TV NEEDS MTV LIKE MTV NEEDS COMPUTERS

pattern potentials for music-with-art

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J. S. Bach's last unfinished work, *THE ART OF THE FUGUE,* is a magnificent network of simple theme and variations that are interwoven, transposed, inverted, and retrogressed. Some believe that Bach's counterpoint, which consists of a *complementarity* of voice-parts, exhibits an affinity with algorithmic computer-program instructions and procedures.* I agree, and I believe that a *video counterpoint* offers a special complementarity between its own musical and its visual voice-parts.

Will computers allow a new art on TV as pure and popular as Bach's music? With suitable talent in place, I believe so. Formal principles can be composed into algorithmic software. But more to the point of this essay, composers can invent algorithms with which to process both musical and graphic rules and aesthetics. In short, there are new *pattern potentials for music-with-art*.

Color and music have more potential for fusion than imaginative composers, poets and artists believed possible. From Aristotle to Scriabin and Wassily Kandinsky, visionaries repeatedly invoked the mind's poetic image of intertwining color with music. Inadvertently, this dream devolved into a kind of collective vision which, after these many centuries, is near to actual realization, hence the spread of TV's present "stylish" pop MTV.

Yet, MTV needs substantiality to realize that ancient collective vision. Computers can contribute substance by expanding music's art of time. The computer's clock allows compositions in time which can be as sensitive as real-time performance. In fact, we've acquired high-resolution numerical control of time itself. Solid-state instant replay, expanded memory plus greater speed and bandwidth sharpen the creative potentials. Graphic geometry, infused with the vitality of color and motion, gains the full emotive power of music. Systems architecture of this decade has produced music and graphic generating capabilities all in one computer instrument. This has become the artist's first *universal machine.*

Founded on a universal-machine concept, my own study of color-in-motion began in 1965 as a search for aesthetic roots while developing software and interim instrumentation. This exploration of computational "digital harmony" gradually substantiated the point of my reasoning. Differential functions within various geometric algorithms generated order-disorder graphics (harmony). Mathematical expressions, plotted frame for frame on film or video, produced subtle clues that helped me to clarify this hypothesis, with each new film.

Eventually, it came to my deeper understanding that a differential arithmetic of resonance actually *embodies* the architecture of music. This arithmetic productively complements a graphic differential geometry. Visual patterns, derived from simple periodic geometry, produce order/disorder resonances in actions which complement the consonances and the dissonances, the tensional dynamics and the universal emotive power of musical rhythm and harmony. These were summary conclusions I was able to draw from my study and films [1,2].

Thus I was able to accept as an operable fact that the basic, quantifiable units of construction for this computer art are: (a) the pixel points of color, and (b) the pure audio sine wave. These two root components enable one to compose periodic and polyphonic artworks in graphics and audio, as if these elements were building blocks with which to construct a generative graphics and a new musical scale. These elements provided a complementarity between sight and sound, and they suggested the foundation for an aural-visual art.

We may compare the implications of two terms often associated with computer music: *synthesis* and *genesis*. My studies suggested that composing music by computer should stress algorithmic or generative processes of genesis. Basic elements, pixel and sine wave, can be generated from "ground up," so to speak, into visual patterns as well as melodic patterns of specific timbres, all by algorithmic rules invented by the composer. This proved to be a departure from most improvisatorial composing procedures of synthesis, for example, often accomplished on real-time keyboard synthesizers.

It seems to me that much creative effort is misguided because of an insensitivity to this major issue of synthesis vs. genesis. The arbitrary wave-form envelopes of all tone synthesizers, keyboard improvisation, and even of present day Expert Systems applications to music synthesis, create a world which is just that: *synthetic*.

Our experience will finally teach us that a computer instrument offers a genuine potential for audio-visual art that is *not* synthetic and *not* a synthesis or an imitation of the creations asociated with either the gallery or concert hall. Computer art belongs elsewhere in a different cultural community. Television needs music-television just as much as MTV needs good computer-graphics and computer-music. Here, we might employ Expert Systems more wisely than merely to imitate a grand piano.

The very concept of genesis prompted my ideas about *pattern potentials for music with art*. Filmmaking demonstrated to me that all twelve-tone methods and traditions, requiring fixed tunings, notation and instruments, could be replaced by acoustic algorithms in association with graphic algorithms. Here was new methodology for digital harmony. I had uncovered the harmonic basis for composing music in interactive interplay with color design and action. Located outside instrumental/vocal traditions yet retaining a valid harmonic foundation, digital harmony may (or may not) be a new and different approach for an evolving species of composer/artist.

My guess is: a powerful appeal lies within the natural interlace and active coordination of eye to ear, and ear to eye, at the integrated level of digital aural-visual harmony. But who's to foresee the expressive power of these relationships until they're brought to life in many, many successful works of art? Some have doubts about the power of *harmonic pattern*, but we must not forget what is already well known. Examine the twenty or so fugues in Bach's last work to see how harmonic pattern, *constructed from a mere twelve tones*, probes the depths of human feeling.

A computer's expanded, heterosensuous opportunities for art were never before understood; without digital systems, they weren't even subject to exploration. Now, overnight, the methodology is at hand. Long ago the refinement of the Baroque family of musical instruments opened floodgates, permitting certain music that has been popular now for some three hundred years. Just so, we may expect that the perfection of realtime audio-graphic computer instrumentation (including a feasible interface with TV) promises an avalanche of popular work among those *pattern potentials for music-with-art*.

Art's relation to its instrumentation is the ongoing subject of interest; my own experience shall provide this concluding anecdote:

It was with a homemade device, a simple sinusoidal pendulum array and optical-printer instrument, that my brother and I composed our first *international success* in the rarified avant-garde of '40's-style MTV. This early triumph implanted in our minds an urgent lifelong drive to gain access to a perfected facility that would provide music and graphic capabilities unified within one instrument. This was at least thirty years before computer technology would make that instrument a reality.

Out of the strength of our convictions regarding this instrument, we conceived an *indelible dream of auralvisuality* within a brand new artform. Thereafter, reflectively, for years I envied Domenico Scarlatti and Antonio Solar, who, by royal or Papal largess, were provided the instrument and the patronage with which to compose hundreds of simple essays exploring a keyboard artform that was mostly of their own invention. Would that brother James and I had had such a "gift" of instrumentation. And yet, it's here!

*The manuscript of the *ART OF THE FUGUE* might be described as an algorithm used to translate the notes into real tones every time instrumentalists elect to perform Bach's musical composition.

REFERENCES:
1. Whitney, John, *Digital Harmony*, McGraw Hill, New York, 1980.

2. Whitney, John, *John Whitney — Visual Pathfinders Series*, Pioneer LaserDisc Corporation, Tokyo, 1984.