Euclidean Resonance

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One of the designers spent much of his undergraduate career studying the sciences where his focus was interrupted by the photographs and illustrations depicting the sacred geometries of life. Often, the designer would get distracted by the beauty of nonlinear mathematical expressions in nature. The fascination of topological equations of intersecting dimensions creating patterns that were mirrored in our physical world has led to the creation this design. The designer saw that the same patterns illustrated by nonlinear mathematical equations were showing up in his biology textbooks being called 'spiral radial cleavage' (cell division patterns of fertilized cells).

Similar to the cell division patterns found in biology, those patterns can also be found in ancient black-white ornaments occurring in history. According to Radovi and Jablan (2001) who studied ancient ornaments and the development of ornamental structures and its different cultures in time found that simply applying symmetry design is difficult to comprehend how they are constructed. However, they discovered that complex and complicated ornament structures can be analyzed by simply using several basic elements that are sometimes symmetrical and multiplied by a very simple algorithmic rule which is called modularity. By arranging a simple symmetrical pattern by using repetition or alternation or rotation rules (left, right, left, right, etc.), an infinite series of patterns can be obtained (Radovi & Jablan, 2001). Using similar algorithmic rules and modularity that have been used over the history, designers developed and created the large-scale interference patterns by weaving an opaque gradient pattern of four tangentially touching spheres to be overlaid on an offset orientation of the first pattern. For this phased Euclidean pattern to appear, the two gradient patterns of four arranged spheres were identical but rotated at a 45 degree offset from each other. The purpose of this design was to create a woven fabric surface wearable inspired by spiral radial cleavage patterns that occur through cell division as well as applying modularity that have been used in ancient historic tile/ornament art.

As a result, designers created a woven fabric surface with the appearance of a floral pattern by arranging, over two woven planes, eight tangentially connected circles and intersecting them symmetrically. Designers were able to create third new textile pattern by using an engineered digital textile print with a hand weaving technique.

The original textile patterns were created using Adobe Illustrator. The first pattern composed of four tangentially connected circles filled with a yellow-orange to black color gradient and then arranged in a North, South, East and West orientation. The second set of textile pattern for the weft circle patterns were rotated, in software, 45 degrees off of the North / South orientation.

Those two sets of textile patterns were then woven together and a new flower like pattern emerged from the eight-fold symmetry displayed from the woven intersecting the circles.

One textile pattern with ½" width stripes was created for weft strips and the other textile pattern with ½" width stripes was created for warp strips. These two set of textile patterns were created in Adobe Illustrator and Photoshop and then digitally printed on 100% cotton chambray. To minimize fabric edge raveling, each of the pattern pieces were designed and printed on a bias

grain line. Each 1/2" strip was then hand-cut and woven together to match the original weft and warp engineered patterns that were created in Photoshop.

The cocoon shaped coat was constructed to emphasize newly developed woven pattern as the back of the coat. This design is a unique and original composition inspired by both historical art and algorithmic patterns that occurs in the micro world of biology. This design innovation comes from the use of both digital textile printing and hand weaving techniques to create an elegant wearable art piece that highlights Euclidean geometry and ancient cultures.

References

Radovic´, Lj. and Jablan, S. (2001), Antisymmetry and modularity in ornamental art, Visual Mathematics, Vol. 3, p. 2 (reprint from Bridges Proceedings, 2001, pp. 55-66; available at:www.mi.sanu.ac.rs/vismath/radovic/index.html).