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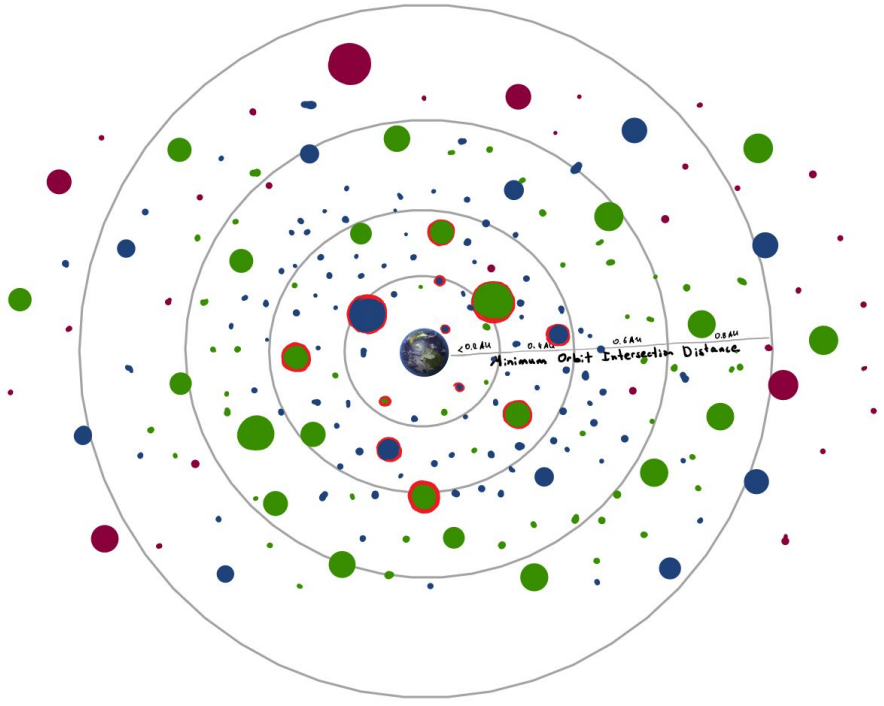
Asteroid Hazard Potential Visualization

Our visualization is concerned with the potential hazardness of near-Earth asteroids. The data was collected by NASA's Near Earth Object Program at the Jet Propulsion Laboratory (California Institute of Technology) (https://www.kaggle.com/nasa/asteroid-impacts/data). The dataset is complete and thorough, but we will need to trim down the number of data points without obscuring the data, as well as filter the data to consider only asteroids within 0.07 AU (Astronomical Unit - the distance between the Earth and the Sun) minimum orbit intersection distance away from the Earth. Minimum orbit intersection distance (MOID) is the distance between the closest points of the osculating orbits of two bodies. It is used by astronomers to assess potential close approaches and collision risks. Asteroids at this distance away from the Earth are close enough to be dangerous and should be considered as a potential threat. We want to examine the relationship between MOID (a ratio value), asteroid absolute magnitude (a ratio value), and asteroid classification (a categorical value) to an asteroid's potential to be hazardous. Asteroid absolute magnitude is defined as the visual magnitude an observer would record if the asteroid were placed 1 AU away, and 1 AU from the Sun and at a zero phase angle.

Our visualization will have a circle representing Earth at its center. The asteroids will also be represented using circles. The three different asteroid types (Apollo, Aten, Amor) will be represented with three different fill colors. Circles representing hazardous asteroids will have an additional color encoding, for example a red border, to differentiate from non-hazardous asteroids. The circles representing the asteroids will be placed relative to the circle representing the Earth according to their minimum orbit intersection distance away from the Earth: the smaller the minimum orbit intersection distance, the closer the asteroid/circle will be to Earth on the visualization.



Sketch of Visualization