**Memorandum 3**

**From:** Justin Pajak, Patrick Creaven, Carter Goldman, Raytheon Preternship Team

**To:** Dr. Matthew Morrison, Assistant Teaching Professor, Department of Computer Science and Engineering, University of Notre Dame

**CC:** John Mallinger, Deputy Chief Engineer, Next Gen GPS Ground System, Raytheon Technologies

Below is an overview of what we have done so far with the project, and our plans for the future.

**What were the goals for this week?**

1. Utilize inheritance to make the satellite and ground station classes have a common parent, making it easier to facilitate calculations.
2. Create functions in satellite class and ground station class that allow basic communication between one satellite and one ground station
3. Create an initial graph data structure to house the satellites and ground stations, so that we can represent their relationships to each other

**What was accomplished this week?**

We accomplished all of our code goals for the week and have begun work implementing some of the new features that are described in the “Goals for next week” section, such as parsing satellite data.

Our Project Manager, Ryan, gave overall very positive feedback, stating that our goals for the week were adequately met, and that our overall project plans seem to be challenging, yet doable in the allotted time. Ryan gave some potential issues to watch out for such as how we utilize certain features of our data structures, specifically regarding the graph constructed and the “add\_edge” feature.

With one of the goals for next week centering on data parsing from online sources provided in the initial weeks of the project by Mr. Mallinger, Ryan suggested utilizing the wget linux command to download those files off of the websites.

We also discussed what the user interface for our completed project will end up looking like. We envision our project will utilize a clock to display the changing coordinates of each satellite in a chosen constellation and will allow the user to ask for what the latency will be between two ground stations. This outputted latency data will also be changing over time with the clock.

**Goals for next week**

1. Get satellite data file and figure out how to parse and implement it in our project
2. Write code for the conversion from spherical orbit data to xyz relative to the center of the earth
3. Utilize a clock library in our program in order the display a satellite’s changing location over time, change the position of the satellites in the graph

**Critical dependencies, open problems, or other things to be aware of for next week?**

1. Finding and using the proper equations to convert spherical coordinates to cartesian coordinates based on time
2. Making the process of updating a satellite’s coordinates in the constellation easier. Will involve developing new functions in Graph.h to give greater access to the vertices.

**How many hours were spent on each goal noted above?**

1. Justin Pajak - 8 hours
2. Patrick Creaven - 8 hours
3. Carter Goldman - 8 hours

Very Respectfully,

Justin Pajak

Patrick Creaven

Carter Goldman

Raytheon Preternship Team

University of Notre Dame

Department of Computer Science and Engineering