



## THE POST

<b>College:</b>	<a href="#">College of Engineering, Mathematics and Physical Sciences</a>
<b>Post:</b>	<b>Postdoctoral Research Associate / Postdoctoral Research Fellow</b>
<b>Reference No:</b>	<b>S55826</b>
<b>Grade:</b>	<b>E/F</b>
<b>HERA:</b>	<b>ARF/RFEL</b>
<b>Reporting To:</b>	<b>Dr Halim Alwi</b>

The above full-time fixed-term post is available immediately until 30 November 2019 (with possible 5 months extension) in the College of Engineering, Mathematics and Physical Sciences.

### Job Description

#### Main purpose of the job:

The successful applicants will contribute to Exeter's commitments to the EPSRC funded project CRUISE, in an exciting research area of flight control for small multirotor unmanned aerial vehicles (UAVs) for civil and commercial applications.

The overall *aims* of the project are: (1) to help improve safety, resilience and survivability of small multirotor unmanned aerial vehicles in the event of in-flight faults and failures, and (2) to bridge the gap between theory and application of sliding mode control, thus encouraging adoption of sliding mode control in industry, particularly the aerospace sector. In order to achieve these aims, the main *objectives* of the project are to :

- a) Develop a simulation model and simulation tool for highly redundant multirotor UAV,
- b) Investigate and develop fault tolerant control (FTC) schemes based on sliding mode control, and
- c) Build the hardware of the multirotor UAV, and subsequently to implement, test and evaluate FTC control schemes.

The project will focus on the application of so-called sliding mode methods to address the aims and objectives listed above. The successful applicants will help to build the UAV, implement, tune and evaluate fault tolerant flight control on a multirotor UAV (objective (c)). The successful applicant will also be expected to assist in developing simulation model and tools (objective (a)).

## POSTDOCTORAL RESEARCH ASSOCIATE

### Main duties and accountabilities:

1. To undertake research as appropriate to the field of study including:
  - Writing up research work for publication;
  - Developing research objectives and proposals for own or joint research;
  - Making presentations at national and international conferences and similar events;
  - Dealing with problems which may affect the achievement of research objectives and deadlines;
  - Analysing and interpreting the results of own research and generating original ideas based on outcomes;
  - Using new research techniques and methods;

- Using initiative and creativity to identify areas for research, developing new research methods and extending the research portfolio;
  - Using creativity to analyse and interpret research data and draw conclusions on the outcomes.
2. To contribute to teaching and to be involved in the assessment of student knowledge including assisting in the supervision of student projects and in the development of student research skills.
  3. To work in collaboration with colleagues as appropriate to the field of study including:
    - Contributing to collaborative decision making within the research group;
    - Contributing to the production of collaborative research reports and publications.
    - Preparing papers and presenting information on research progress and outcomes to bodies supervising research, e.g. steering groups.
  4. To communicate complex information, orally, in writing and electronically.
  5. To prepare proposals and applications to external bodies, e.g. for funding and contractual purposes
  6. To contribute to the planning of research projects.
  7. To use research resources, laboratories and workshops as appropriate and to take responsibility for reducing hazards and for the health and safety of others. Where appropriate, will also be responsible for conducting risk assessments.
  8. To monitor research budgets as appropriate.
  9. To engage in continuous professional development and to be responsible for continually updating knowledge and understanding in field of study or specialism and for developing skills.

This job description summarises the main duties and accountabilities of the post and is not comprehensive: the post-holder may be required to undertake other duties of similar level and responsibility. Please visit the Human Resources website to view the Research Fellow role profiles.

**Person Specification - POSTDOCTORAL RESEARCH ASSOCIATE**

<b>Competency</b>	<b>Essential</b>	<b>Desirable</b>
Attainments / Qualifications	PhD (or nearing completion) or equivalent qualification/experience in embedded systems or related field of study.	Experience of software-hardware implementation.  Knowledge and experience of programming in C/C++ or related software.
Skills and Understanding	Sufficient knowledge in the discipline and of research methods and techniques to work within established research programmes.	Evidence of research activity and published research.
Prior Experience	Understanding of health and safety legislation	Experience of undergraduate teaching.
Behavioural Characteristics	<p>Excellent written and verbal communication skills.</p> <p>Able to communicate material of a specialist or highly technical nature.</p> <p>Able to manage research and administrative activities and to balance the competing pressures of research and administrative demands and deadlines.</p> <p>Able to liaise with colleagues and students.</p> <p>Able to build contacts and participate in internal and external networks for the exchange of information and collaboration.</p> <p>Able to identify potential sources of funding.</p> <p>Actively participate as a member of a research team.</p> <p>Engage in continuous professional development.</p> <p>Understand equal opportunity issues as they may impact on areas of research content.</p> <p>Where appropriate to the role, willingness to undergo training in order to conduct risk assessments</p>	
Circumstances or Additional Competencies/ Experience	<p>Experienced in embedded systems and well versed with implementations, tuning and evaluations of control schemes on aerospace or robotic systems, or techniques which can be applied to these areas.</p> <p>Willing to work flexibly to achieve project demands</p>	<p>Experience or knowledge of Pixhawk flight control (or similar microcontrollers) and Ardupilot/Arducopter software is highly desirable.</p> <p>Knowledge of sensors, actuators and signals processing</p> <p>Knowledge of control systems and design techniques.</p> <p>Experience or knowledge of aerospace systems especially in multirotor UAVs.</p> <p>Ability to pilot a multirotor UAV will be an added advantage.</p>

