ANT61 hackathon October 2025

Context

AN61 Beacon is a satellite hardware that allows the owner of the satellite maintain constant communication between their office on Earth and their satellite in orbit.

This novel communication technology allows operator of the satellites (typically a satellite owner or a company that is directed by the owner of the satellite) to react to dangerous situations in orbit in real-time, often saving the satellite missions.

There are two main external threats to a satellite in orbit:
1. Coming close to a piece of space debris or an asteroid, so called Conjunction events (in the extreme case these result in collisions, that destroy a satellite and produce thousands of new debris pieces in orbit)

2. Being hit by a CME, Coronal Mass Ejection, in other words a very dense stream of particles emitted by the Sun – this usually results in the destruction of on-board electronics, rendering satellite inoperable, and turning it into big chunk of space debris

Challenge

You need to build a system where an operator could input multiple satellites, each specified by their orbital parameters, and receive real-time notifications of potential dangerous situations in the near future with suggested actions to take in orbit to minimise the damage to the satellite.

As part of this challenge, you will need to find and use use real space situational data on the conjunctions and space weather conditions data sources and come up with a way to visualise the dangerous events as well as the decision making part of the application, where the operator can see the suggested action, and execute it.