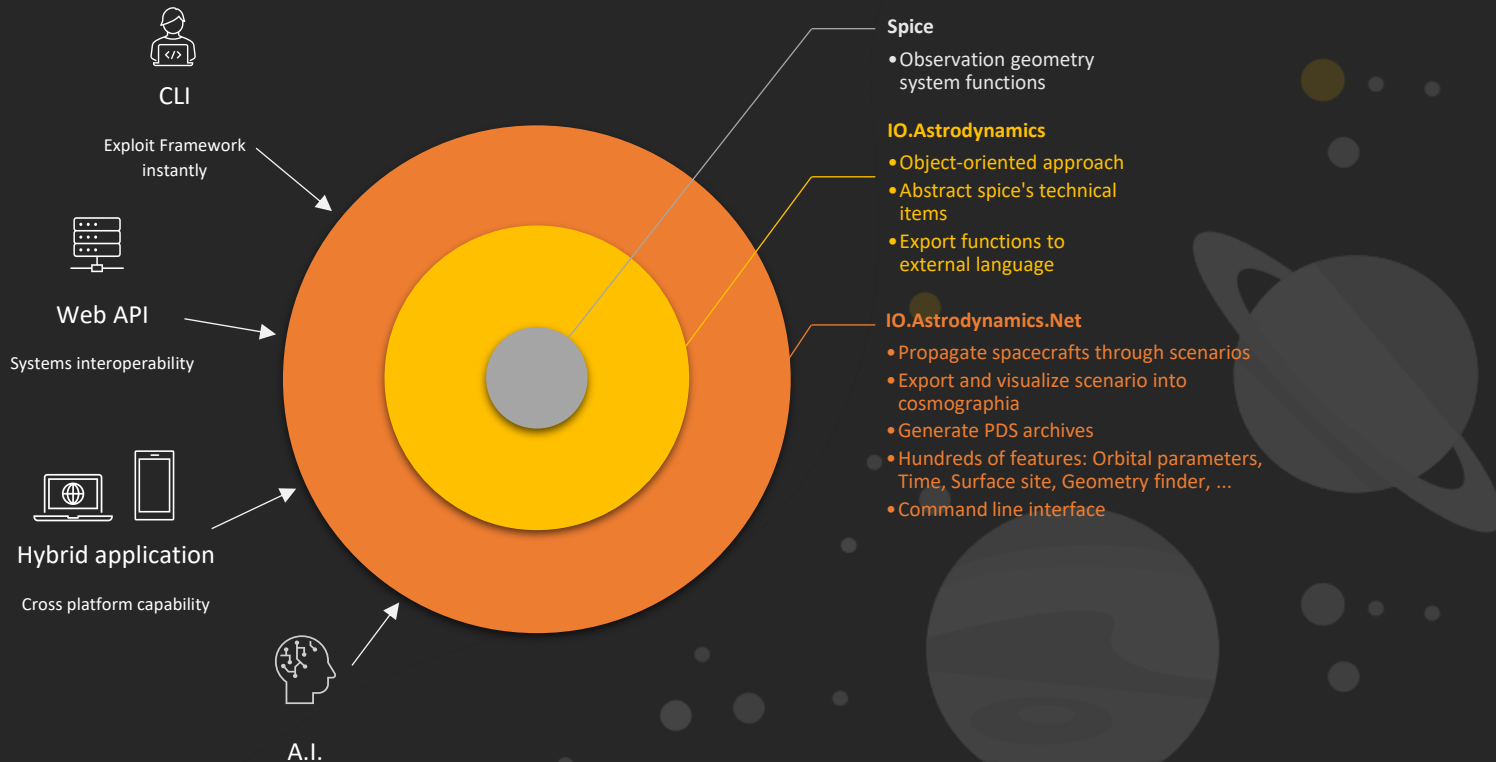# Project presentation

IO.Astrodynamics is an open-source initiative aimed at enhancing the functionality of the Spice library. The primary goal is to empower developers and researchers in the field of astronomy and astrodynamics by abstracting the technical complexities, enabling them to focus on their core objectives.

This project extends Spice's capabilities by offering an object-oriented approach, hundreds of extension methods and a propagator that includes essential features such as n-body perturbations, simplified atmospheric models, solar radiation pressure consideration, and a precise gravitational model based on geopotentials. Furthermore, users can easily execute impulsive maneuvers on spacecraft, facilitating mission planning and analysis.

Project structure

CLI

Exploit Framework instantly

Web API

Systems interoperability

Hybrid application

Cross platform capability

A.I.

Spice
- Observation geometry system functions

IO.Astrodynamics
- Object-oriented approach
- Abstract spice's technical items
- Export functions to external language

IO.Astrodynamics.Net
- Propagate spacecrafts through scenarios
- Export and visualize scenario into cosmographia
- Generate PDS archives
- Hundreds of features: Orbital parameters, Time, Surface site, Geometry finder, ...
- Command line interface

Useful links

Projects
https://github.com/IO-Aerospace-software-engineering/Astrodynamics
https://github.com/IO-Aerospace-software-engineering/Astrodynamics.Net

Docs
https://github.com/IO-Aerospace-software-engineering/Astrodynamics/wiki
https://github.com/IO-Aerospace-software-engineering/Astrodynamics.Net/wiki

Features
https://github.com/IO-Aerospace-software-engineering/Astrodynamics/wiki/Features
https://github.com/IO-Aerospace-software-engineering/Astrodynamics.Net/wiki/Features

Contact
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Collaborate

Join us in advancing the accessibility and usability of astrodynamics and astronomy observation simulations through collaborative open-source development.