

Assignment

Generative  
Design

Context

Freshmore  
Term 1

Course

Computational  
Design Thinking

Date

2024

Student

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Instructor

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Dr.

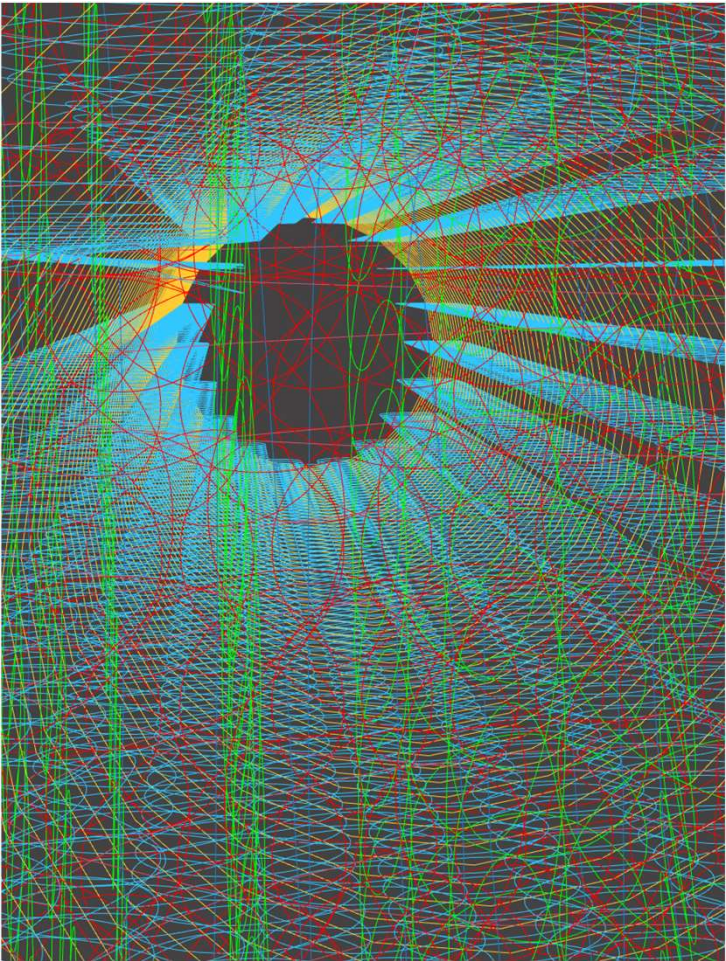
<The Junction>

The initial idea was to model the movement of the moon around the Earth, and the Earth around the Sun, an orbit around an orbit. In trying to achieve that, multiple variables, parameters and mathematical functions were used to bring the final design closer to that goal.

Ultimately, that end goal proved too great a challenge to model. However, while trying to achieve that goal, various iterations yielded interesting designs.

The image on the right shows part of the final design, looking outward from inside the cylinders.

The final design is reminiscent of tunnels and other man-made landscapes, looking at any of the axes, one can see a tunnel or a tower. Looking at the structure from various vantage points reflect various structures in the modern world.



## &lt;Testing Phase&gt;

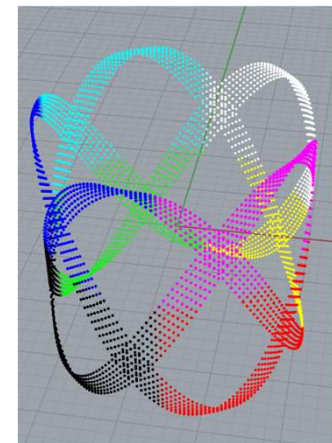
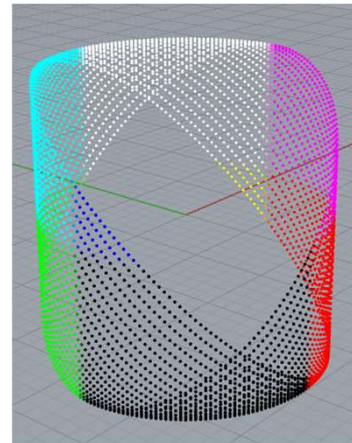
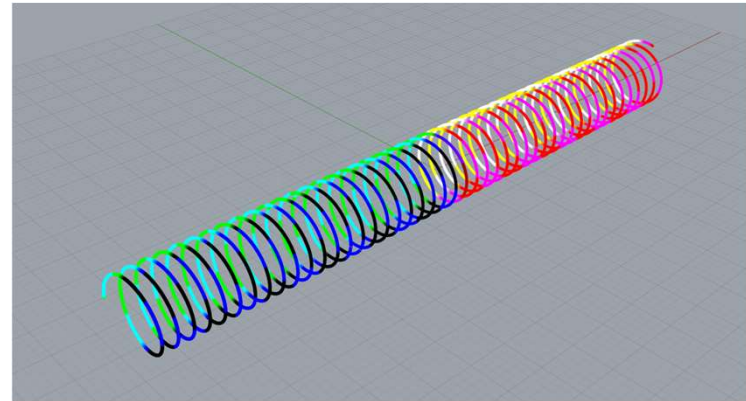
At the base of this design is a simple circle, feeding values into the z-axis gave rise to several interesting shapes such as those seen in 1 and 2.

