

# Modular Scientific Drone Design

Funded masters bursary in the Electrical Engineering Department at the University of Cape Town

## Project Summary

The Linked data And Networked DRoNeS ([landrs.org](http://landrs.org)) project is building standards based dynamic tooling for the automation of scientific drone data capture. Scientists across almost all domains are now using small drones as a standard sensor platform to capture data that is otherwise unavailable. A common challenge encountered by most scientists is that off the shelf commercial drone platforms do not meet their scientific needs, however, building (and legally flying) a custom built drone requires both an engineer and notable effort in passing appropriate but onerous regulatory steps. This project requires a student to design, build, and qualify a professional grade hexacopter (around the open source autopilot Pixhawk Cube). Key factors in this design will include: (1) Modularity to enable flexibility in configuration for various payload and flight requirements, (2) Design of a custom and flexible 'Science Instrument Mount' to support mounting a range of common scientific instruments, (3) Excellent documentation on build and use of the platform, (4) Integration with the LANDRS toolkit. The resulting design will be published and licensed under free to use open source licenses.

## Candidate Requirements

- Bsc(Eng) Mechatronics, or Electrical Computer Engineering
- Available for full time study
- Available to start immediately
- No citizenship requirements but must be in Cape Town South Africa for the next 18months on a valid work or study visa (or a South African citizen)

### Technical skills

- Mechanical Design skills
  - CAD
  - Experience with 3D printing, CNC machining an advantage
  - Enjoys and capable working with their hands
- Electrical Design skills
  - Familiar with low voltage electronics assembly and basic circuit design. No PCB or analog circuit expertise needed.
  - Familiar with standard wiring harness and connectors options for drones would be an advantage
- Software skills
  - Python, Linux, and Git experience essential. Include any public git repos you have in your application.
  - Experience with Embedded Systems, and C will be an advantage but not essential if you have the above.
- 'Soft' skills:
  - System design
  - Ability to make clear documentation

- Willingness to collaborate with international teams
- Good spoken and written English

## Remuneration

- Full university fees will be paid for 2 years (renewed annually on satisfactory performance)
- A monthly stipend is included, offer will depend on candidate qualifications, starting at ZAR 180 000/year

## Application

Send a 2pg CV, Undergrad transcript and Cover letter to [jane.wyngaard@uct.ac.za](mailto:jane.wyngaard@uct.ac.za) by 16 April 2021. If a suitable candidate is found prior to this date further applications will not be considered.