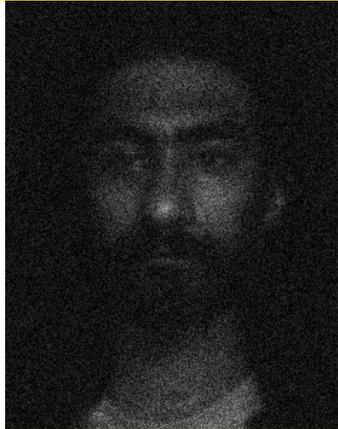


GAGANJIT SINGH

Artworks : POLYHEDRA MORPHOLOGIES AND DRAWING MACHINES



Topic: Image & Space

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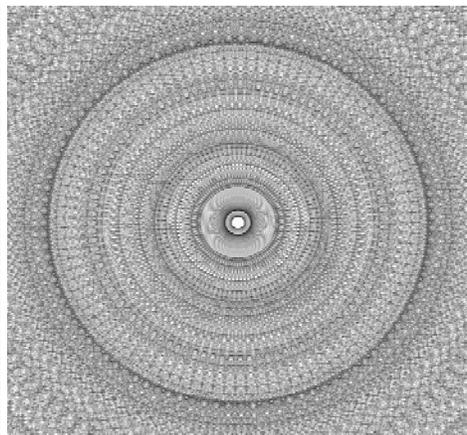
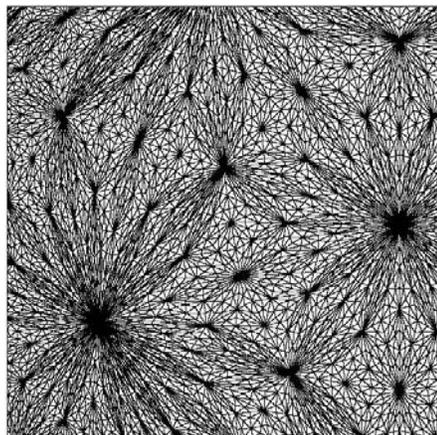
Abstract:

I would like to present at this forum, a series of generative artworks. The medium of exploration of the artworks is rhinoscript- which is the scripting language of Rhinoceros (a 3d modeling environment). The artworks fall under the following schemas-

1. Polyhedra Morphologies: A study into Generative Systems was carried through a research thesis titled- '*An Investigation of Representation of Generative Systems in the Digital Medium*' submitted at the Faculty of Architecture, CEPT University, Ahmedabad, India (2009) for a degree in Architecture (2010). In the study, the idea of a generative system is illustrated through the generation of 3d polyhedron geometries and their geodesic versions as per specific triangulation type and subdivision methods through rhinoscript. Subsequently, the studies were continued independently, to explore further possibilities of morphological variations.

2. Drawing Machines: The idea of a drawing machine has persisted through ages in different contexts. The rather contemporary ones include- the creations of Brian Eno (2006), Marius Watz (2003) and Desmond Paul Henry (1960). The drawing machine in focus here generates drawings/ rather diagrams, based on certain input parameters from the user into a specified 2d canvas space. Sort of repetitive, iterative representations of patterns at various levels of diagrammatic depth.

Illustrated below are two in-focus outputs of the two schemas of exploration.



References:

*Left: Surface of a geodesic Dodecahedron
Right: An output from a drawing machine*

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Keywords:
Polyhedra, drawing machine, digital, diagram, representation.

Polyhedra Morphologies and Drawing Machines

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Introduction

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1. Polyhedra Morphologies

Polyhedra Morphologies are studies into exploring morphological variations in the formation of Polyhedron geometries as per modes of triangulation, and the type and depth of subdivision, resulting in families of a parent polyhedron.

After exploration of basic Geodesic Polyhedra Families(Figure 1, Figure 2), related Stellations have also been studied(Figure 3, Figure 4).

