4D - Visualizer

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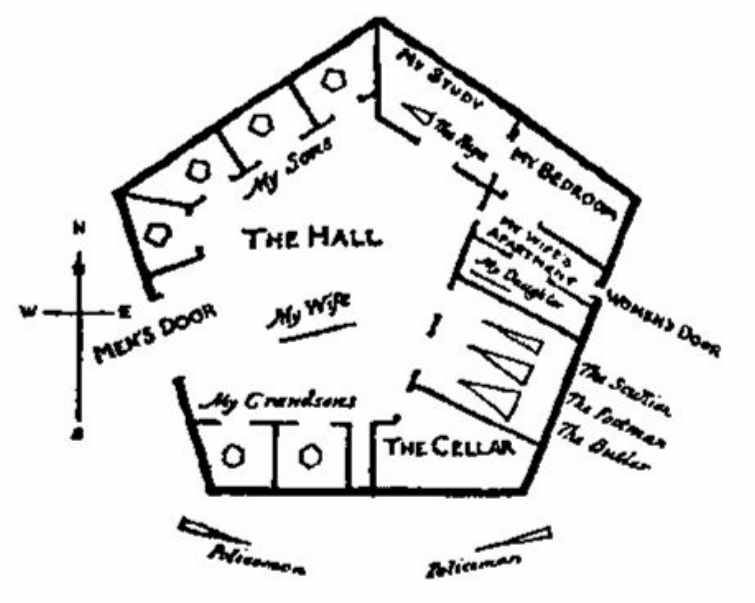
4D - Visualizer

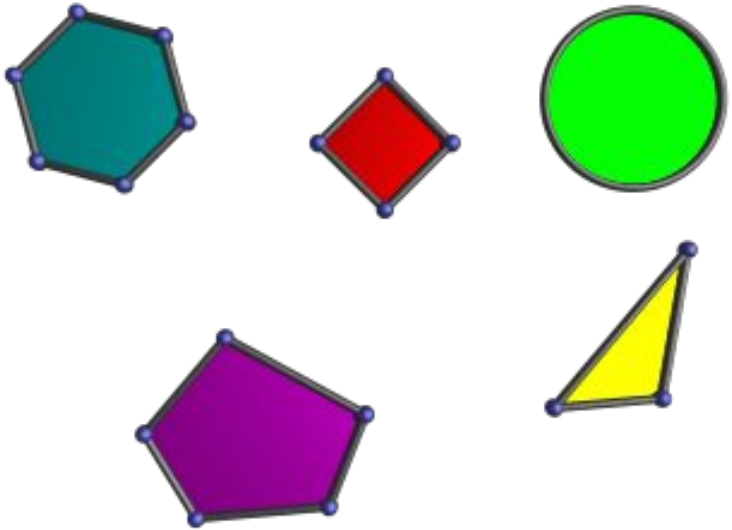
A Tool, To Visualize the 4-Dimensional Euclidean(not space-time) Objects In 3-Dimensional Euclidean Space.

4D objects are visualized by taking its Projection from higher dimension to lower dimension.

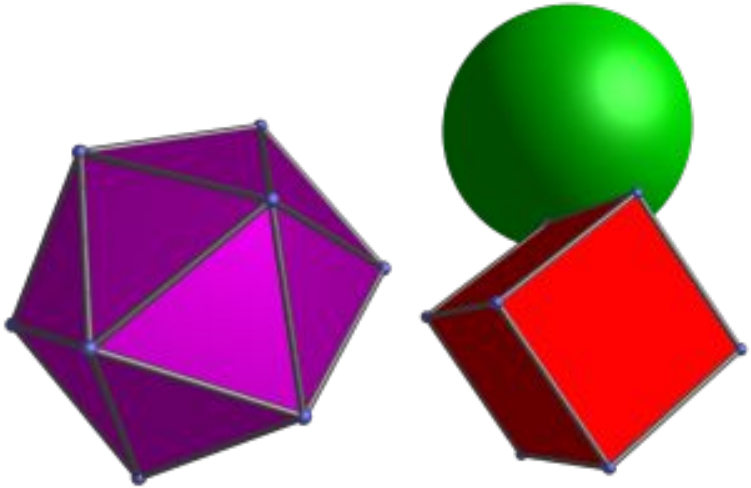
Flat Land: 2D world (x,y)

