

Characterisation of piezo electric rotary motors for space deployable structure

Code: 20/53

Company: Oxford Space Systems

Location: Harwell, Oxfordshire

Company Description:

Oxford Space Systems (OSS) is an award winning, space technology business that's pioneering the development of a new generation of deployable antennas and structures. OSS is set on becoming the leading global supplier of innovative deployable structures in the new space age.

Contracts and collaborations are under way with leading satellite builders in Europe as well as emerging players in the microsat & nanosat markets in the US, Europe and Asia. The quickly growing Oxford Space Systems team contains a diverse range of world-class expertise in the fields of RF engineering, aerospace, mechanical, electrical/electronic, and thermal engineering for the space environment.

Oxford Space Systems currently works in three principal areas of product development: deployable antennas, AstroTube™ composite boom systems and deployable panel systems. Combining proprietary with traditional materials, together with an agile 'can do' approach means OSS is delivering innovative, scalable structures that save significantly in both build & launch costs.

Based at the UK's Harwell Space Cluster, OSS has excellent access to the expertise & facilities of RAL Space, the European Space Agency, the Science & Technology Facilities Council and the Satellite Applications Catapult. OSS is backed by significant private equity and enjoys the funding support of Innovate UK, the European Space Agency and the UK Space Agency.

You can find more information about our company at www.oxford.space

Project Description:

We are currently looking to expand our team at OSS by hiring an intern. The project involves the generation of analytical models, characterisation, and partial space qualification of piezo electric rotary actuators. Use: As deployment actuators for all antenna systems /booms requiring motorisation in favour of DC motors

Advantages: High torque, low speed, high detent torque, can also be very compact compared to equivalent DC motor units. **Disadvantages:**

high voltage, high frequency electric pulses, similarly to steppers they require control electronics.

Outcome: Suitability and characterisation of 2 to 3 different types of piezo electric motors for deployable antennas (primarily) and other deployment systems for space applications. Development of analytical models to predict piezo electric behaviour. Development and execution of a test plan.

Partial space qualification of piezo electric rotary actuators. Duration: Six months
Suitable candidate: Final year Mechatronic Engineering student

Applicant Specification:

The proposed project will enable our student-intern to develop new research, design and understanding required for the partial space characterisation of motorised actuators, with a view to using this type of electro-mechanical devices in deployable structures for space applications.

This will include first-hand industry experience using CAD, analysis tools, creation of manufacturing drawings, procurement of parts and components, devising and executing test plans and technical-report writing. In addition, the intern will gain the experience of working within teams in a professional environment.

The intern will also gain an understanding of the development process for space hardware, the lifetime of a space project, quality and qualification requirements along with best practices for the space industry.

This is a great opportunity for the intern to be part of real-life space hardware design and develop mechanical engineering research skills. The intern will be responsible for liaising directly with the CTO and R&D team, to gain an understanding of the scope of the project, how key deadlines and objectives will be met, and ensuring the project runs smoothly to conclusion.

Minimum Requirements:

- The student-intern is expected to be a final year Mechatronic Engineering student
- Should possess an understanding of modelling of electro-mechanical systems
- Experienced user in programming (Matlab/Simulink or Scilab)
- Basic use of CAD systems
- Pragmatic problem solving
- Hands-on skills
- Pro-active
- Interested in Space Technology
- Team player
- Able and willing to following instructions from time to time
- Experience with Microsoft Office

The student-intern is not expected to have all the answers but should possess the skills necessary to succeed in a dynamic, fast-paced New Space manufacturing company.

Preferred Additional Requirements:

- Some familiarity with generation of manufacturing drawings
- Previous experience in creation and execution of test plans

Further details:

OSS would like the student-intern to be placed for 6 months. OSS proposes to pay the UK national minimum wage rate throughout the entire internship. Proposed start date is Monday 7th September 2020, conditional upon CoVid restrictions in place at that time, as the work needs to be carried out at our site in Harwell safely. Interns also need to have the right to work in the UK.

Closing Date for Applications: 5pm Monday 13 July

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.