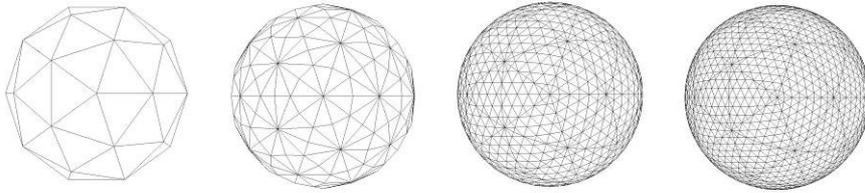


Figure 1: States of a gedecised Dodecahedron (2V,4V,6V,8V) as per Triacon triangulation

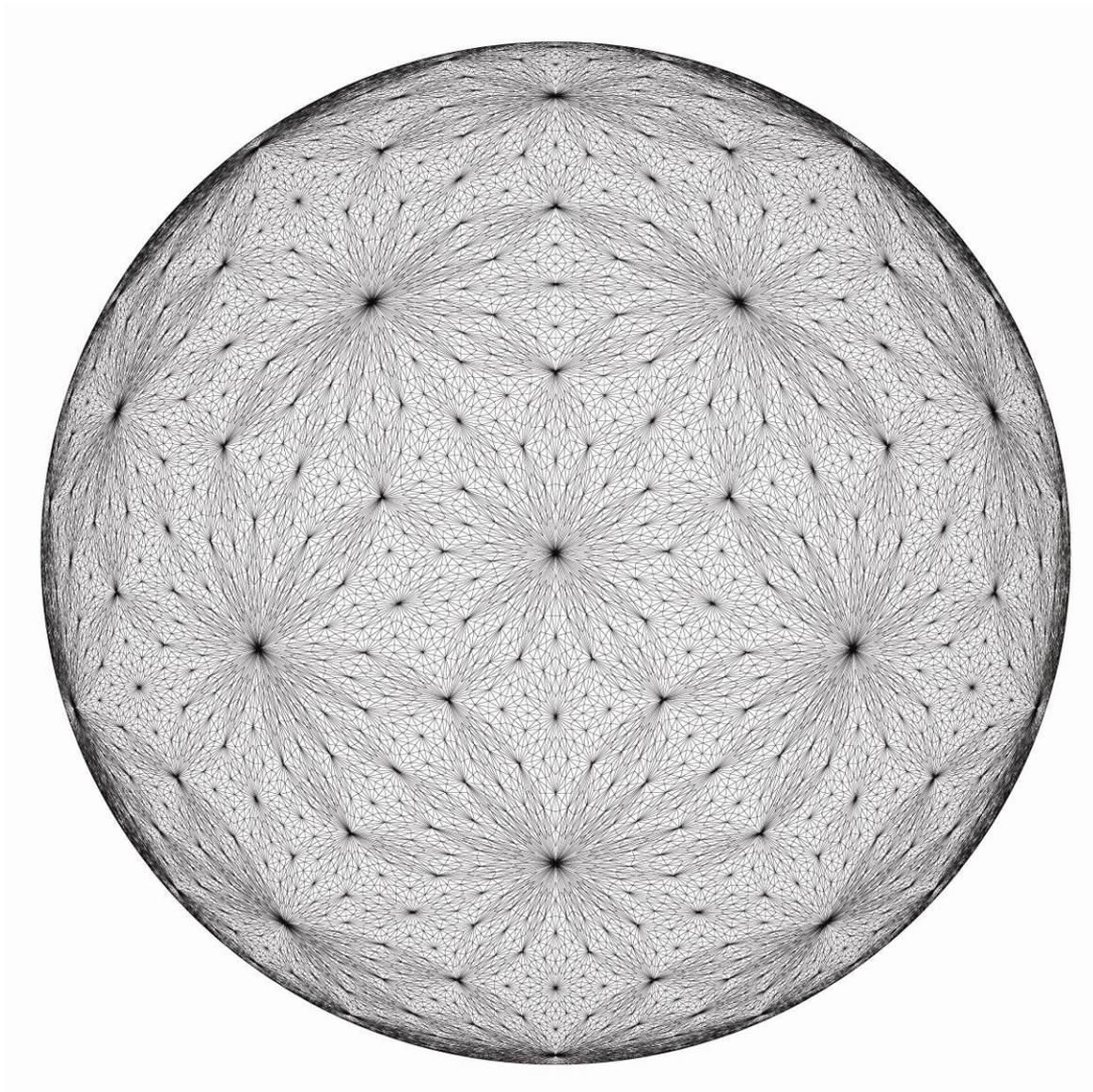


Figure 2: State of Dodecahedron in 4N recursion as per Triacon triangulation

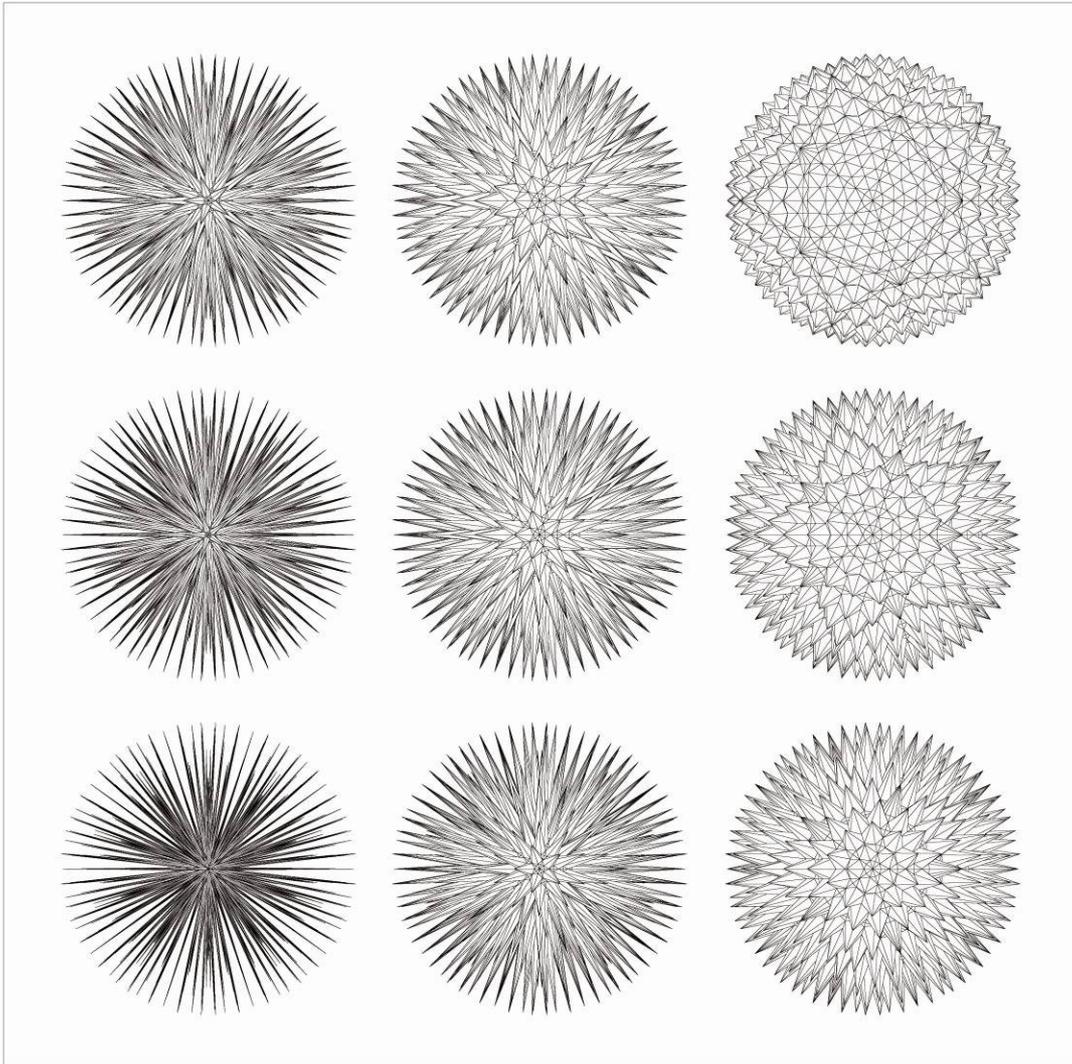


Figure 3: Family of a Stellated Dodecahedron

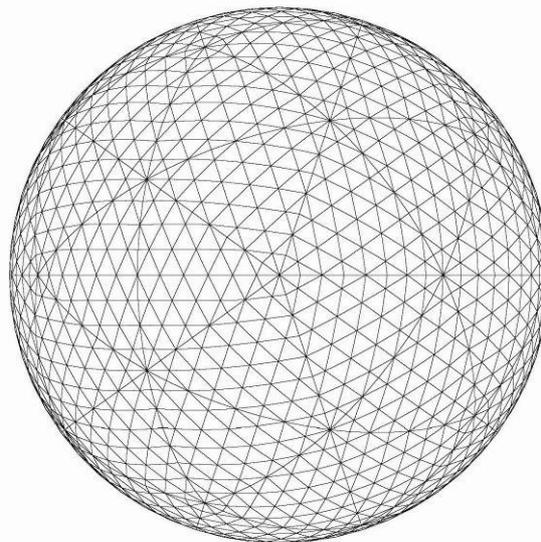


Figure 4: Parent Dodecahedron for the Stellations illustrated in Figure 3

2. Drawing Machines

