

Crover – The first robot able to ‘swim’ through bulk solids

Code: 20/16

Company: Crover Ltd

Location: Royal Observatory, Blackford Hill, Edinburgh, EH9 3HJ

Company Description:

Crover is centered around the commercialisation of the first ever technology for locomotion in bulk solids (e.g. sand, grains, powders).

Crover's first product is a remote probing device for the monitoring of cereal grains stored in bulk (e.g. in sheds or silos). This helps grain-storekeepers identify critical conditions early and maintain the quality of their stock. #SavingGrains

Project Description:

Grain storage sites are generally located in rural areas, with grain storage units such as sheds and silos often not being connected through standard data-transfer networks such as WiFi and LTE. In order for the Crover grain monitoring system to be deployable in grain storage sites, regardless of location, and without the need for expensive electrical installation projects, we are currently working, with the support from ESA BIC UK, on the implementation of a low-altitude satellite data transfer system. This will enable the Crover data to be sent, through a local gateway, to a centralised server, as well as small control messages being sent back to the Crover robot where required.

Initial work has already been carried out and a basic data transfer system set up. The intern will be tasked with collaborating on testing and improving such system, and will be in charge of setting up the back-end and database for the Crover data, enabling the data to be stored, analysed and displayed for the customers.

This will require assessing the specific data requirements of the Crover robot, together with the implementation of appropriate algorithms.

Main duties and responsibilities:

- Collaborate on the development of the first robotic device for the monitoring of cereal grains stored in bulk (e.g. wheat/barley in sheds/silos)
- Implementation and testing of satellite-data-transfer system for duplex connectivity
- Setting up of Crover back-end system
- Design and optimisation of database system
- Compile technical reports and documentation for both internal and external use

Applicant Specification:

We are looking for a student to join one of the most exciting opportunities in Scotland and to work with our growing team on the development of the satellite data-transfer and back-end system for the first drone able to move through dense granular media.

It is expected that through the placement, the student will acquire very unique knowledge of the inner workings of the Crover robot, including:

- the novel physical phenomenon for locomotion in bulks solids on which it is based;
- the satellite data-transfer system
- machine learning
- the Robot Operating System (ROS)

The student will be stimulated to take a leading role within their area of product development.

It is expected that, by the end of the project, the student will be fully integrated into the Crover team and prepared to embark on a successful career. Prospectuses for a future career path, whether in continuation of the role with the Company (in the case of exceptional interns), or in a more general academic or industrial setting, will be discussed with the student before the end of the project.

Minimum Requirements:

- Pursuing or achieved University-level undergraduate or postgraduate degree in one of: Computer Science, Astronomy, Mathematics, Physics, Robotics, Engineering or similar
- Critical thinking and ability to work within a team
- Programming skills (preferably in Python and/or C++)
- Experience setting up a back-end and database

Preferred Additional Requirements:

- Experience with robotics (using ROS or similar)
- Knowledge of low-altitude satellite IoT data transfer systems

Further details:

8 weeks fixed term contract to be agreed with successful candidate but nominally with a start date around 15 June 2020 to attend the SPIN Induction day at the Satellite Applications Catapult, and completion before Mid-September for the Showcase the following week. Gross salary is £2,400 for the entire internship's duration (8 weeks at £300 per calendar week).

Closing Date for Applications: 5pm Tuesday 14 April

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.