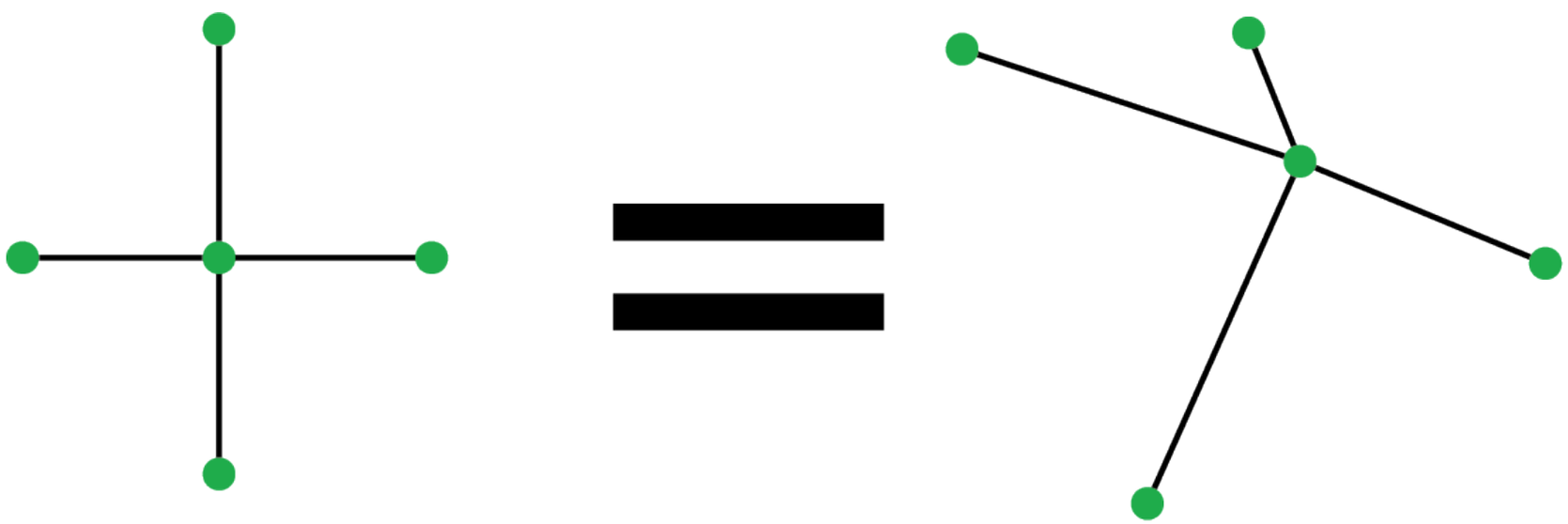
Topological Homeomorphisms

Alyssa Joines

Thesis

An exploration and inquiry into our physical and digital environments, experimenting with structure through the conceptual lens of topological homeomorphisms

