112 Term Project Proposal

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Astronomy is a topic that is fascinating to many, but only a few are well-versed in it. In addition, light pollution makes it harder and harder for us to see the stars overhead every night – particularly in Pittsburgh, where the only stars you can see are those in the Big Dipper. I plan to make an educational planetarium application that allows people to see the stars in Pittsburgh without having to turn off all the lights or drive an hour out into the mountains to do so.

I plan to use Pygame to draw the app, and PyEphem to get and compute data about stars. The app will have the following features: the ability to see constellations, display star names, click on a star and see information about it, and draw your own constellations. Within drawing your own constellations, you can click on stars to draw lines between them. You can also erase lines you have drawn, undo lines, redo lines, and save an image of your current screen so you can show the constellations you’ve made to others.

In the “normal” mode, you can scroll around in the sky to see all the different stars. I plan to implement many of the most commonly-recognized stars and constellations, as well as all of the planets. I may have to experiment with another astronomy-based library to do so, though based on experience with PyEphem this will not be hard to do. In the app, you can also change the date and time that you’re looking at. While I plan to only implement Pittsburgh as a location, you will have the ability to view the Pittsburgh sky far into the past and future. There will be a “today” button so you can easily return to the current date and time.

My planetarium app uses PyEphem to fetch and unpack data from star databases/its own database, and I have written a mathematical function that maps the azimuth/altitude of celestial objects, given by PyEphem’s calculations, from spherical coordinates into Cartesian xy plane coordinates. This allows for any sky object to be mapped to a 2D space, allowing me to create the app’s image in 2D instead of 3D.

Pygame: http://www.pygame.org/

PyEphem: http://rhodesmill.org/pyephem/index.html