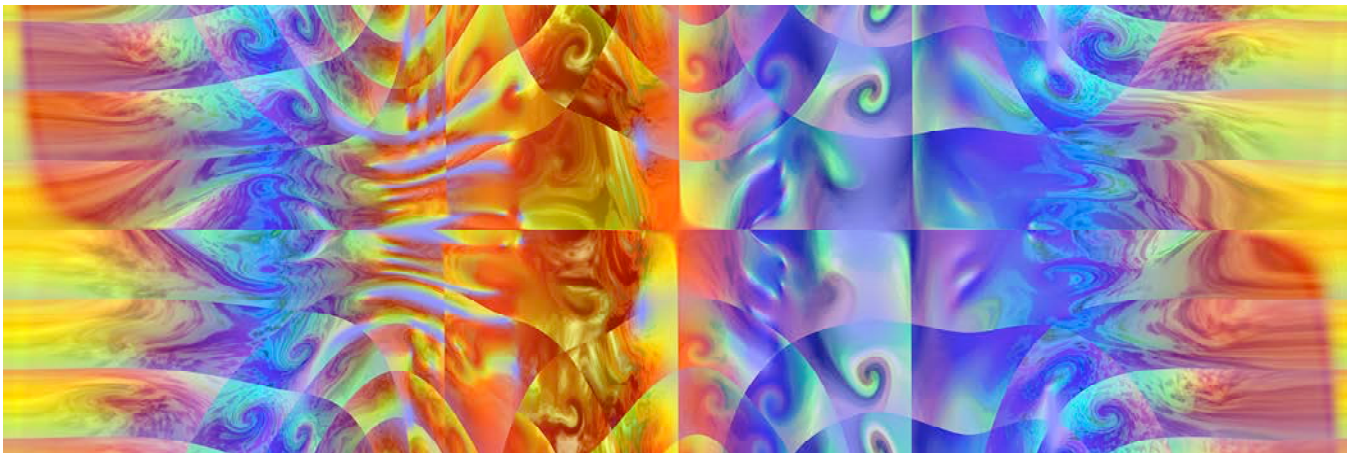
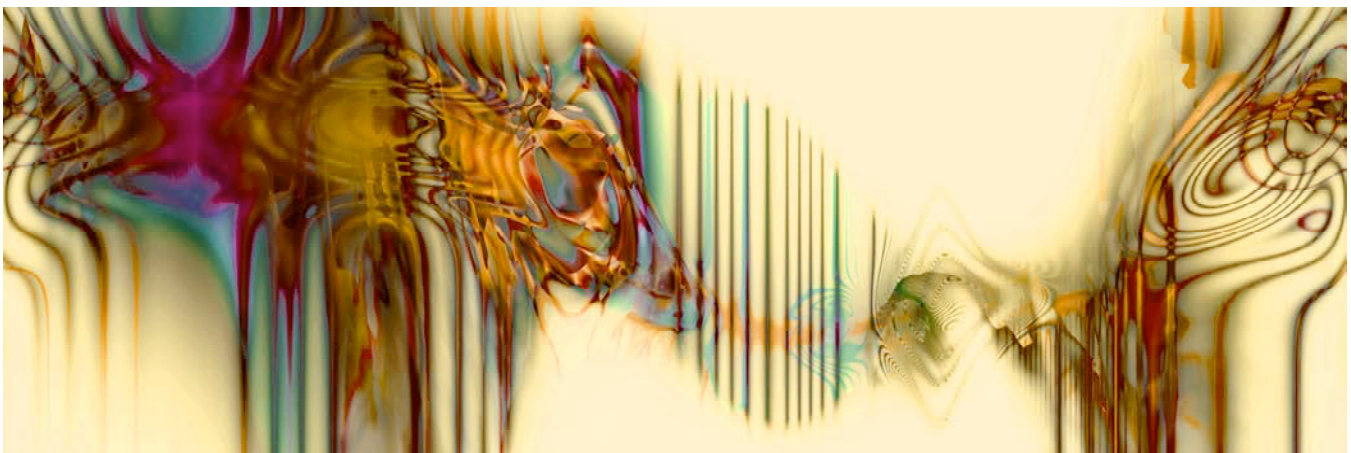**Figure 2: *salia* graphic score (2nd movement), time slice through the center scanline**

Figure 3: *pipilo* graphic score (3rd movement), time slice through the center scanline