

# Generative Art and Aesthetics

Susan Happersett  
249 4<sup>th</sup> street  
Jersey City, NJ 07302, USA  
E-mail: fibonaccisusan@yahoo.com

As artists who choose mathematical principles as their theme, we are blessed with a never-ending stream of content. Many art, writing and film schools offer seminars in content generating. Whether it is basic numerical arithmetic, algebra, topology or other higher-level studies, there is an abundance of fertile areas of mathematical work to explore. The challenge is to take these ideas and create aesthetically artistic work, art that somehow speaks to others on a non-mathematical level as well.

By using mathematical laws, formulas, and algorithms, our work falls into the category of Generative Art. Philip Galanter offers one of the most accepted definitions for Generative Art:

"Generative Art refers to any art practice where the artist creates a process such as a set of natural language rules, a computer program, a machine or other mechanism, which is then set to motion with some degree of autonomy contributing to or resulting in a complete work of art." [1]

By developing a grid work and mapping process, I have plotted various numerical properties. These graphs allow me to examine the aesthetic characteristics of functions, sequences and series in a visual language. I have deconstructed the placement of the strokes to eliminate any literal meaning. It is the number of strokes in each grid that holds significance. Although I do not use a computer in the production of my drawings, I do use mathematical algorithms to determine the number of markings drawn in each square of the grid. Each drawing is planned out mathematically ahead of time. The mechanism I use to make my type of generative art is manual mark making.

As an artist I must ask myself when does this generative process lead to a successful work of art. It seems to me that using an interesting formula and an algorithm to generate an image does not necessarily create art. There is an extra element, a hidden step in the decision-making that yields a work of art. In making the judgment of whether a process successfully initiates art, I am led to the thorny question, what is art?

In trying to grapple with this question, I decided to go outside of my comfort zone of art theory. Since my experience in art is based in modern and post-modern tenets, I looked to a philosopher that was pre-modern: Kant. I was particular intrigued by two statements from his "*Critique of Judgment*":

When we judge free beauty (according to mere form) then our judgment of taste is pure. Here we presuppose no concept of any purpose for which the manifold is to serve the given object, and hence no concept [as to] what the object is meant to represent; our imagination is playing, as it were, while it contemplates the shape, and such a concept would only restrict its freedom. [2]

In his second Critique Kant says that the "beautiful and sublime agree on a point of pleasing on their own account. Further they agree in not presupposing a judgment of sense or one logically determinate, but one of reflection." [3] To me it seems that Kant is telling us that the aesthetic value of an art work is not

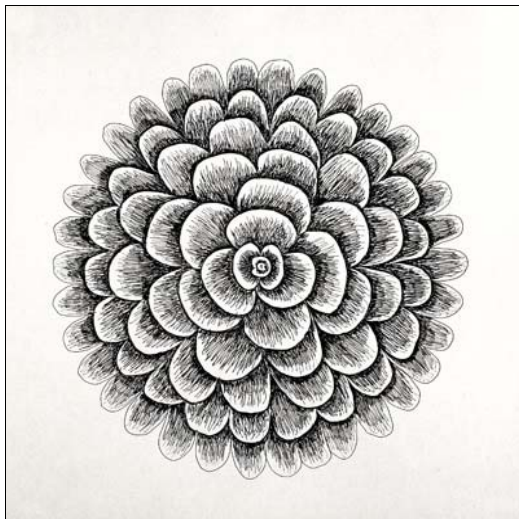
necessarily determined by the content or the subject. It has more to do with how the viewer responds to the work, regardless of the generating concept of the work. When you take a mathematical principle or formula that you find astonishing or sublime, will it be as intriguing when it is translated into a visual image? Going a step further will the completed work of art be interesting with out the knowledge and comprehension of its basis in Mathematics. In other words: Will it engage a non-mathematics person?

Bringing these ideas back to the studio, I embarked on making some adjustments to my processes to test out the concepts of aesthetics in relation to my generative art. I tried three experiments. One challenges the visibility of my markings. Another experiment was displacing grids in the system, and then in the last experiment I applied my favorite mathematical sequence (Fibonacci) to a classic subject of aesthetics.

I hope to intensify the viewer's interaction with my work by making the markings subtler. I decided to make drawings in white ink on off-white paper. I could not actually see the markings while I was working. I just counted and stayed within the grid. It is not until the ink dries that the pattern is evident. These subtle white-on-white drawings take my work to a more intimate place, putting more emphasis on the meditation. It is as though the image comes out of the paper like magic.

The second new approach I incorporated into my drawing was inspired from nature. I have been saying all along that my use of the Fibonacci sequence was based on idealized growth patterns in plants, but plants rarely grow in idealized conditions, roots hit rocks, bugs eat leaves, etc. By displacing or switching grid spaces, I hope to express these imperfections. The plans for these drawings start just like all of my other drawings, but before I start the actual drawing process I select a few sections of the grid and alter them by trading one designated section for another. I am trying to create a sort of static energy and also make the viewer question whether this was a mistake.

**Figure 1:** *Fibonacci Flower, 2005*



The final experiment involves a complete change of parameters. I wanted to use the basic Fibonacci sequence to make a work of art that reflected one of the most accepted subjects in art - the flower. I created a series of eight concentric templates, the smallest with a 1" circumference, the second with a 2" circumference and each of the next consecutive circles having a circumference 2" larger than the previous circle. The first circle was kept whole and contains 1 petal within 1 petal. The next was divided into 2 equal chords and houses 2 petals. The next circle divided into 3 equal chords and 3 petals. The next circle divided into 5 equal chords and 5 petals. Then 8, 13, 21, and finally the largest circle divided into 34 chords and I drew 34 petals. The final structure is a type of Fibonacci-based, genetically engineered flower.

Working within a strict system to generate art, it becomes natural to continue to make art along the same process. I find it is important to step outside of the process and challenge one's work aesthetically. In doing so the artist may even discover new concepts.

## References

- [1] Philip Galanter, [www.philipgalanter.com](http://www.philipgalanter.com), Jan 2005.
- [2], [3] Immanuel Kant, *The Critique of Judgment*, Trans. Werner Pluhar, Indianapolis: Cambridge, 1987.