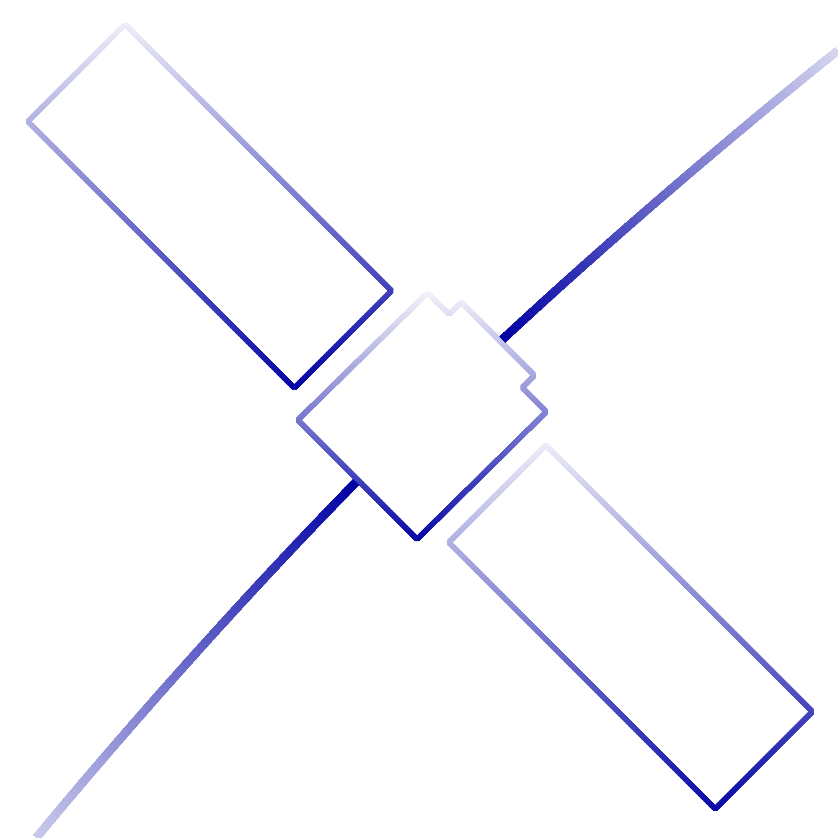


COMPASS

Software Design Document

Embry-Riddle Aeronautical University

Daytona Beach, FL

Requirements

|  |  |
| --- | --- |
| ***No.*** | ***Description*** |
| *1.0* | *The program shall produce accurate renderings of RSO’s.* |
| ***2.0*** | *The program shall provide a pass mode whose purpose is to produce and record accurate photometry data given a satellite’s shape, orbit, and rotation as well as the time of observation and location of the observer.* |
| ***3.0*** | *The program shall provide a manual mode in which the user may define the simulation parameters and see their effects on photometry data.* |
| ***3.1*** | *The user shall define the incoming light direction as well as the RSO shape, initial orientation, angular velocity, and altitude at any given time.* |
| ***4.0*** | *The program shall provide a playback mode in which previously recorded simulation data will be used to render the RSO and live graph.* |
| ***5.0*** | *The program shall provide a reconstruction mode in which the attitude or shape and attitude of the RSO will be generated according to recorded photometry data.* |
| ***6.0*** | *The program shall provide render modes which determine the graphical representation of the RSO during a simulation.* |
| ***6.1*** | *The Photometry render mode shall provide an “up-close” rendering of the RSO for the purpose of generating photometry data.* |
| ***6.2*** | *The OSCOM render mode shall provide a “telescope view” rendering of the RSO for the purpose of simulating the OSCOM system and supporting image processing algorithms within the project.* |
| ***7.0*** | *The program shall provide run modes which determine the speed and accessibility of each simulation.* |
| ***7.1*** | *The Real-Time simulation mode shall render simulations in real-time for the user to observe* |
| ***7.2*** | *The Back-End simulation mode shall render simulations as fast as possible without displaying them to the screen. These renderings are recorded and may be observed in playback mode.* |
| ***8.0*** | *The program shall provide a graphical user interface in which simulations are rendered and photometry data is displayed* |

Architecture

CpsWindow

* Represents the main program window
* Has a GLWidget and a CpsGraph
* - Has a CpsSimulation

CpsSimulation

* Represents a set of simulation parameters

CpsGraph

* Live-Graph Widget
* Graphs brightness in real-time

GLWidget

* Handles OpenGL initialization
* Handles Rendering
* Handles GL viewport resize