Ideas and influences

Tony Longson.
ART/animation CalState, Los Angeles
5151 Rancho San Pasqual
Los Angeles
CA 90032
Tony.Longson@calstatela.edu <http://tonylongson.com/>

As an artist who uses computers I present some justification and rationale for doing so within the context of my creative ideas and influences.

Art. Computers. Construction. Stereo Vision. Stereopsis. Motion Parallax. Francesco Borromini. Piet Mondrian. Arthur Mole

1. INTRODUCTION

My art is based on an interest in our visual perception of three dimensions. Three things go in to our reading of depth and volume. Stereopsis is the learned ability to make sense out of the two slightly different images of the world that our eyes provide to our brain. Motion parallax is the apparent relative shifting of objects at different distances in our visual field as we move around. Also our understanding of space is predicated on experience.

2. EARLY WORK

Group Theory Grid was my first 'construction'. John Ernest was visiting the studio at Reading University and showed us how group theory's symmetry operations could be used to generate patterns that had interesting visual qualities.

I made a 3D construction of lines on four sheets of transparent plexiglas. There were a number of things that appealed to me about the experience of looking at this. It changes quite markedly as one moves around. Motion parallax seems to be enhanced. Seen from straight on there is some ambiguity about what surface the lines are on. The horizontal / vertical lines reinforce the depth whereas the diagonal lines, which form a flat grid, seem to hover in space. Furthermore all of the decisions made in coming up with the visual form are there to be discovered, somewhat like a puzzle, to anyone interested in doing so.

Made in 1967 Group Theory Grid predates my use of computers, but the visual experience that it embodies have provided the foundation for most of the work that I've made since then.

Figure 1: *Group Theory Grid. 1967. Print on Plexiglas. Gemeentemuseum, the Hague, Holland*

3. COMPUTERS

In 1973 I was introduced to computer programs that could display 3D line drawings on a 2D screen. I was

very excited by the prospect of having an image determined by a set of rules embodied in a program.

The control structures in a programming language can have a direct visual identity, iterations through visual elements with successive transformations are one of the hallmarks of early computer art; constrained randomness is another.

Detail and accuracy are features of page description languages such as Postscript or the vector-based ActionScript from Adobe that allow an artist to deal with visual ingredients that could not easily be done by hand.

Unfortunately, computer graphics is essentially a 2D medium. One of the challenges for me was to find ways to use 2D output to make 3D constructions. Early line plotter drawings were geared to making graphs – I could not use them effectively. However, I did have some success with the micro-film plotter at University College, London. I was able to blow up the 35mm output to a reasonable size without too much loss of detail.

The flat bed plotter at the Slade School, though unreliable, was a step up, as I could make a 'same-size' original.

Figure 2: CRS. 1975. Print on Plexiglas

In the mid 1970s I was working at the Hatfield Polytechnic (now University of Hertfordshire), and had access to a computer-controlled 3-axis milling

machine, complete with technician. This opened up new possibilities. For example, the milling machine had switches for the x and y movement of the cutting head. This encouraged me to work with four-fold symmetry.

1986 provided a significant advance in what kind of imagery I could tackle. That year saw the commercial launch of laser printers that used Postscript. I could write programs in some language such as C to manage the formal and structural parts of my work and use Postscript to describe the marks. I was able to provide a detailed and accurate same-size original for the screen printer to print on plexiglas, which I then engineered into a 3D construction.

Figure 3: Square Tonal Drawing. 1986. Print on Plexiglas

I firmly believe that the materials and creative processes that one uses should inform the work itself. For example, computers let me work with far more detailed imagery than I could otherwise. This has given a level of visual complexity where order and chaos can vie for the viewer's attention. In a similar but more pragmatic vein, printing would suggest that each of the four sheets in my construction be identical; programming, symmetry and simple rules to determine where each element lies let me do this. The sheets in these constructions are identical, but each is rotated 90 degrees with respect to the next one.

I became interested in using recursion to provide a 'space filling' path along which geometrical marks are drawn. Three or four iterations of a simple path can

provide a great deal of seeming complexity. Usually I provide clues to this fractal structure by giving each generation its own visual significance, in the weight of the line, or the curliness of a mark, for example.

Figure 4: *Pool #2. 1990s. Print on Plexiglas*

4. INFLUENCES

To this point I have outlined some of the ideas that make up my work. Equally important are some of the outside influences which I will describe briefly with references for those who want to explore them.

Figure 5: *Tin Toy*

One of my earliest memories as a child was holding a toy car, roughly pressed out of tin, with printed detail, including the driver who appeared in profile on the

side window and face-on in the windscreen. Was there a real person inside? If I flipped fast enough between the two views, perhaps I would see him in 3D.

Figure 6: *Arcade in Palazzo Spada, Rome. Francesco Borromini. 1653*

Dr Kerry Downes was Professor of Art History at Reading University during my time there as a student. He introduced me to many of the unusual uses of 'false perspective' in architecture, most notably the false perspective arcade in the Palazzo Spada, Rome. Borromini has built what looks like a long majestic colonnade. In fact it is quite a short passageway. The floor slopes up, the ceiling gets lower and the arches get smaller with distance as they might appear in a perspective drawing. The experience of this is quite amazing, not like an optical illusion where one either sees it or not, but as a visceral puzzle that confuses one's stereo perception and one's motion parallax.

Disneyland in Anaheim, California uses a similar device on Main Street. On entering visitors see an impressive boulevard stretching out ahead of them. On leaving the park the same street seen from the opposite end looks just a step or two to the exit gates.

Figure 7: *Grey Lozenge*. Piet Mondrian. Gemeente Museum, the Hague, Holland. 1918

Mondrian's 'Grey Lozenge', 1918 has always been a strong influence. In the early 70s I saw it at the Gemeentemuseum in The Hague, Holland, many times. The painting is a compelling study of space and depth. Although reproductions of the work make it look somewhat mechanical, close observation reveals that Mondrian spent lots of time subtly shifting the position and thickness of each of the lines in the composition.

Figure 8: *Mars from NASA's Viking 1*. 1976

When NASA's first Viking probe landed on Mars in 1976, it sent back impressive images, not taken through a camera lens, but with a 'flying spot scanner' which took thousands of sequential light readings that were transmitted back to earth and used as pixel values to recreate the scene.

Two things interested me about these images. The first was that they were usually almost 360 degree panoramas with odd distortions of the space craft itself in the foreground. Secondly the images were made up of pixels – something new to me in those

days. The surface of Mars seems to be covered with small fairly evenly sized rocks. Somewhere into the distance, the rocks are about the same size as the pixels. At this point the pixels cease to represent anything other than themselves. In art historical terms, abstraction becomes non-figurative.

Figure 9: *Arthur Mole*

Arthur Mole was a British photographer working in the U.S. during the First World War. He arranged troops on parade grounds in the form of iconic images when seen through the viewfinder of his plate camera atop a specially constructed tower. The images have all of the ingredients I like – pixels, in this case human pixels, which get smaller into the distance, coupled with an anamorphic distortion which defies the ghost-like landscape from which it rises.

5. CONCLUSION

A question often asked is 'Is the computer just another tool for the artist?' Clearly it is a useful addition, perhaps indispensable to many artists, but I would argue that computer graphics and programming can achieve the status of a 'Visual Language'; one that provides original processes and methods and also allows and encourages us to think about creativity in new ways.

6. REFERENCES

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