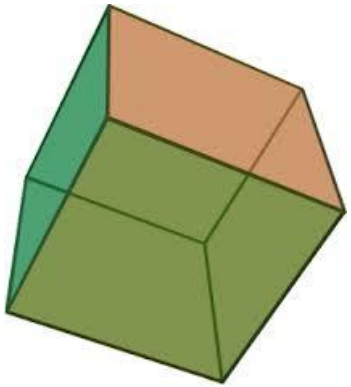
- A novel by Edwin Abbott, 1884





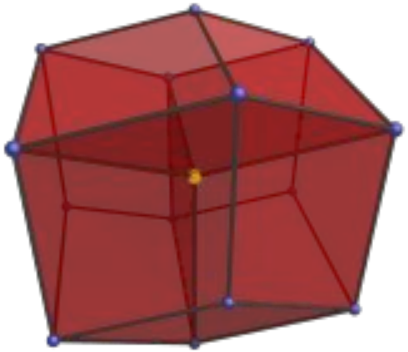
Our 3D world (x,y,z)

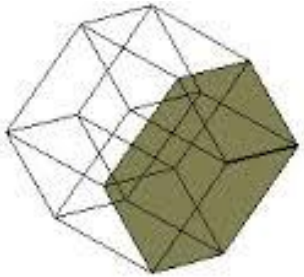


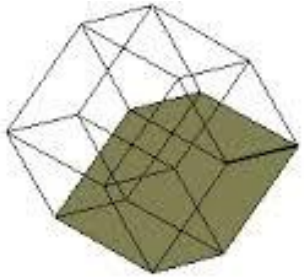


3D Cube

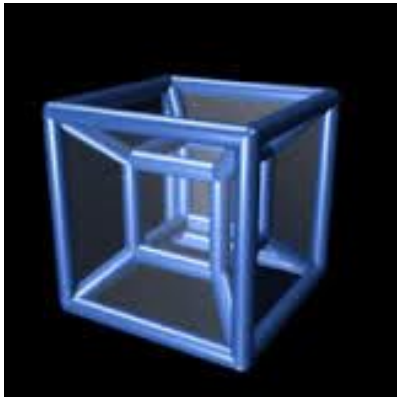
Hypothetical 4D world (x,y,z,w)

