

It is important to note that this job description is a guide to the work you will be required to undertake. It may be changed from time to time to meet changing circumstances. It does not form part of your contract of employment.

Job description for the post of:

Research Assistant - Computer Science

EHA1924-0920

Fixed term for 6 Months

The post-holder will be:

Accountable to: Prof Nik Bessis, Head of Research/Head of Department

Reporting to: Dr Swagat Kumar, Principal Investigator

The Post

The post-holder will be working on a EHU funded Project titled “DeepHEC: Deep Reinforcement Learning for Hand-Eye Coordination”. The project involves researchers from Computer Vision, Machine Learning and Robotics research groups within the computer science department. The selected candidate will work closely with Dr Swagat Kumar, who will providing support to carry out research activities necessary for this project.

The DeepHEC project will focus on developing algorithms solving the hand-eye coordination problem which is about controlling robotic arms by using visual feedback from cameras to carry out various pick and place tasks. The approach will involve exploring several deep learning-based methods to overcome the limitations of traditional model-based methods. This research has application to the manufacturing, warehouse and parcel industry where robots could be used to automate various manual tasks which are difficult and dangerous for human workers while improving the overall efficiency of the company. The research outcomes will be published at least two reputed journals.

The ideal candidate should have a strong scientific interest, self-motivation and willingness to work as a team player within an interdisciplinary setup. You will support in designing and developing novel reinforcement learning algorithms with inputs from the involved researchers. The post requires you to have strong programming (e.g. C/C++, Python) skills with exposure to computer vision, machine learning and robotics. The knowledge of deep learning and hands-on-experience with one or more deep learning tools (e.g. TensorFlow, Caffe, Keras, PyTorch, etc.) is desirable. You should have appropriate technical, organisational, communicative, and creative skills to be effective in this project. You should also have knowledge on agile, iterative and data-driven methodology for developing software solutions.

Specific duties and responsibilities

The post holder will be expected to:

- a) Data collection/ generation: assist research team with data collection via use of various opensource simulation engines such as Gazebo or OpenAI GYM to generate data required for training RL models. The candidate is expected to spend some time in learning these tools. Any prior experience with these tools will be preferred.
- b) Algorithm/Software development, programming, testing and/or user evaluations.
Once the data is generated, we will develop various Deep RL algorithms to solve the hand-eye coordination problem. We already have some code which needs to be modified and extended. The code is written in TensorFlow, Lua and Python.
- c) Publications and disseminations. Providing support towards high-quality publications targeting top-tier computer vision conferences (e.g. IROS, ICRA, RSS, AAAI, IJCAI, ICML, BMVC, etc.) and journals (e.g. RAS, TSMC, TIE, TRO.).
- d) Literature searches. To undertake scoping surveys of bibliographic databases and literature search engines informed by up to date information on related research. Develop an understanding of a range of literature and gaps in literature.
- e) Attending and contributing to collaborative research meetings. Research Associate will be expected to attend and participate in group meetings, make presentation to other members and provide suggestions and ideas to improve on and extend current work.
- f) Presentation of results. Contribute to the presentation of external results and/or present results of research in international conferences/workshops, to internal groups/ Project Leader. Draft reports through appropriate word processing and data presentation software.
- g) Project administration. Some administration of projects under the supervision of the line manager, with responsibility for own areas of the project. Seek guidance when appropriate from Project Lead.
- h) Being an active member of Faculty/Department research groups and working groups associated with research projects within the Faculty.
- i) Initiating and, where appropriate, lead internal networks to facilitate collaborative decision-marking.
- j) Adherence to the University's research governance framework.
- k) Contributing to the production of bids for research funding.
- l) Provision of support for consultancy, research and evaluation activities.
- m) To make a positive contribution to the work of the Faculty/Department.

In addition to the above all Edge Hill staff are required to:

- a) Adhere to all Edge Hill's policies and procedures, including Equality and Diversity and Health and Safety
- b) Respect confidentiality: all confidential information should be kept in confidence and not released to unauthorised persons

- c) Undertake appropriate training and development as required
- d) Participate in Edge Hill's Performance Review and Development Scheme
- e) Adhere to Edge Hill University's environmental policy and guidelines and undertake tasks in a sustainable manner
- f) Demonstrate excellent Customer Care in dealing with all internal and external stakeholders.

Contract Type: Support – Fixed Term Contract for 6 months

Salary: Grade 5, points 19 - 22
£24,461 - £26,715 per annum

Hours: 36 ¼ hours per week

Pension: Local Government Pension Scheme

Annual Leave: 23 days per annum, pro rata

It is expected that the post-holder will work flexibly according to the on-going demands of the job.

Candidates should note that they will be shortlisted based on information provided on the application form with regard to the applicant's ability to meet the criteria outlined in the Person Specification form attached.

PERSON SPECIFICATION

Research Assistant - Computer Science Post Reference No: EHA1924-0920

CRITERIA: Applicants should provide evidence of their ability to meet the following criteria:

		Essential	Desirable	*Method of Assessment
Qualifications				
1	Qualified to degree standard in relevant subject area	x		A
2	Postgraduate qualification		x	A
Experience and Knowledge				
3	Experience of carrying out comprehensive literature reviews	x		S, I
4	Experience of development of research design and data collection using various simulation tools (Gazebo / OpenAI GYM etc.)	x		S, I
5	Experience of high-quality report writing	x		S
6	Experience of working in the Higher Education Sector		x	S
7	Experience in the use of appropriate programming language and software for data analysis	x		S, I, P
8	Knowledge of deep learning and/or hands-on-experience with deep learning tools		x	S, I
Abilities/Skills				
9	Demonstrate high level skills in in the use of Microsoft Office, particularly Excel, Word and the production of databases	x		S, P

		Essential	Desirable	*Method of Assessment
10	Able to work on own initiative, independently as well as part of a team	x		S, I
11	Able to organise and prioritise work effectively demonstrating flexibility and reliability to meet required deadlines	x		S, I
12	Able to work with integrity and manage effectively research data	x		S, I
13	Excellent communication skills both oral and written, with ability to present to audiences	x		S, I, P

***Method of Assessment**

(I-Interview, A-Application, S-Supporting Statement, T-Test, P-Presentation)

Please note that applications will be assessed against the Person Specification using this criteria.