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**Sabancı University CS 405 Computer Graphics Project 3 Report**

The project aims to create a graphical simulation of a basic solar system model. The project involves 3 task. However, only task 1 and task 3 has been successfully completed. Task 2 was not completed.

The first task is to create a scene graph data structure. For this task, the sceneNode.js file needs to be changed. A tree graph data structure and this data structure are comparable. Comparable to a binary tree A parent node, however, may have more than two child nodes. The objects in the scene graph are those that belong to them. The first task requires drawing a MeshDrawer. The tree should be repeated until the children's length is ruined for this. It is necessary to draw the result of a matrix multiplication between the transformed model matrix and the transformed matrix of the child node. Also normal matrix should be multiplied too for transformation.

As I said task two has been skipped. It was not completed.

The task three of the solar system simulation project was to incorporate the planet Mars into our dynamic scene in a seamless manner. Mars was placed in a way that indicated its planetary relationship to the sun by appearing in the scene graph as a child node of the star. We ensured a visually accurate representation of Mars' spherical form by using a "sphere" as the mesh object. Mars was carefully translated by -6 units along the X-axis with respect to the Sun to add even more realism and to set it at the proper orbital distance. For the x, y, and z coordinates, Mars was scaled up by a factor of 0.35. This scaling factor helped to create a visually coherent representation of Mars within the solar system model, while also maintaining the planet's relative size in relation to other celestial bodies. In addition, the planet was configured to revolve around its z-axis in order to replicate Mars' unique rotational behavior. The exact configuration of the rotation was made to be 1.5 times that of the Sun, which gave our virtual solar system's dynamic interactions an extra degree of realism. A high-resolution texture was added to Mars to improve its visual appeal. The chosen image, which can be viewed at the URL provided (https://i.imgur.com/Mwsa16j.jpeg), effectively conveys the distinct surface characteristics and hues of Mars, enhancing the visual appeal of the red planet in our simulation. In addition to adhering to scientific principles, this careful incorporation of Mars into our solar system model improves the overall quality of our simulation and offers users an engaging and educational experience as they discover the wonders of our starry neighborhood.