Research Topic Outline

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1 Abstract

Although we live in a three-dimensional space, I think it is possible to visualize the 4th dimension using a series of 3-dimensional cross-sections of the fourth dimension. Using a infinite-book technique, I want to demonstrate how to visualize the fourth dimension, and explore some of the properties that this model may contain, determine if they are beneficial, in hopes that others can use and apply them to aid in understanding their work.

2 Background

3 Proofs/generalization(?)

3.1 Generalization

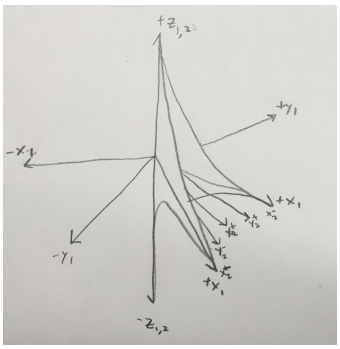
I want to show how my model of representing the 4th dimension can be generalized from the 0th to the 3rd, and then how it can apply to the 4th dimension

3.2 relation(?)

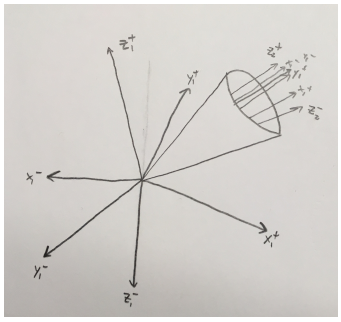
I thought that maybe I can show that my model is consistent with already accepted methods of visualizing higher dimensionality.

4 Illustration

I plan on having many illustrations throughout the body of the paper, since the purpose of this paper is to visualize, however, I'd like some section reserved to just stepping through the visualization. I plan on also including some animations I plan on building which I can link to or embed in the paper.



(a) figure 1



(b) figure 2

5 Exploration(?)

Since this is a topic I've come up with myself, I'd like to talk about some of the properties of the model and see if there is anything interesting or of value about them.

One example (if you refer to figure 1) you can see that the 3D space consisting of x_1, y_1, z_1 and their positive and negative counter parts, takes up a larger proportion of the cross-sectional four-dimensional line segment than the x_2, y_2, z_2 3-space.

In addition, if you look at the two figures, they are both attempting to illustrate the same sort of four-dimensional line segment but interpolating in different ways. In the first one, the two spaces seem to be splitting around the z-axis