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Computer Graphics Mini Project Synopsis

on

"SIMULATION OF MOTIONS OF A SATELLITE AROUND A PLANET"

Submitted in partial fulfillment for the Computer Graphic Laboratory with mini project [15CPL68] course of 6th semester of Bachelor of Engineering in Computer Science & Engineering during the academic year 2018-19.

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"SIMULATION OF MOTIONS OF A SATELLITE AROUND A PLANET"

ABSTRACT

The solar system and its planets have been a mystery since a long time. Most of the people around the globe have many misconceptions about the planets , it's satellites and their motions such as rotation about its axis and revolution around the sun. The motions of satellites around a planet have also been shrouded in a cloud of mystery for many people. A satellite is any object that is orbiting the earth, sun or other massive body. Satellites can be categorized as natural satellites or man-made satellites. The moon, the planets and comets are examples of natural satellites. Accompanying the orbit of natural satellites are a host of satellites launched from earth for purposes of communication, scientific research, weather forecasting, intelligence, etc.

This project aims to simulate the different motions of a satellite around a planet. It also provides top view and bottom view for better understanding of retrograde motion and angled motion along with normal motions of a satellite. This will help the common user to understand the complex science behind satellite motions.

INTRODUCTION

Open Graphics Library (OpenGL) is a cross-language, cross-platform application programming interface (API) for rendering 2D and 3D vector graphics. The API is typically used to interact with a graphics processing unit (GPU), to achieve hardware-accelerated rendering. he OpenGL specification describes an abstract API for drawing 2D and 3D graphics. Although it is possible for the API to be implemented entirely in software, it is designed to be implemented mostly or entirely in hardware. The API is defined as a set of functions which may be called by the client program, alongside a set of named integer constants.

The planetary motions and the motion of satellites are governed by Kepler's laws of planetary motion and Newtons law of gravitation. While Copernicus rightly observed that the planets revolve around the Sun, it was Kepler who correctly defined their orbits and formulated these laws. There have been several misconceptions about these motions starting from people who believe in geocentric model to people who believe that the earth is flat. Some people who believe in heliocentric model don't have a clear picture about it. This project aims to enlighten the user by simulating and allowing them to visualize the motion of a satellite around a planet and helps them to get a better comprehension about satellite motion.

OBJECTIVES

- The model aims to explain people about the planetary motions and satellite motions around a planet.
- Gives a better understanding of the different types of orbits of satellites around a planet.
- Allows the user to view the planets in different angles for better understanding of the revolution of satellites around it.
- Allows the user to understand retrograde and angular motion of a satellite by providing top view and front view.
- Demonstrates basic geometric transformations like rotation, translation and scaling in OpenGL.

SCOPE OF THE PROJECT

Applications include:

- Space simulation programs.
- Simulation of solar system and related motions of planets.
- Space related games.
- Astronomy related demonstrations.
- Demo programs in planetariums.

HARDWARE AND SOFTWARE REQUIREMENT

- Operating System and version: Windows 7 and above /Linux Distributions
- IDE: Code Blocks
- Programming Language: C/C++

Signature of Students **Signature of Guide with Date**

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