

Proposal:

The project that I wish to propose is an animation of a star ship flying through space. It will be simplified to be our solar system but as it flies about it become effected by the gravity of nearby planets and other celestial objects like asteroids. I plan to be doing this project entirely in OpenGL as to expand my understanding and experience with the language and to practice making visuals that I can be proud of. I plan to start with creating our solar system starting with the planets revolving around the sun. Expanding onto making either a path for a spaceship to follow or making it possible to be controlled by the player. Perhaps if I make it big enough I can make one of the planets actually viable to visit and create some kind of simple weather patterns that could be occurring on such worlds (maybe one of Saturns moons as those are small and easy to make a particle system of a water guizer.) Then make it account for the gravitational pulls of those planets as well as the presence of the sun. If I have time, I will make set a collision course for the spaceship and try to emulate the ship breaking apart due to gravity or just hitting the sun. I would also love to create a black whole and emulate what it might look like sucking up our solar system. My plan B is to use Unity and just get a working simulation of a star system to work.

Related Work:

<https://medium.com/@keynekassapa13/creating-the-solar-system-opengl-and-c-9d4e4798d759>

https://www.researchgate.net/publication/301223268_3D_SOLAR_SYSTEM_VISUALIZATION_WITH_OpenG_L

https://www.youtube.com/watch?v=MfGfZwQ_qaY

Plan:

The system I will be using is OpenGL and if that does not work well, I will be switching over to Unity or Unreal 2019/2020 versions. I would like to attempt to make the solar system without any packages as I would really like to test myself and see how far I can get before using some efficient thing that someone has created for this specific reason. Only thing I might look for is something to emulate space travel/speed such as warping or lightspeed from scifi shows.

October 5-16: Research/Set up. Start a github repo so can work on another machine if needed. If this proposal does not work, then choose fluid simulation and follow this Timeline. Simplified to:

Research->begin code->simple idea done->add more->clean and finish.

October 19-30: Begin coding. Attempt to get a couple planets revolving around a sun (no gravity and circular orbits for now). See if making a controlled ship is easier then a pre-planned path for a ship to take.

November 2-6: Try to clean up the solar system. Add in colors and perhaps a sky box for added effect. Add in other celestial objects like asteroids or satellites. If still working on previous Task, then move to plan B.

November 9-20: Attempt to add in gravitational pulls of celestial objects. Read up on how to easily run such equations for every object. At least try to get some planets working with gravity and remove those that dont.

November 23- December 4th: Clean and finish what has been made. Try to get something to show/run. If I had to switch to plan B and finish before now. Try to add something from plan A from what I can.

Difficulties/Concerns:

- Size of solar system (accurate? Or simplified.)
- Distance between all solar objects
- Calculating the force of gravity for every object constantly
- Having something like this run at all
- Starting off with something only to have it turn into something else