Investigation Into The Representation Of 4D Shapes

04/11/2021

The Weeks Progress Report

Attempts to get Rotors working

- Struggling to derive equations for rotation and rotor multiplication in 3D
- I can get the same equation by finding patterns but I don’t really understand the maths

Developed some 3D representations of 4D objects

- “Onion Skin” - not as intuitive as I expected
- “Timeline” - quite intuitive but curious about how to approach with 3D rotation
- 3D rotation viewport to visualise 4D rotation

Questions

- When it comes to actually testing my software on users, should I still include options that I believe won’t be as effective/intuitive?
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Plan Ahead

Take 2 weeks (Weeks 3 and 4) to research papers focused in the fields of geometrical representation and interaction.

Week 4: take first steps into intuitive rotation

Week 5: rotation mechanic using click-and-drag and an arc/grab ball. - FAIRLY SUCCESSFUL - needs work - Week 8

Week 6: Implement Rotors - FAIL. Begin new Unity project for more polished scenes

Week 7: Implement and test onion skin interpretation of the 4th dimension. Implement a 3D perspective that in real time mimics the 4D rotation.

Week 8: Create intuitive UI/UX for users to manipulate shapes with.

Week 9: Create a demo to "Identify the shape". Add more shapes - 4D cylinder, cone, capsule.

Week 10: Plan and script a walk through for users to play with shapes and attempt to identify them. Set up a new demo for shape matching.

Week 11: Tutorial videos that explain why shapes behave they do, and traits to identify what the shape is. Polish the program to be a "final product".

Am I on schedule

Still keeping on track. My original attempts to implement a rotor were virtually identical to Bosch’s 3D rotor that you sent me, besides rotation and rotor multiplication which I still haven’t been able to derive.