

Project Abstract

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The Solar System: A Graphical Model**

Background:

Studies have shown that even at the college level, students have minimal accurate knowledge about the solar system. It is vital that this problem be corrected at an early level by teaching elementary school children about our solar system. As the current mechanical models of the solar system are obsolete, I propose to create a model of the solar system using the technology of computer graphics in order to teach students the fundamentals of their solar system. This model will be more or less to scale, and will assist in teaching children the basics they should know about space. It will include only the nine inner planets of the solar system. Extrasolar planets, asteroids, and comets will be omitted so as not to complicate the model. With this model, students will learn the order of the planets in the solar system and will be able to obtain information about each planet's composition, size, moons, and atmosphere if they wish to do so. Most importantly, they will be able to compare the revolution periods, inclinations, and eccentricities of the planet's firsthand as they watch the planets orbiting the Sun.

Description:

At its most basic level, construction of a viable educational model must deal intricately with the solar system itself. Thus, the model must reflect research into the fundamental details of the sun and each of the nine planets. The research incorporated into the model includes such details as the distance of the planets from the Sun, the composition of the planets and their atmospheres, and details about each planet's satellites.

The first basic programming requirement for the model is the knowledge of Processing three dimensional graphics. Without basic knowledge about shapes, lighting, and animation, it is impossible to build this type of computer model.

The next vital requirement for the model is physical accuracy, which is needed in order to correct one of the basic problems with current models. This project utilizes the equations of orbital physics and gravitation in order to simulate the revolutions of all nine planets, thus giving students an unbiased view of the Solar System. Specifically, this addition will allow students to compare two planets in more ways than just size. The orbits of the planets are even inclined to the plane of the Sun, allowing a more complex understanding of the Solar System for those who are interested.

Finally, I have endowed the model with a title page and instructions, as well as

various user interactions, including the ability to shift the camera and change the point of view, as well as the ability to click on a planet to obtain facts about it. These final touches are meant to ensure that the model is viable for educational use and not simply a model that only the creator understands.