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Abstract

An artist-educator discovers how a STEAM-based approach to making art brings together a variety of subject areas in surprising ways.

Author/Artist Bio

David Rufo is a professor in the Graduate School of Education at Fordham University. His art explores perceptual phenomena & autobiographical memory.

Keywords

STEAM, Contemporary Art, Fibonacci Pattern, Parabolic Spiral

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David Rufo

I have long admired the way artists incorporate dot patterns in their work. The Pop artist Roy Lichtenstein's use of Benday dots, the spot paintings of contemporary artist Damien Hirst, and the teeming speckled environments found in the installations of Yayoi Kusama. The dot patterns that emerged in my paintings a few years back eventually settled into circular shapes that radiated out from the center of the works. The circular arrays anchored the compositions and freed each painting from a fixed vertical or horizontal orientation. Although my paintings were optically charged, I felt they lacked the dimensionality that I found intriguing in the works of other artists whom I admired.



Figure 1. Author's painting titled, Icarus (2016)

One day while flipping through a book on the artist Ross Bleckner, I came to an illustration of his 1993 painting, *Botanical Study*. Similar to mine, Bleckner's painting contained a dot pattern that radiated from the center of the work with no discernable orientation. However, Bleckner's painting was described as "mesmerizing" (Milazzo, 2006, p. 124) and contained a richness that mine lacked. It seemed to move, shift, and breath. Perhaps the most apt description came from Bleckner himself who used the phrase, "alchemy of the surface" (Leila Heller Gallery, 2016, p.2) when discussing his work. Upon closer examination I was able to ascertain that one source of this alchemy was the placement of the dots.

In both paintings, the dots radiated to the edges in a series of concentric circles from the center of the works. However, in my painting the dots were placed in straight lines whereas in Bleckner's they were situated in an alternating pattern. I decided to incorporate this patterning and found that my paintings too began to move and breath.



Figure 2. Detail of the author's painting tilted, Tilt-A-Whirl (2017)

But it was not until I happened to be traveling on the train to New York City that I learned the mathematical implications of what I had stumbled upon. Seated next to me was a neurosurgeon who noticed an image of my painting on my open laptop screen. He informed me that my dots were arranged as interlaced parabolic spirals much like the Fibonacci spiral. In my paintings I had unwittingly replicated a Fibonacci patterning similar to that found in nature. One such example is the seed heads of sunflowers. The spirals of seeds in the head of a sunflower often approximate Fibonacci mathematical patterning (Swinton & Ochu, 2016) creating dynamic visual oscillations and the perception of movement where there is none.

As an artist and educator I am enthralled by the ways in which various disciplines and subject areas naturally intertwine. What began as a simple artistic endeavor, led to a conversation with a scientist, a lesson in mathematics, and a greater awareness of pattern structures found in nature. All these lessons now inform my art making.

A STEAM approach to education provides similar learning experiences in the classroom. When teachers allow learning to encompass a broad range of subject areas such science, technology, engineering, the arts, and mathematics (STEAM), students are afforded opportunities to engage in discovery, make connections, solve problems, and enjoy aesthetic experiences. Alchemy indeed!

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