

Orbital lifetime estimation for space debris

Code: 19/30

Company: GMV Innovating Solutions

Location: GMV, HQ Building, Thomson Avenue, Harwell Campus, OX11 0GD

Company Description:

GMV is a privately owned technological business group with an international presence. Founded in 1984, GMV offers its solutions, services and products in very diverse sectors: Aeronautics, Banking and Finances, Space, Defense, Health, Cybersecurity, Intelligent Transportation Systems, Automotive, Telecommunications, and Information Technology for Public Administration and large corporations.

In the global world we live in, the individual and complex needs of our clients are usually met with technological products, solutions and services that are constantly evolving and that were not originally designed with the clients' specific needs in mind, but rather to cater to the common denominator in a global market.

The leadership position that GMV has attained in these sectors is based on an in-depth knowledge of client needs, which allows us to deliver solutions specifically tailored to their individual requirements. GMV offers clients the best solution, fully adapted to their own requirements and including all the support necessary to achieve optimum results at a suitable price. At GMV, our employees, operating model and cultural values focus on meeting the very needs of each individual client.

Project Description:

The proposed project consists in developing a tool "Orblife" to compute the orbital life for the non-operational satellites and space debris object in order to be able to monitor their decay and estimate an epoch of re-entry. Using Orekit library, which already implements DSST propagator, following tasks are considered:

- Load a historical dataset of orbital information for the space objects, e.g. TLEs.
- Process for each object the historical orbital information fitting the DSST forces model including drag effects in order to characterise the object behaviour and obtain a ballistic coefficient based on the selected model.
- Perform a long-term propagation up to re-entry altitude and estimate the re-entry epoch for each object.
- Perform a sensitivity analysis on the re-entry epoch with respect the ballistic coefficient.

Applicant Specification:

The candidate will work in the UK offices of GMV, in particular in the Flight Dynamics and Operations business unit, He/She will be supervised and supported by a 12 years experienced project manager and it is expected he/she will acquire and improve the following skills during the project.

- Good knowledge on space weather characteristics in particular solar activity evolution.
- Good knowledge on orbital dynamics, particularly in long-term propagation and force models effect on the satellite orbits.
- JAVA code language and frameworks, eclipse, maven, coding rules, automatic testing....
- Orekit astrodynamics library and Hipparchus mathematical library.
- GMVs focussuite infrastructure.
- Additionally he/she will have the opportunity to improve his/her technical expression, writing and presenting the results to the whole of the business unit

Minimum Requirements:

- Msc. Aerospace Engineer studies
- Good mathematics and physics background.
- Basic knowledge in Orbital dynamics
- Basic knowledge computational coding (any language, preferably object-oriented)

Further details:

8 weeks minimum fixed term contract to be agreed with successful candidate but nominally with a start date around 17th June, 2019 to attend the SPIN Induction day at the Satellite Applications Catapult, and completion before 20th September for the Showcase the following week. Salary is £1,300- £1,500 (depending on education) per calendar month gross.

Closing Date for Applications: 5pm on Monday 29 April 2019

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.