## POSTDOCTORAL RESEARCH FELLOW

### Main duties and accountabilities:

1. To undertake research as appropriate to the field of study. The responsibilities may include all or some of the following:
  - Acting as principal investigator on research projects;
  - Developing research objectives, projects and proposals;
  - Conducting individual or collaborative research projects;
  - Identifying sources of funding and contributing to the process of securing funds;
  - Extending, transforming and applying knowledge acquired from scholarship to research and appropriate external activities;
  - Writing or contributing to publications or disseminating research findings using media appropriate to the discipline;
  - Making presentations at conferences or exhibiting work in other appropriate events;
  - Assessing, interpreting and evaluating outcomes of research;
  - Developing new concepts and ideas to extend intellectual understanding;
  - Resolving problems of meeting research objectives and deadlines;
  - Developing ideas for generating income and promoting research area;
  - Developing ideas for application of research outcomes;
  - Deciding on / following research programmes and methodologies, often in collaboration with colleagues and sometimes subject to the approval of the head of the research programme on fundamental issues.
2. To contribute to teaching and learning programmes in the School and to supervise postgraduate research students.
3. To act as research team leader including:
  - Mentoring colleagues with less experience and advising on their professional development;
  - Coaching and supporting colleagues in developing their research techniques;
  - Supervising the work of others, for example in research teams or projects;
  - Developing productive working relationships with other members of staff;
  - Co-ordinating the work of colleagues to ensure equitable access to resources and facilities;
  - Dealing with standard problems and help colleagues to resolve their concerns about progress in research.
4. To routinely communicate complex and conceptual ideas to those with limited knowledge as well as to peers using high level skills and a range of media and to present the results of scientific research to sponsors and at conferences.
5. As determined by the nature of the project and at the direction of the PI, to plan, co-ordinate and implement research programme activity including:
  - Managing the use of research resources and ensure that effective use is made of them;
  - Monitoring and reporting on the use of research budgets;
  - Helping to plan and implement commercial and consultancy activities;
  - Where appropriate, to plan and manage own consultancy assignments.

This job description summarises the main duties and accountabilities of the post and is not comprehensive: the post-holder may be required to undertake other duties of similar level and responsibility. Please visit the Human Resources website to view the Research Fellow role profiles.

## **Person Specification - POSTDOCTORAL RESEARCH FELLOW**

<b>Competency</b>	<b>Essential</b>	<b>Desirable</b>
Attainments / Qualifications	PhD or equivalent qualification/experience in embedded systems or related field of study.	Be a nationally recognised authority in the subject area.  Experience of software-hardware implementation.  Knowledge and experience of programming in C/C++ or related software.
Skills and Understanding	Possess sufficient specialist knowledge in the discipline to develop/follow research programmes and methodologies. Record of research output in high quality publications.	
Prior Experience	Experience of managing research projects and research teams.	Experience of undergraduate /postgraduate teaching and supervision. Experience of acting as principal investigator on research projects.
Behavioural Characteristics	Excellent written and verbal communication skills.  Able to communicate complex and conceptual ideas to a range of groups.  Evidence of the ability to collaborate actively within the Institution and externally to complete research projects and advance thinking.  Able to participate in and develop external networks.  Able to balance the pressures of research, administrative demands and competing deadlines.	Able to identify sources of funding, generate income, obtain consultancy projects, or build relationships for future activities.
Circumstances or Additional Competencies/ Experience	Experienced in embedded systems and well versed with implementations, tuning and evaluations of control schemes on aerospace or robotic systems, or techniques which can be applied to these areas.	Experience or knowledge of Pixhawk flight control (or similar microcontrollers) as well as Ardupilot/Arducopter software is highly desirable.  Knowledge of sensors, actuators and signals processing  Knowledge of control systems and design techniques.  Experience or knowledge of aerospace systems especially in multirotor UAVs.  Ability to pilot a multirotor UAV will be an added advantage.

### **Informal Enquiries**

Before submitting an application you may wish to discuss the post further by contacting Dr Halim Alwi, telephone +44 (0)1392 72 3661 or email [h.alwi@exeter.ac.uk](mailto:h.alwi@exeter.ac.uk)

### **Terms & Conditions**

Our Terms and Conditions of Employment can be viewed [here](#).

### **Further Information**

Please see our [website](#) for further information on working at the University of Exeter.