

**Research Engineer/Fellow (Spacecraft) - GR3**  
**Singapore Institute of Technology**

Direct Link: <https://www.AcademicKeys.com/r?job=241859>

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Posted Jul. 23, 2024, set to expire Jul. 5, 2025

**Job Title** Research Engineer/Fellow (Spacecraft) - GR3  
**Department** Engineering  
**Institution** Singapore Institute of Technology  
Singapore, , Singapore

**Date Posted** Jul. 23, 2024

**Application Deadline** Open until filled

**Position Start Date** Available immediately

**Job Categories** Research Scientist/Associate

**Academic Field(s)** Mechanical Engineering  
Electrical and/or Electronics  
Computer Engineering  
Computer Science  
Aerospace/Aeronautical/Astronautics  
Engineering - Other

**Job Website** <https://careers.singaporetech.edu.sg/cw/en/job/498732/research-engineerfellow-spacecraft-gr3>

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**Job Description**

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**Job no:** 498732

**Department:** Engineering

**Contract type:** Contract

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As a University of Applied Learning, SIT works closely with industry in our research pursuits. Our research staff will have the opportunity to be equipped with applied research skill sets that are relevant to industry demands while working on research projects in SIT.

The primary responsibility of this role is to deliver on an industry innovation research project where you will be part of the research team to develop integrated control algorithms for autonomous cubesatellite formation flying. The controllers that will be developed during this project will differ from previous work on this topic by merging guidance laws never applied before to spacecraft formation flying while embedding collision avoidance capacities into a single control strategy. In general terms, the proposed control approaches will force the dynamical performance of one or several followers, with respect to a leader, to asymptotically track a time-varying nominal trajectory, while the threat of collisions between formation members is eliminated by means of repelling accelerations generated by a collision avoidance scheme. The controllers will also be designed to account for and mitigate the orbital perturbation effects due to  $J_2$  and atmospheric drag. To critically evaluate and validate the design of the controllers, test cases based on the physical and orbital features of existing or planned cubesatellite formation flying missions will be implemented, while also increasing the number of elements in the formation when considering scenarios such as reconfigurations and position switching in low-Earth elliptical reference orbits. The final stage of this project will further validate the work done by embedding the control algorithms into an orbital control system which is integrated with a cubesat propulsion system. Currently there are no OCS integrated with a propulsion system that can natively perform autonomous orbital operations.

### Key Responsibilities

- Participate in and manage the research project with Principal Investigator (PI), Co-PI and the research team members to ensure all project deliverables are met.
- Undertake these responsibilities in the project:
  - i. Develop, test and deploy spacecraft simulations and practical solutions to meet the project's technical objectives
  - ii. Write up research findings for publication in leading discipline specific journals
  - iii. Use creativity to analyse and interpret research data and draw conclusions on the

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outcomes.

- iv. Continually update knowledge and understanding in field of specialism.
- v. Attend and contribute to relevant project meetings.
- vi. Contribute to collaborative decision making with colleagues in areas of research.
- vii. Plan and manage own research activity in collaboration with others.
- viii. Communicate material of both a non-technical and specialist nature to a broad audience using a range of media.

- Carry out Risk Assessment, and ensure compliance with Work, Safety and Health Regulations.
- Coordinate procurement and liaison with vendors/suppliers.
- Work independently, as well as within a team, to ensure proper operation and maintenance of equipment.

### Job Requirements

- Have relevant competence in the areas of science and engineering
- Have a degree in STEM discipline. Possessing a Master's or PhD degree will be advantageous.
- Knowledge of control engineering, autonomous systems, orbital mechanics, programming, spacecraft engineering and specialist software tools will be advantageous
- Experience of system integration and hardware in the loop simulation are desirable

### Key Competencies

- Specialist knowledge relevant to the broad discipline of spacecraft attitude and orbit control.
- High competence in computer coding in Matlab, Python, C or similar
- Experience of using Satellite Tool Kit software (desirable)
- Excellent communication and interpersonal skills
- Excellent time management and organisational skills
- Ability to work independently and as part of a team
- Ability to present in both written and oral publications
- Ability to meet deadlines
- A publication record consistent with career stage (desired)
- Ability to assess and organise resources
- Previous practical experience working with space systems is desirable, however related experience with more general autonomous vehicle systems software and hardware, and simulation of such systems, is acceptable.
- Ability to liaise confidently and effectively with a range of individuals within and external to the

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university.

- Flexible approach to dealing with research problems as they arise
- Willingness to learn and develop
- Possess strong analytical and critical thinking skills
- Show strong initiative and take ownership of work

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**Advertised:** 23 Jul 2024 Singapore Standard Time

**Applications close:** 31 Dec 2024 Singapore Standard Time

### Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

### Contact

Singapore