The term drawing machine here refers to a script that generates patterns in two-dimensional space, in essence a pattern generating algorithm, generating patterns through circles. Two drawing machines are explored. The first machine generates singular bodies of patterns at a certain recursive depth, and limited by the range of the input radii generating the pattern (Figure 5, Figure 6).

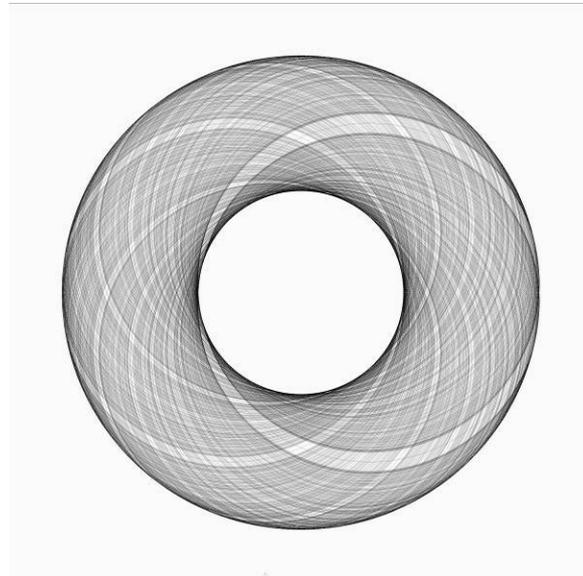


Figure 5: A pattern generated from the first drawing machine