Topological Space

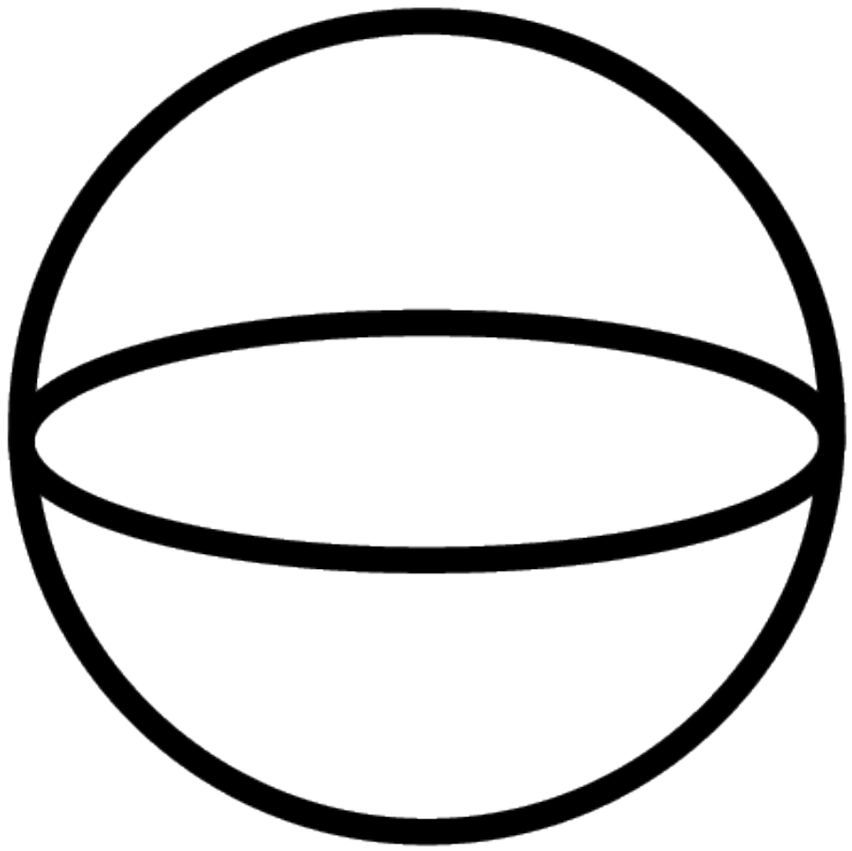


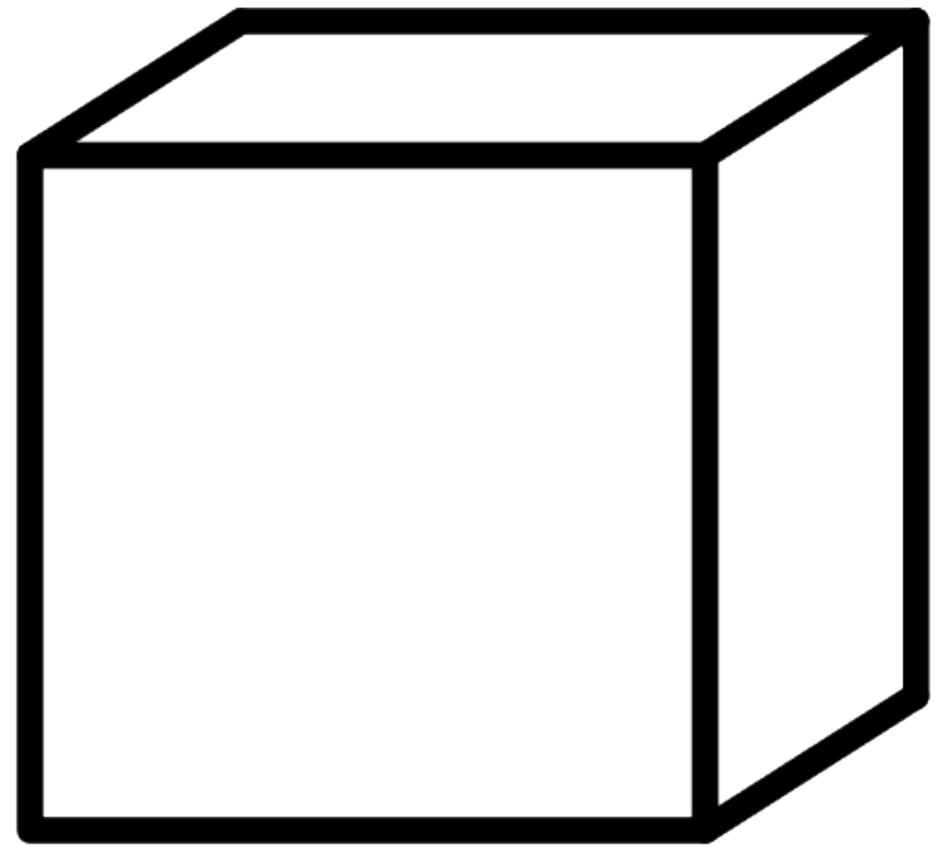
Euler characteristic $= V - E + F$

VERTICES

EDGES

FACES





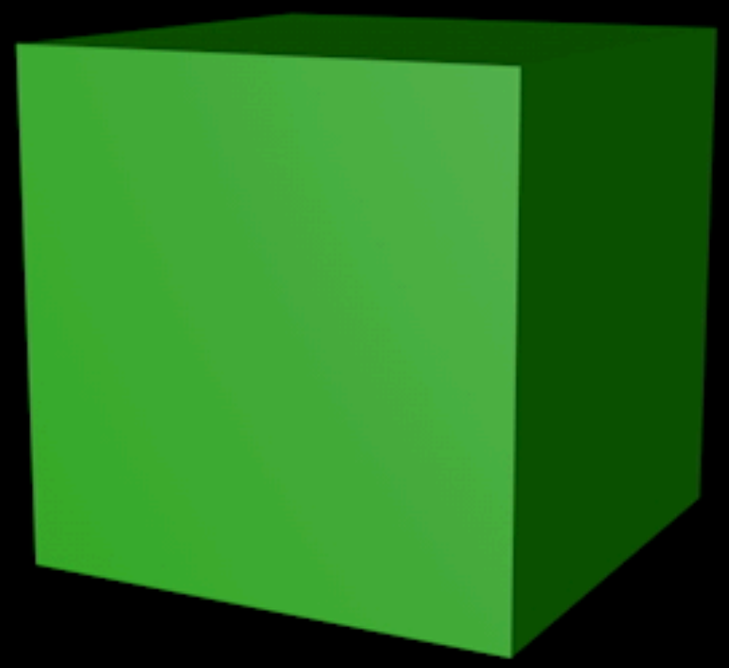
Sphere = 4 - 6 + 4

X = 2

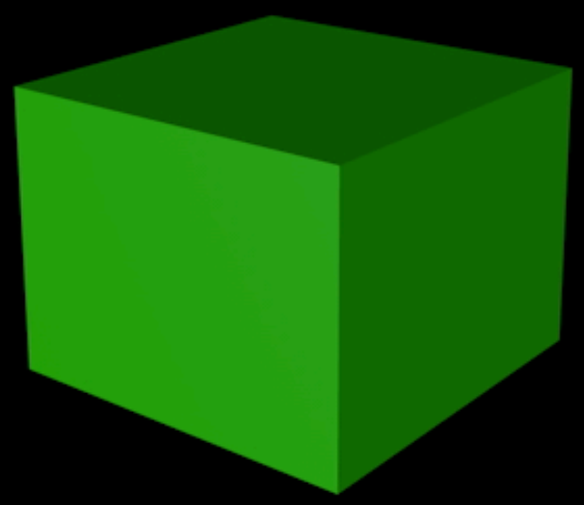
Cube = 8 - 12 + 6

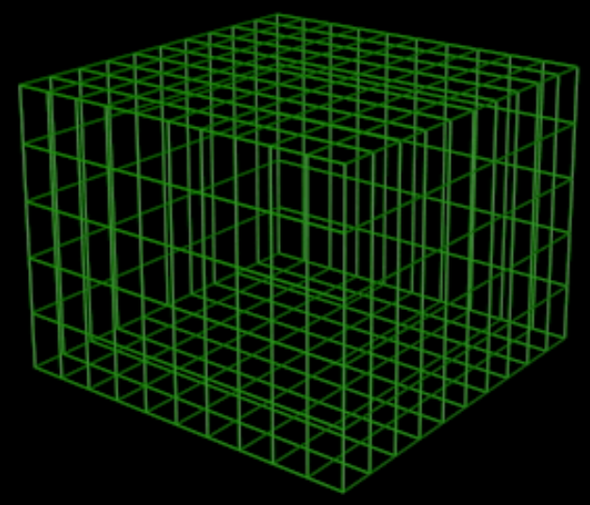
X = 2

Prototype 4: Experiment 1

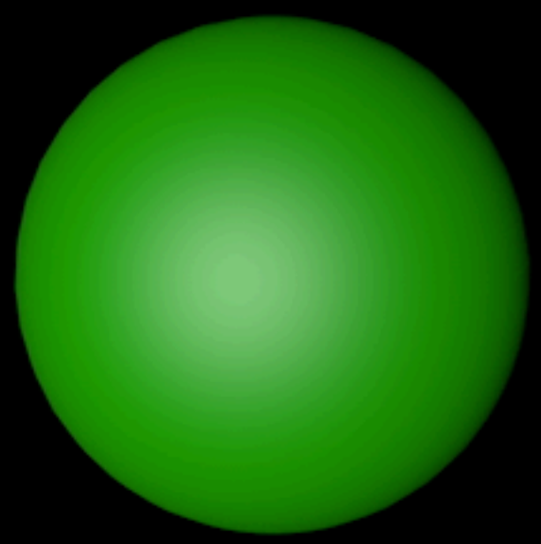


