

Autonomous Flight Termination Systems for Micro-Launchers

Company: Deimos Space UK Ltd.

Location: Harwell, Oxfordshire

Code: 18/56

Company Description:

Deimos Space UK performs both upstream (engineering design) and downstream (applications) activities in the space industry. Deimos has extensive experience in aerospace activities; we are involved in the majority of European Space Agency programmes, including science, exploration, Earth observation, satellite navigation, launchers and human space flight.

The Flight Systems department performs a variety of mathematical modelling and systems analyses relating to the design of space vehicles from interplanetary spacecraft such as ExoMars to detailed debris analysis for re-entry events. We are a key member of one of the teams in the UK launch programme, being responsible for trajectory modelling and safety analysis for Orbex.

Outside of launch, the department has particular expertise in the atmospheric phases of spaceflight and trajectory optimization. Recent activities have included: research into satellite design approaches to enhance break-up during end-of-life re-entry to minimise risk to the population; development of a hardware-in-the-loop simulation of the ExoMars 2020 Martian landing; Mission Analysis activities for launch, transfer and communications, as well as support to systems engineering for a space weather mission to the Sun-Earth L1 and L5 points.

Project Description:

There are a number of areas where an intern could support this work – the exact task will depend on the person selected and the timing, but activities could include:

- Supporting requirements analysis e.g. consultation with legislators and Launch Service Providers
- Research sensors (GNSS receivers and inertial measurement units) and processors which could be used (performance, cost, mass, reliability)
- Research different Autonomous Flight Termination Systems used around the world, e.g. those recently developed in the US for Falcon 9.
- Supporting the analysis and trade-off of alternative unit architectures
- Implement some realistic AFTS algorithms in our Functional Engineering Simulator to determine the performance that can be achieved.
- Run some trajectory simulations in our mission analysis tools to demonstrate the benefits that AFTS can bring.

The intern would be expected to produce a technical note describing the activities undertaken and support project review meetings.

Applicant Specification:

Minimum Requirements:

Looking for a recent graduate or postgraduate student with a degree in engineering, physics or a related discipline with a strong academic background in some or all of the following areas: dynamics, computer simulation and modelling of physical systems, electronics systems.

Preferred Additional Requirements:

The project could be tailored to a variety of students but a high level of programming competence is desirable, experience with Matlab would be beneficial, as would an understanding of systems engineering.

Further details:

Fixed term contract to be agreed with successful candidate, 8 weeks minimum, up to maximum 6 months – exact length of time to be agreed with candidate. Start date around 02 Jan 2019 (cannot be significantly later due to the requirement of the SPIN scheme that the 8 weeks funded by SPIN must be completed at latest by 28 Feb 2019). Salary is £1,500 per calendar month.

Closing Date for Applications: 5pm on the 28 November, 2018

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.