Svelte Connections: An Artist's Perception of Mathematics

Michael C. Hirschfeld

As a visual artist studying engineering I am interested in where the two fields overlap and the mathematics within. After visiting the Museum of Mathematics in Manhattan, I see the line between the two as significantly blurred. Throughout the museum a theoretical means of discovery common to art and mathematics is seen. Within the context of the museum, we can see multiple instances of concepts originating as mathematical being translated into real world materials that result in great visual effects and create the parameters for personal, experiential discovery. I did not have to go far into the museum to find exhibits that inspired new ideas about the intertwining fields of Math and Art. Sitting adjacent to one another the exhibits *Pattern Mesh* and *Structure Studio*, in two and three dimensions respectively, show paths from mathematical concepts to art and from artistic practices back to math.

In the informational material for *Pattern Mesh* there are examples of artists and designers who have used moiré patterns in their work such as a collaborative work by Patricio Andrade and William Ruffenach as well as a moiré tape installation by Carsten Nicolai who has a whole series of sculptural works inspired by moiré patterns.[1] Unsurprisingly, Carsten Nicolai was trained as an architect, a field that embodies the intersection of numerical figures and aesthetics.[2] I was reminded of an artist I knew in my college sculpture classes who overlapped window screens of various sizes, and a quick Google search of art and moiré patterns yielded the artist Tom Orr who makes installations using a similar technique.[3]

The exhibit *Structure Studio* immediately reminded me of another sculptor I recently came across online named George W. Hart who is also a professor in the engineering school at Stony Brook University.[4] By using numerous computer generated mathematical models, Hart is able to create complex and often organic forms that would very likely be impossible to realize with a purely tactile approach. At the Museum of Math, Zometool Inc. has provided a system for creating structures large and small by using mathematical formulae, and I discovered that George W. Hart is featured on their website for a sculpture he made using Zometool. Additionally, Hart has helped to design the Museum of Math itself. One of the founders of the Zometool's technology was Steve Baer who was said to be fascinated by the work of the

architect Buckminster Fuller, famous for his geodesic domes among other creations, which closely resemble many of the forms created using Zometool.[5]

Although math can inspire art it seems that art can also inspire math- related concepts. In viewing exhibits in the Museum of Math like *Shapes of Space* and the *Hyper Hyperboloid*, I recalled one of my favorite sculptors of the late twentieth century Kenneth Snelson. Snelson used the structural principle that came to be known as tensegrity, usually attributed to Buckminster Fuller, to achieve most of his important pieces.[6] After Snelson created his innovative *X- Piece* of 1948 Fuller applied the principle in the development of his famous geodesic domes.[7] Although not purely mathematical, tensegrity has had applications in architecture, and biology; it is interesting to see the mathematical model for the Tensegrity Icosahedron (apparently developed long after Snelson was first working on his sculptures) employing the principle. Both math and art rely on heavily theoretical and conceptual underpinnings to achieve tangible applications and both fields can be applied as a means of discovery in the other. The exhibits in the Museum of Math exemplify this dynamic interplay and allows for greater appreciation of this innate beauty.

Acknowledgement: Thanks to Professor Satyanand Singh for useful suggestions and recommending this assignment which gave me the opportunity to make these connections.

References

1. Museum of Mathematics, Pattern Mesh Exhibit
2. http://www.carstennicolai.de, Website of Carsten Nicolai
3. http://www.tomorr.net, Website of Tom Orr
4. http://georgehart.com, Website of George W. Hart
5. http://www.zometool.com/about-us, Website of Zometool
6. Gómez-Jáuregui, V (2010). Tensegrity Structures and their Application to Architecture. Servicio de Publicaciones Universidad de Cantabria, p.19. ISBN 8481025755.
7. Gómez-Jáuregui, V. (2009). "Controversial Origins of Tensegrity". International Association of Spatial Structures IASS Symposium 2009, Valencia.

Nominating faculty: Professor Satyanand Singh, Mathematics 1375, Department of Mathematics, School of Arts & Sciences, New York City College of Technology, CUNY.

Cite as: Hirschfeld, M.C. (2015). Svelte connections: An artist's perception of mathematics. *City Tech Writer, 10,* 88-89. Online at https://openlab.citytech.cuny.edu/city-tech-writer-sampler/