

Introduction

This report details the process and outcomes of the CS405 Project 1, which involved the utilization of ChatGPT for creating and animating a 3D cube object. The project was segmented into three primary tasks, each focusing on different aspects of matrix calculation and animation in 3D graphics.

Task 1: Matrix Calculation with ChatGPT

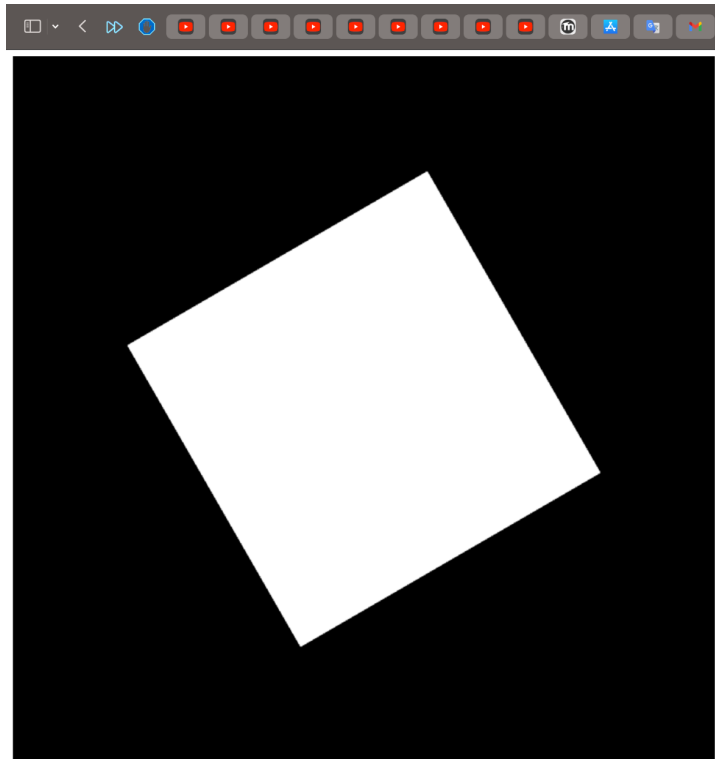
Objective: Utilize ChatGPT to calculate the ModelView matrix for a cube.

Method:

- I pasted the text from transformation-prompt.txt into ChatGPT.
- Ensured the response was in the required Float32Array format.
- Integrated the response into the getChatGPTModelViewMatrix() method in utils.js.

Outcome:

- It looks like gpt did not perform well in the calculation of the model view matrix. It looks like it just rotates the square.



- Chatgpt link: <https://chat.openai.com/share/16544729-5d0e-402d-8d8e-a6b38aec748b>

Task 2: Manual Matrix Calculation

Objective: Independently generate the same transformation matrix as ChatGPT.

Method:

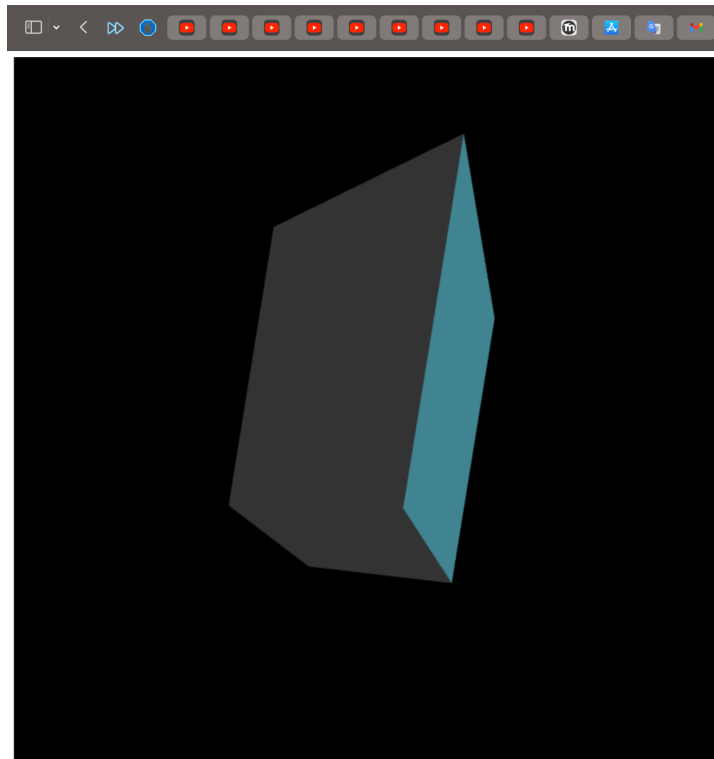
- Modified getModelViewMatrix() in utils.js to manually calculate the matrix. I used rotation, translation and scale methods with values in the

transformation-prompt.txt. I also used the `createIdentityMatrix` method at the beginning to manipulate later with translation, rotation and scale methods.

- When we compare the results of task 1 and task 2, We can see that Chatgpt created wrong results for the model view matrix. When we manually calculated the matrix with methods, we managed to reach the cube shape.

Outcome:

- The differences in the matrices suggest that they represent different transformations. The Task 1 matrix seems to be a simpler, possibly purely rotational transformation, while Task 2's matrix is a more complex transformation involving rotation, scaling, and translation.



Task 3: Animating the Cube

Objective: Animate the cube using the transformation matrix.

Method:

- Consulted ChatGPT for creating an animation sequence.
- Updated `getPeriodicMovement()` in `utils.js` as per ChatGPT's guidance.
- Set the animation to transition over a 10-second period.

Outcome:

- Initially, the cube is in its standard form. For the first 5 seconds, it transitions smoothly, undergoing a series of rotations, scalings, and translations based on the calculated `ModelView` matrix. This part of the animation modifies the cube's size, orientation, and position in 3D space. After reaching the transformed state at the halfway point, the cube reverses these changes over the next 5 seconds, methodically returning to its original size, orientation, and position. By the end of

the loop, it is back in its initial state. This animation loop repeats continuously, creating a dynamic display of the cube's transformation and restoration.

- Chatgpt link: <https://chat.openai.com/share/fd128b00-b60b-48b9-bb79-23addcc7b0e2>