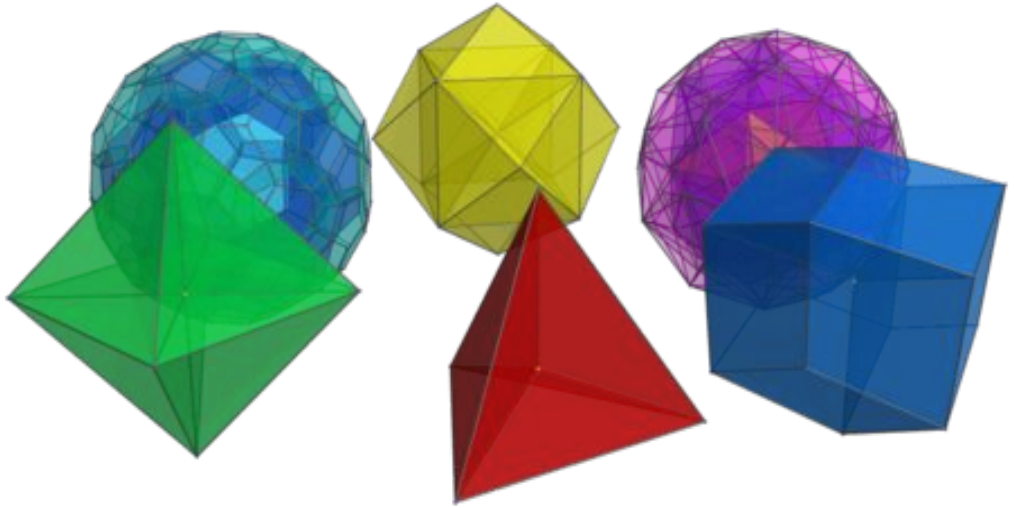






4D HyperCube
Tesseract

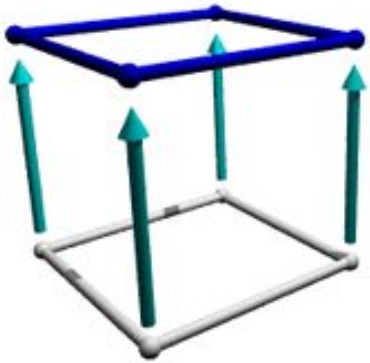




0th to 4th Dimention

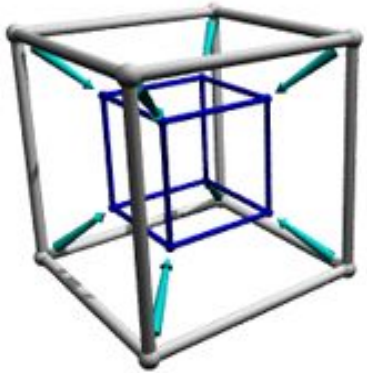
0D

1D

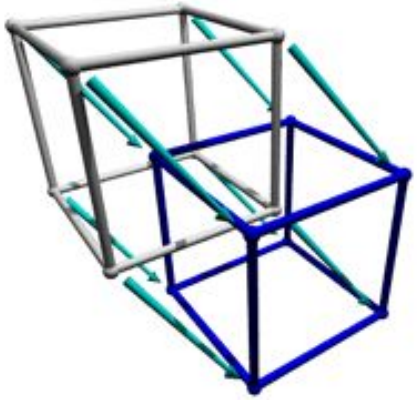


3D

2D

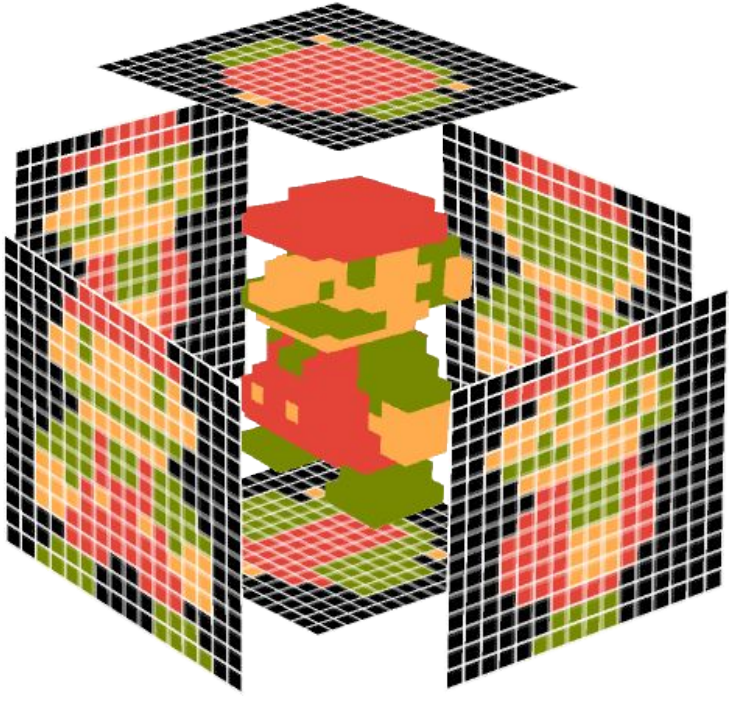


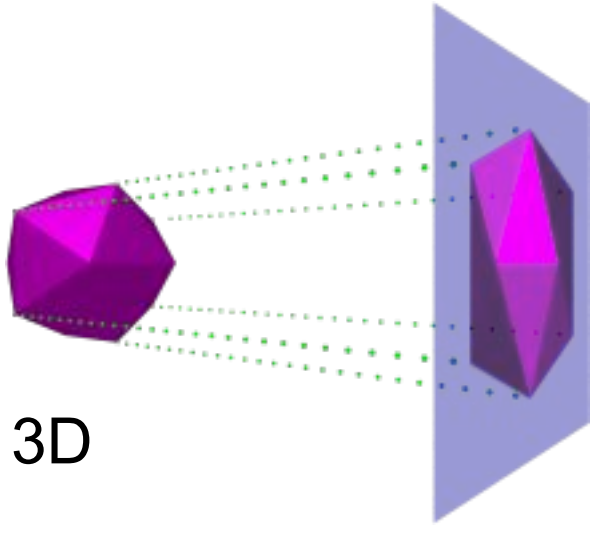
4D



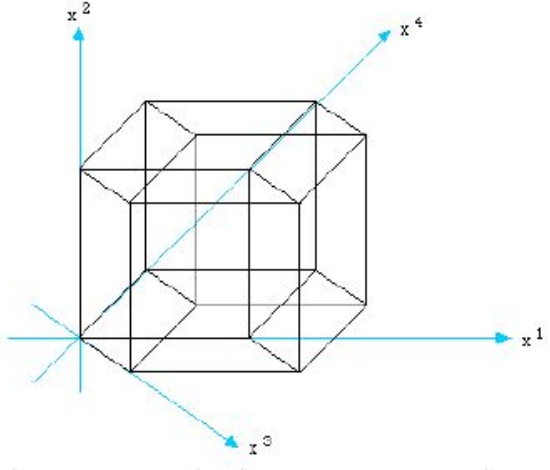
Projection

3D to 2D





4D to 3D

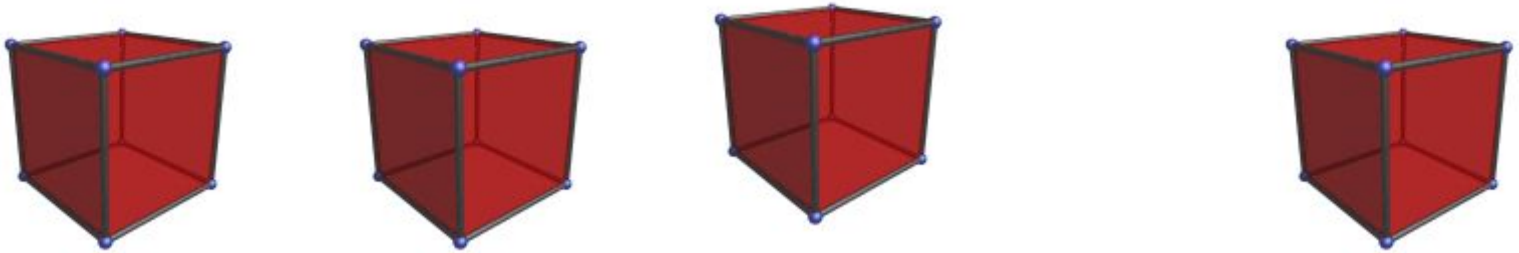


Rotation

Rotation of 2D surface along 3th dimention

The Projection distorts as object rotates in extra dimension to projection plane

Rotation of 3D cube along 4th dimention



4D - Visualizer

- Written in Python
- numpy to process nodes
- matplotlib to plot object in 3D space
- Input: 4D geometry, .obj format(points, lines)
- Output: Interactive 3D projection of 4D geometry.
- Rotation along different Planes in 3D and 4D, to visualize object from different angle .

Demo