### Hashtags: #spacetech, #spaceadventure

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### Tags: Data Visualization

Develop an application that displays the positions of missions currently in space. These would include projects orbiting the Earth, like INTEGRAL, XMM, Envisat, and International Space Station. They could also include missions around other planets (Mars Express, Venus Express), missions observing the Sun, like SOHO, missions travelling to asteroids, like Rosetta, or further away from the solar system, like Voyager. Missions still on orbit but non-operational can be included for completeness.

Currently some programs allow you to monitor which spacecraft is flying over your location at any given moment, but nothing provides a view from the outside: a picture of Earth and all of the planets in the solar system with our spacecrafts interspersed throughout.

A basic approach would result in developing an application that would compute the positions of these spacecraft on a given moment of time, and build a zoomable image displaying them. An advanced result would consist on building an application to generate an animation showing the evolution of orbits of these spacecraft on a selected lapse of time. This project could include information on missions from the various space agencies, European Space Agency, Japanese Aerospace Exploration Agency, and NASA, to name a few.

**Background**

Some knowledge of astronomy and orbit calculations would be helpful to programmers. Information on spacecraft orbit is necessary. Sources for all information is publically available.

**Solution Ideas**

Here are some ways for you to frame this solution:

Consider developing an application that allows the user to query the positions of a range of spacecraft on a given moment of time, and build a zoomable image displaying their orbits and positions at the requested time;

An advanced result may consist of building an animation showing the orbits of these spacecraft on a selected lapse of time; and/or

Any intermediate approach between these two options could be possible as well.

**Sample Resources**

* <http://en.wikipedia.org/wiki/Two-line_element_set>
* [http://www.amsat.org/amsat/keps/kepmodel.html](http://www.amsat.org/amsat/keps/kepmodel.html%20)
* <http://nssdc.gsfc.nasa.gov/planetary/>
* <http://nssdc.gsfc.nasa.gov/image/>
* <http://astro.unl.edu/naap/pos/animations/kepler.html>
* <http://eyes.nasa.gov/>