Initially, the z-values were derived from a sine function, thus the familiar curves in image 2.

By swapping the z and y values, and feeding a regularly increasing y value, a spring emerged. This parallels the orbit of the Moon around the Earth, while the Earth is in motion.

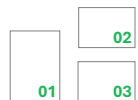
As alluded to earlier, there were some difficulties in trying to close the spring, to form a circle using the spring.

Later images will feature some patterns that have emerged while attempting to overcome this challenge.



## Captions

- 01 Wristband
- 02 Patterned Cuff
- 03 Spring

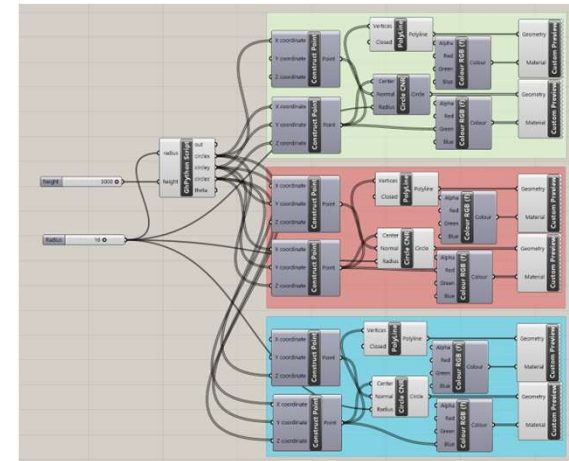


```

Grasshopper Python Script Editor
File Edit Tools Mode Help Test OK

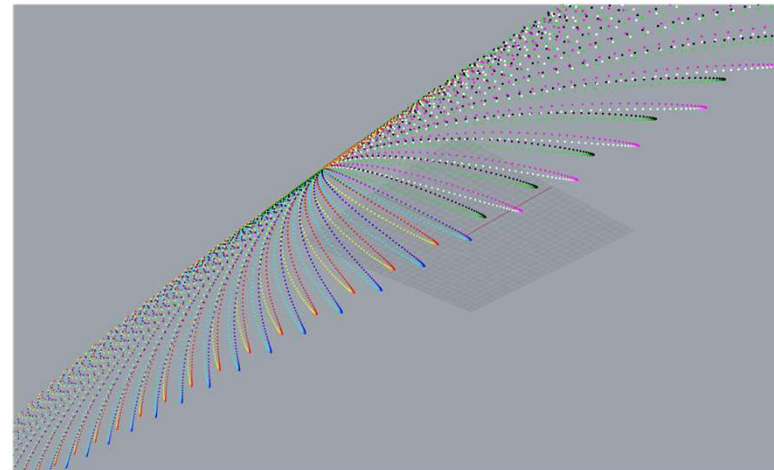
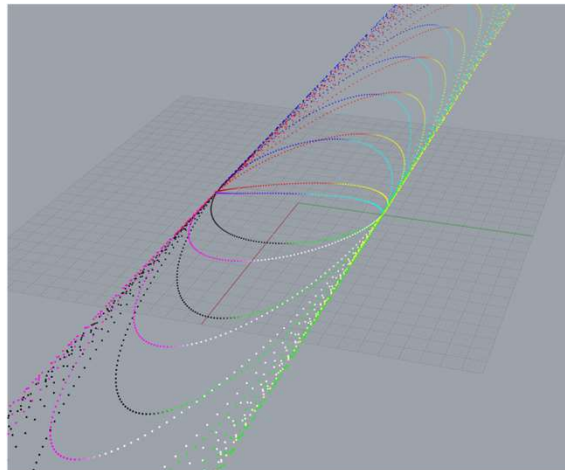
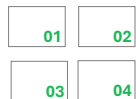
1 """Provides a scripting component.
2 ---Inputs:
3 -----x: The x script variable
4 -----y: The y script variable
5 ---Output:
6 -----a: The a output variable"""
7
8 __author__ = "tanru"
9 __version__ = "2024.10.01"
10
11 import rhinoscriptsyntax as rs
12 import math
13
14 circlex = []
15 circley = []
16 circlez = []
17 theta = []
18
19 for i in range(int(height)):
20     ---cx = (radius*4)*math.sin(i*0.1*math.pi)
21     ---circlex += [cx]
22     ---cy = (radius*4)*math.cos(i*0.1*math.pi)
23     ---circley += [cy]
24     ---cz = (i - height/2)/4
25     ---circlez += [cz]
26     ---theta += [i*0.1*math.pi]
27
28
29