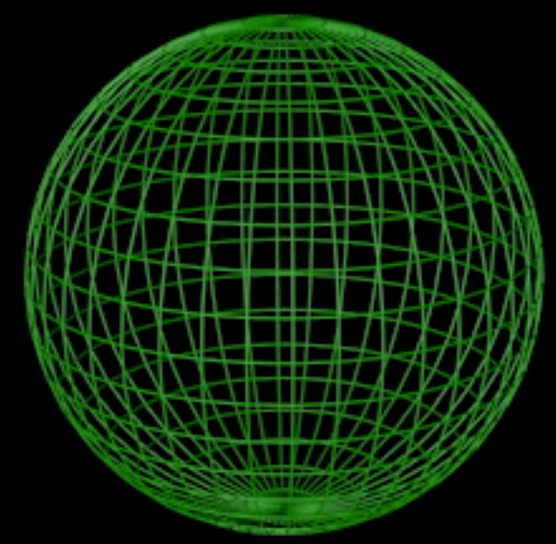
Prototype 4: Experiment 2





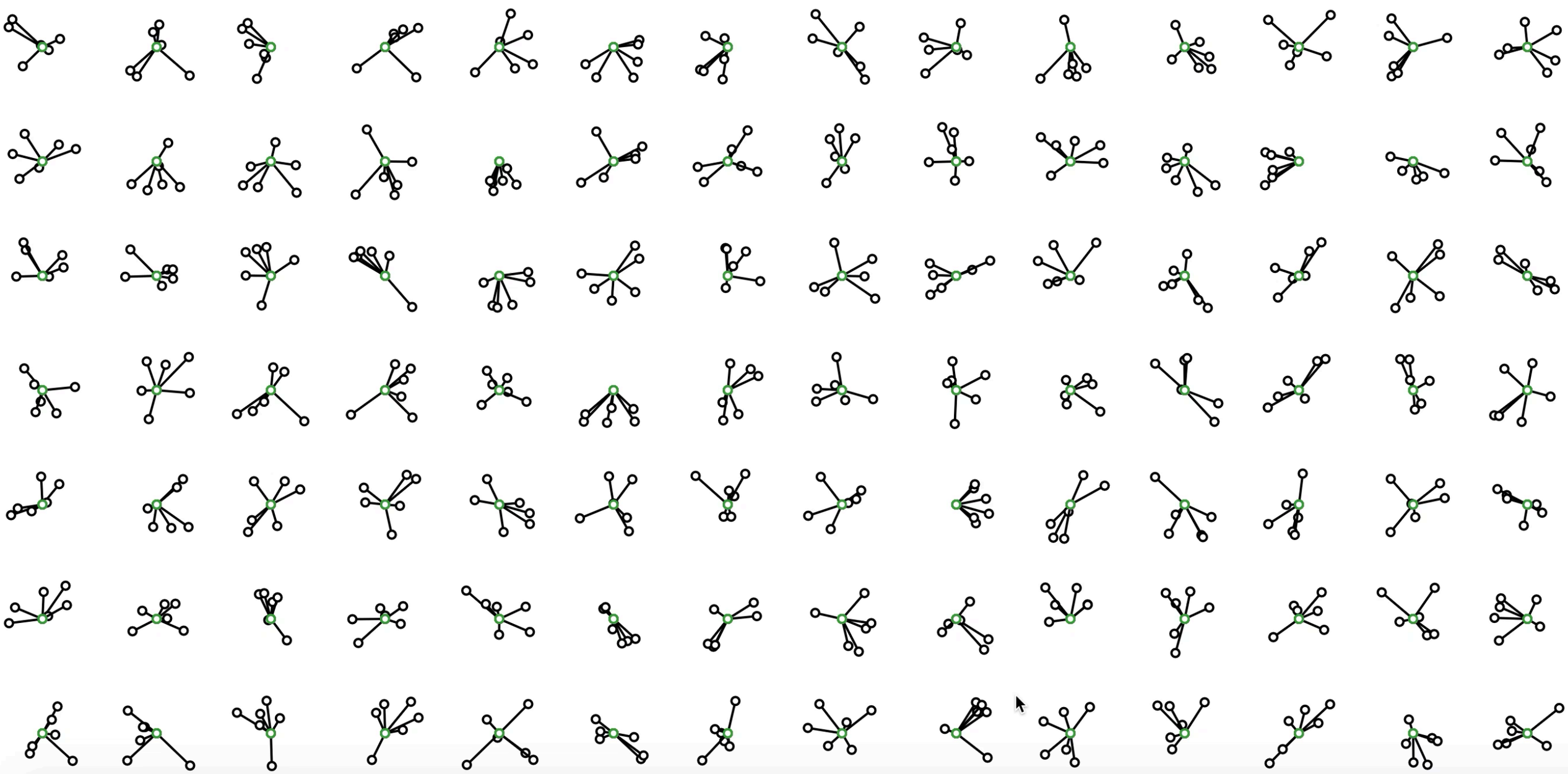
Prototype 4: Experiment 3





Prototype 5

Randomly generating homeomorphic sets with p5.js



Why do we care?

Applications

Data Analysis

Material sciences

Molecular Biology

Robert Lazzarini

Skulls, 2000

(iv)
resin, bone, pigment

(iii)
resin, bone, pigment

Mark Dorf

Axiom & Simulation, 2011

Plate #17

Plate #5

Ernesto Neto

Léviathan Thot, 2006

Key Concepts

Spatial Relationships

Invariance

Transformation & Deformation

Connectedness

Boundaries

Perception

“Topology investigates the fabric of space. It looks into the texture of not merely physical space, but of all conceivable other spaces … Topology resolves the problem of what it is that holds a space together”

- Tate Modern, *Secrets of Space* Seminar Description, 2012

Thank You