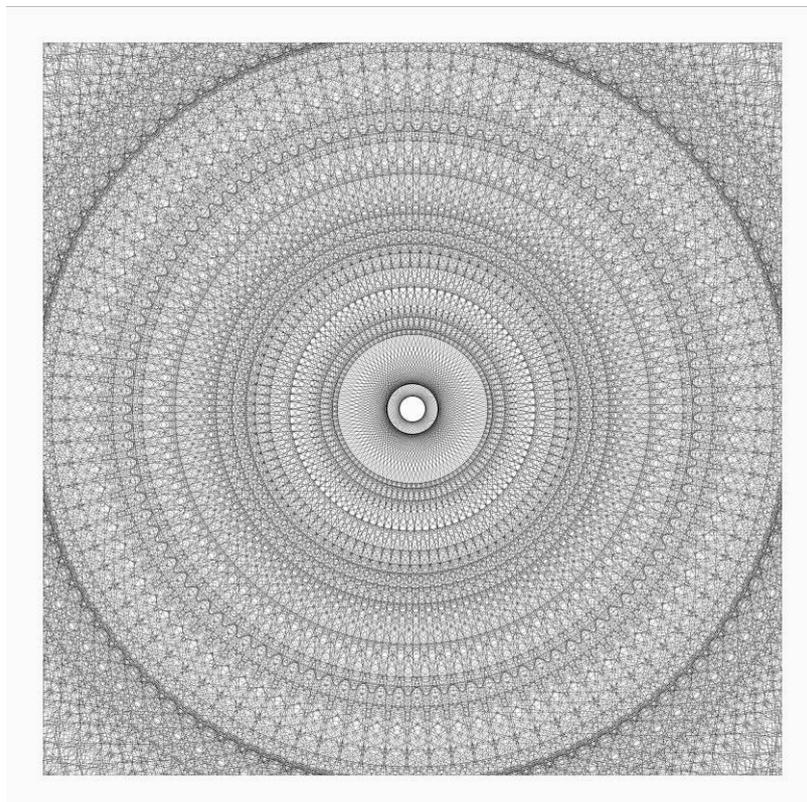


Figure 6: An inset of a result generated from the first drawing machine

The second drawing machine is an advanced version of the previous algorithm wherein overlay of pattern bodies are generated in a 'Canvas Space' defined by the user at the very beginning of the algorithm. The resulting drawing is a random piece

of art, limited and defined by boundaries of the radius range and recursion depth.
(Figure 7, Figure 8)

