HW2: Refined Visualization Critique

The visualization example that I used previously is called “NASA’s Eyes on Asteroids”. This visualization is an interactive tool created by NASA, that allows users to explore the asteroid belt and see real-time positions of asteroids in our solar system. The interface is a 3D model of the solar system that can show real-time data on asteroid positions and trajectories. Fig. 1 shows a static image of the interactive tool that NASA provides in its website.

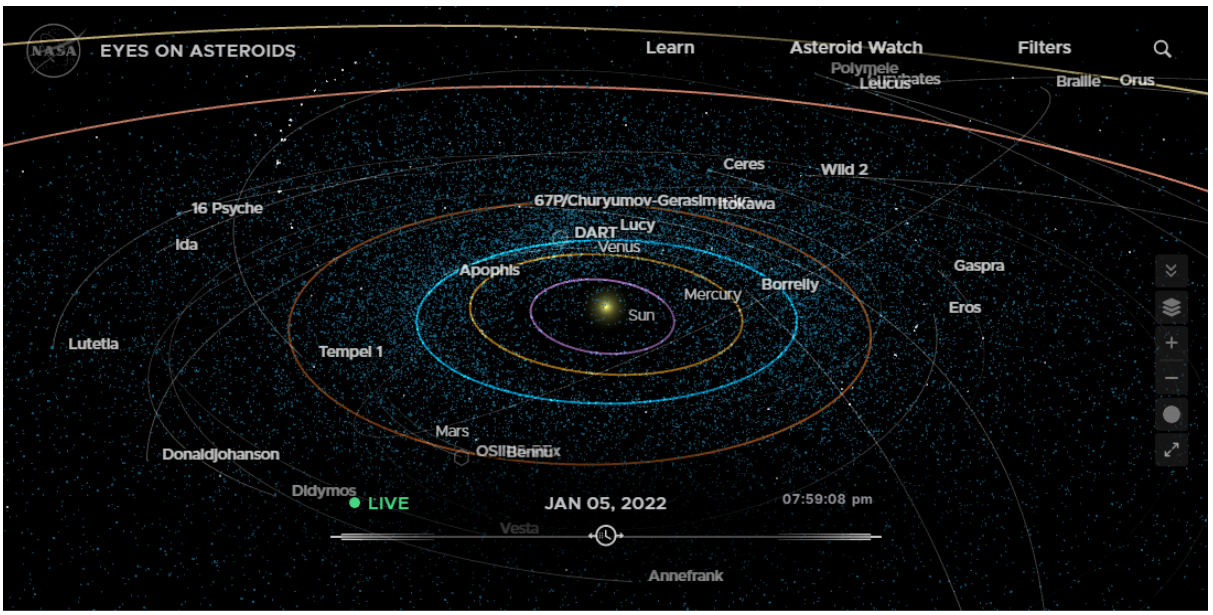

Fig. 1: NASA’s Eyes on Asteroids

Image source: https://eyes.nasa.gov/apps/asteroids/#/asteroids

The "NASA's Eyes on Asteroids" visualization from NASA provides a comprehensive schema of our solar system's asteroids and their orbits.

- It features a continuous attribute for orbital paths, showcasing the elliptical trajectories of various asteroids, comets, and spacecraft around the Sun, which is an interval type attribute due to its measurable scale.
- The celestial bodies, such as planets and asteroids, are denoted by discrete nominal attributes, as their names serve as unique identifiers without implying any hierarchical order. It is a nominal type attribute.
- Each body is positioned along its orbit, marking its current location in space, a continuous attribute of an interval type that can be precisely measured from a zero point.
- The visualization includes a temporal component, displayed as a continuous and ordinal attribute, indicating the date and time for which the positions are accurate, thereby sequencing the data in a chronological order.

The visualization used colors but the colors chosen have no intrinsic ordering. Since the planetary objects in the Solar System are centered around the Sun, a perceptually uniform color coding could have been used to denote the Glyphs for each object. Since the objects move around the sun with time, having a color coded Glyph based on the position of the object would make it easier to understand where the object is, given the position of the Sun. However, the data to color mapping is missing in the current visualization example.

If I were to use this visualization tool I would use proper Glyphs. I would incorporate the following properties into them:

1. Color code the Glyphs in a perceptually uniform manner based on their position w.r.t the Sun.
2. Vary the size of the Glyphs based on the actual size of the objects.
3. Additionally, use something like filling up Glyphs based on their threat level. If an asteroid poses a major threat it would be filled up.

This would allow the users to understand the threat level as well as the position and size of the asteroids specifically (there are other objects but the main aim is to understand what asteroids are potentially a risk to the planet). Currently, the users have to click on each asteroid and read about them to know these details.

I would hold on to the critiques I made regarding this visualization in the previous assignment. In fact, two of the Cons I had previously pointed out, were:

1. Furthermore the different celestial objects such as planets, asteroids and comets are shown by different symbols. However, there is no legend that denotes what these symbols stand for. Users who have no knowledge regarding the names of the different celestial objects could have a hard time differentiating between them.
2. Without proper context or guidance, users might misinterpret the data, such as overestimating the risk of certain asteroids.

The changes mentioned previously that I would want to introduce into the visualization with the Glyphs and Color only corroborate the above critiques.