```



## Captions

- 01 Python component
- 02 Final Program
- 03 Expansion
- 04 Emergence

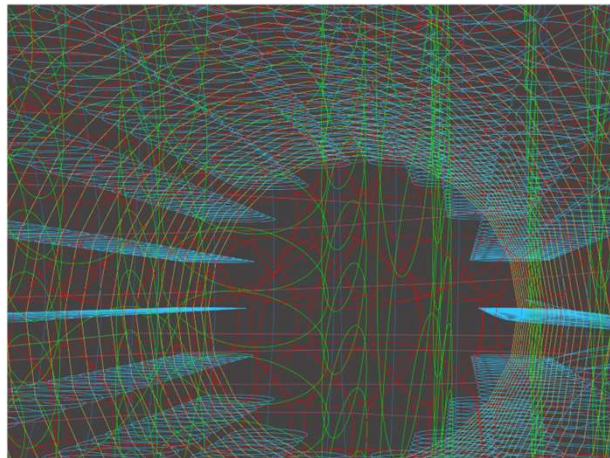




## &lt;The Final Design&gt;

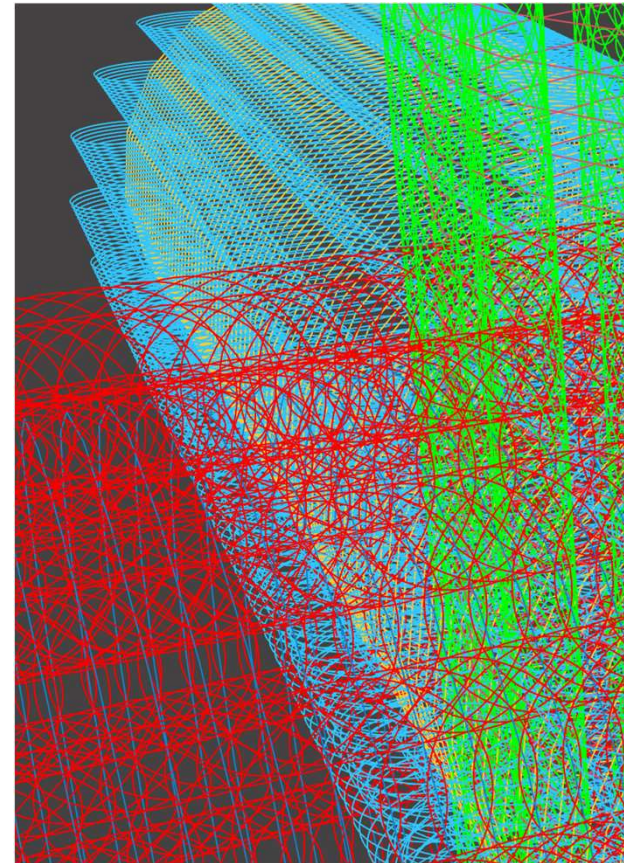
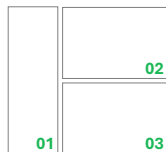
The final design flipped the original idea on its head, instead of having a spiral around a circle, it puts circles around a spiral.

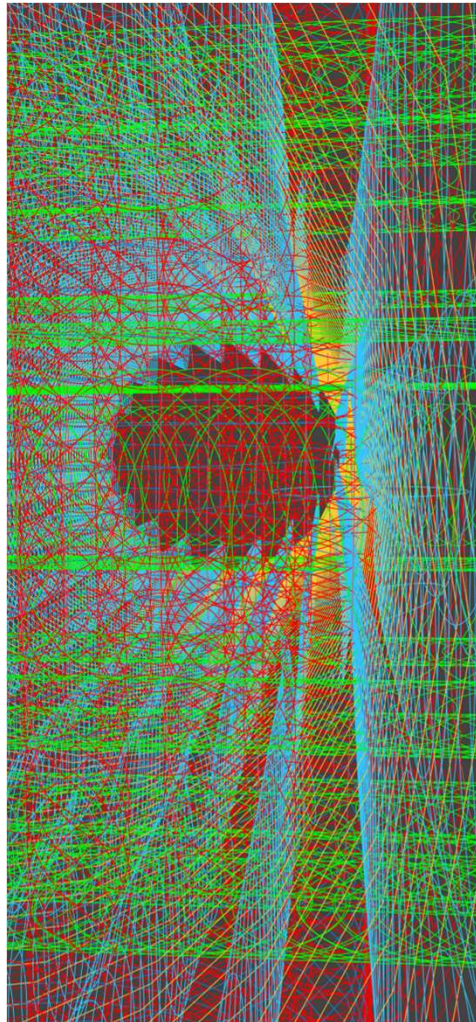
By reflecting the original column about the other axes, a 6-way joint is formed. Several recognizable formations can be observed from various vantage points on the structure, like tall columns, or underground tunnels and intersections.



## Captions

01 Intersection  
02 Inside the tunnel  
03 Outside the structure





## Captions

- 01 Looking up?
- 02 Growing tunnels
- 03 Inside look