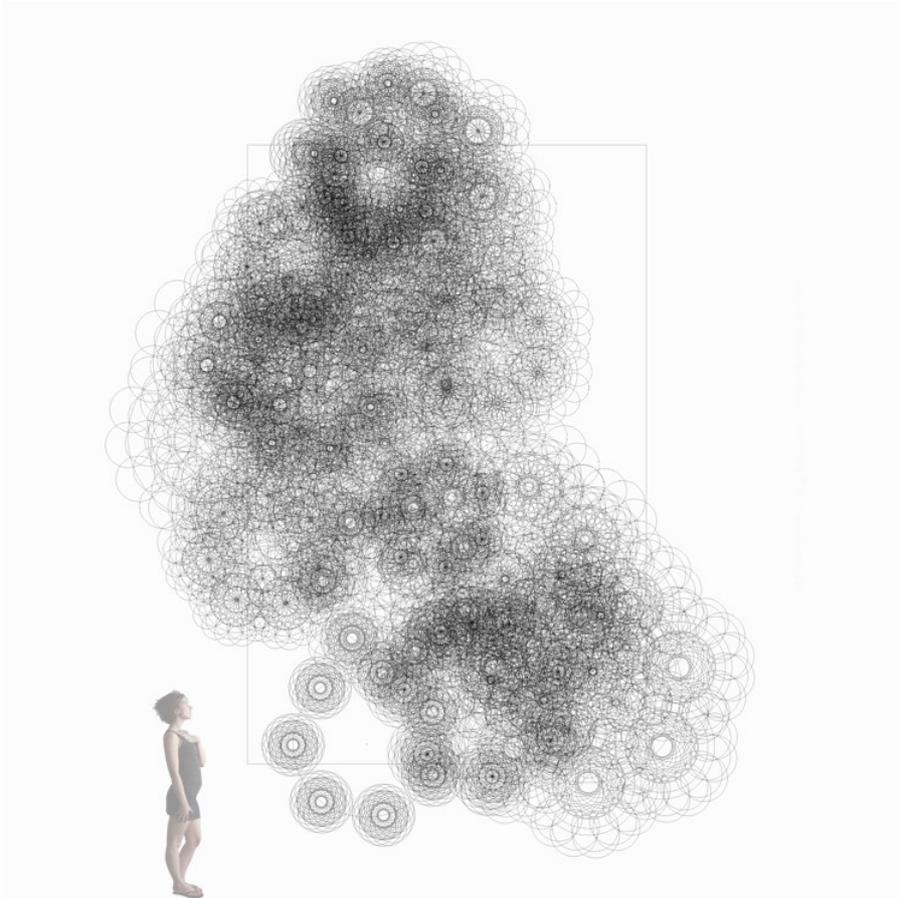


Figure 7: A drawing generated by the second drawing machine

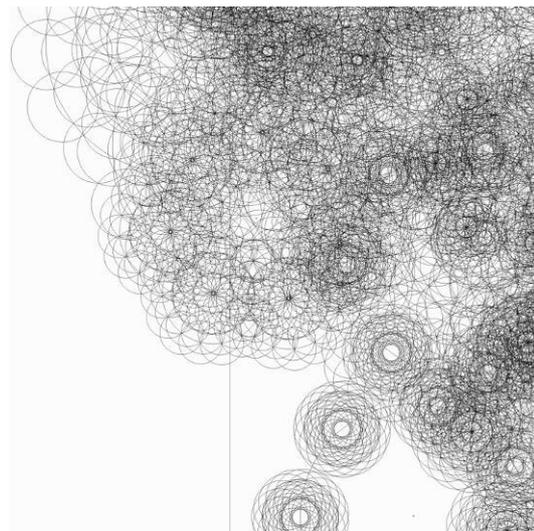


Figure 8: An inset of the drawing shown above in Figure 7