Information on Postgraduate Research Scholarship - Ref: VCS-FES-09-22			
Faculty:	Engineering and Science	**School:**	Computing & Mathematical Sciences
Lead Supervisor:	Dr Stef Garasto		
Project Title:	Artificial Intelligence for Automated Collision Avoidance in Low Earth Orbit		
Project Description:	**Description.** Spacecrafts in Low Earth Orbit are essential to deliver many of today's technologies, like navigation services. However, remains from previous space operations have produced high amounts of debris that pose a constant collision threat to satellites – collisions that would cause damage and compromise the satellite's operations. Current methods of monitoring and avoiding accidental collisions are resource intensive, since they rely on manual intervention. The cost of false positives is also high – initiating an avoidance maneuver to remove the satellite from the collision path is expensive in terms of fuel use and interrupted data collection. Artificial Intelligence has the potential to mitigate this issue, and increase the efficiency of space operations, by automating the decision making process of the collision avoidance system. A recent challenge launched by the European Space Agency highlighted how current machine learning models still struggle to outperform naïve baselines and do not always incorporate measures of risk uncertainty, crucial in situations of high-stakes decision making. This project will advance the field by developing state-of-the-art artificial intelligence algorithms for automated collision avoidance that are accurate, efficient (to allow for deployment within satellites themselves) and able to provide a measure of uncertainty associated with the risk of collision. **Project aims.** This research has the following objectives: 1. Advance the state of the art of Artificial Intelligence (AI) algorithms for automated collision avoidance. This is a high impact application, whose ultimate aim is that of making space operations safer and more sustainable. 2. Release an open source AI model that can be built upon, and cited, by other research groups, nationally and internationally. 3. Publish the results in high impact international journals. **Supervisory team.** The supervisory team brings expertise in the development of AI algorithms for practical applications, including physical systems and medical imaging. The team has authored a wide range of peer-reviewed publications, including in international journals and conferences.		
Duration:	3 years, Full-Time Study or		

	6 years, Part-Time Study

Bursary available (subject to satisfactory performance):

Year 1: £17,668 plus London weighting where applicable (FT) or pro-rata (PT) Year 2: In line with UKRI rate Year 3: In line with UKRI rate

In addition, the successful candidate will receive a contribution to tuition fees equivalent to the university's Home rate, currently £4,596 (FT) or pro-rata (PT), for the duration of their scholarship. International applicants will need to pay the remainder tuition fee for the duration of their scholarship.

This fee is subject to an annual increase.

Person Specification of Essential (E) or Desirable (D) requirements:

Criteria:	**E or D**
Education and Training:	
• 1st Class or 2nd class, First Division (Upper Second Class) honours degree or a taught master's degree with a minimum average of 60% in all areas of assessment (UK or UK equivalent) in a relevant area to the proposed research project	**E**
• For those whose first language is not English and/or if from a country where English is not the majority spoken language (as recognised by the UKBA), a language proficiency score of at least IELTS 6.5 (in all elements of the test) or an equivalent UK VISA and Immigration secure English Language Test is required, if your programme falls within the faculty of Engineering and Science a language proficiency score of at least IELTS 6.5 overall with a minimum of 6.0 in all elements of the test or an equivalent UK VISA and Immigration secure English Language Test is required. Unless the degree above was taught in English **and** obtained in a majority English speaking country, e.g. UK, USA, Australia, New Zealand, etc, as recognised by the UKBA.	**E**
Experience & Skills:	
• Previous experience of undertaking research (e.g. undergraduate or taught master's dissertation)	**E**
• Strong background in machine learning, data science, artificial intelligence or related fields, relative to the candidate's career level	**E**
• Experience with python (or equivalent) and coding practices for scientific research. Knowledge of Git is a plus	**E**
• An understanding of issues related to low earth orbit collision avoidance and/or the aerospace industry more broadly	**D**
• Excellent collaborative skills and interest in partnership building with stakeholders of the research	**D**
• Experience with writing and publishing research papers, relative to the candidate's career level	**D**
Personal Attributes:	
• Understands the fundamental differences between a taught degree and a research degree in terms of approach and personal discipline/motivation	**E**
• Able to, under guidance, complete independent work successfully	**E**
Other Requirements:	

• This scholarship may require Academic Technology Approval Scheme approval for the successful candidate if from outside of the EU/EEA	**E**
• The scholarship must commence before ***April 2023***	**E**
Closing date for applications:	***midnight UTC on 18 January 2023***
For further information contact:	**Stef Garasto – s.garasto@gre.ac.uk**

Making an application:

Please read this information before making an application. Information on the application process is available at: https://www.gre.ac.uk/research/study/apply/application-process. Applications need to be made online via this link. **No other form of application will be considered**.

All applications **must include** the following information. **Applications not containing these documents will not be considered.**

- **Scholarship Reference Number (VCS-FES-09-22)**– included in the personal statement section together with your personal statement as to why you are applying. In the personal statement, please also briefly comment on why your experience, motivation and/or interests make you a good candidate for this scholarship.
- **a CV including 2 referees** *
- **academic qualification certificates/transcripts and IELTs/English Language certificate if you are an international applicant or if English is not your first language or you are from a country where English is not the majority spoken language as defined by the UK Border Agency** *

**upload to the qualification section of the application form. Attachments must be a PDF format.*

Before submitting your application, you are encouraged to liaise with the Lead Supervisor on the details above.