SPP @ ULB

Visualizing the hypersphere using 3d printing

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Abstract

One of the hardest things in differential geometry is to visualize the spaces ones are working with. The only shapes one can normally visualize are surfaces, which sadly are a bit boring. Therefore, geometers often draw random blobs on the board, call it an n-dimensional manifold and with a lot of handwaving they try to convince that their pictures make any sense.

A few years ago, a professor approached me with a side project. He wanted to visualize a certain regular triangulation of the hypersphere, called the 600-cell, and he wanted a 3d printed model of this. Although I am not an expert in discrete geometry, I designed and created this 3d model.

In this seminar I will lead you through my journey in the construction of this 600-cell. I will explain the algebraic and geometric properties of this object. I will also talk about the practicalities of 3d printing mathematics and the real-life issues on might encounter.

P.S. In this talk no knowledge of differential geometry is required. However, if you know differential geometry and want to learn about my latest project where I solved a very overdetermined elliptic PDE on 3-manifolds, come to my talk in the geometry seminar on the 21st of October at 2pm.

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