

Influence of Satellite Mass Property Variation on Dynamics & Control

Code: 21/26

Company: Astroscale Ltd

Location: Harwell Campus, Oxfordshire

Company Description:

Astroscale is the first private company with a mission to secure long-term spaceflight safety and orbital sustainability for the benefit of future generations. Founded in 2013, Astroscale is developing innovative and scalable solutions for satellite end-of-life and active debris removal services in order to mitigate the growing and hazardous build-up of debris in space. Headquartered in Japan with offices in the UK, Singapore, Israel and the US, Astroscale is a rapidly expanding venture company, preparing to solve a growing environmental concern.

Astroscale launched its second mission, ELSA-d, a technology demonstration for end-of-life services and pursuing complementary missions with potential customers in March 2021.

Project Description:

The purpose of this project is to carry out research/modelling activities to assess the influence of variations in spacecraft mass properties from various causes.

On the servicer spacecraft, this includes but is not limited to:

- An assessment of the impact of fuel sloshing on the global moments of inertia matrix. This would initially involve a literature review followed by modelling work in an aerospace simulation package to assess the impact on Astroscale spacecraft.
- An assessment of the impact of non-rigidity on the global moments of inertia matrix. This would initially involve a literature review and discussions with the Astroscale structural analysis team followed by modelling work as above.

On the client spacecraft:

- An assessment of the accuracy of MOI estimation of inert client spacecraft with different sensor technologies.

Following the above activities, a technical report and presentation will be required, showing the results of the analysis/modelling work performed and conclusions drawn.

Applicant Specification:

Must be between penultimate and final year of Aerospace / Aeronautical Engineering degree (BEng or MEng).

Minimum Requirements:

The intern should have a reasonable knowledge or significant interest of space and the satellite industry, as well as demonstrable quantitative analytic skills; Other requirements include:

- Experience with the use of aerospace simulation programming language such as Python or Matlab.
- Strong grasp of mathematics relevant to aerospace engineering such as rotational dynamics (Euler's equation), basic calculus and matrix operations.
- Knowledge of control engineering theory as applied to aircraft or spacecraft.
- Must be capable of working with autonomy and initiative.
- Track record of quality / on time delivery.
- Good communication skills (written and verbal) on technical subjects.
- Working knowledge of MS Office tools (Excel, Word, PowerPoint etc.)

Preferred Additional Requirements:

- Experience with control engineering design for aircraft or spacecraft.
- Interest in satellite control system design
- Experience with using Simulink
- Understanding of the global space and satellite industry
- Interested in space sustainability and space debris
- Experience in report writing

Further details:

8 weeks minimum fixed term contract to be agreed with successful candidate. Virtual Induction Event to be held on 21 June 2021. Ideally to complete before the start of the next academic year. Salary is £1,500 per calendar month gross.

Closing Date for Applications: 5pm Monday 17 May 2021

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.