

**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  
EHA2114-1121**

**The post-holder will be:**

**Accountable to:** Head of Department/Research

**Reporting to:** Prof. Yonghuai Liu, Principal Investigator

**The Post**

The post-holder will be working on a collaborative PhenomUK project named “DeepEarNet: Accurate Segmentation and Measurement of Cereal Grain Spikes Directly in Point Clouds Using Latest Deep Learning and Domain Knowledge”. The project involves competent researchers from Computer Vision, Pattern Recognition, Machine Learning, and Data Analytics. The ideal candidate will be placed within the Department of Computer Science and will be working closely with Prof Yonghuai Liu and Dr Ardhendu Behera. The project also involves external partner: National Plant Phenomics Centre, Institute of Biological, Environmental & Rural Sciences (IBERS), Aberystwyth University. The successful candidate will provide quality research support to enthusiastic academics leading this research project.

DeepEarNet aims to advance the state-of-the-art and develop an open-source pragmatic package for more accurate measurements of ears of wheat/cereal plants directly in the point clouds. The framework will improve the existing PatternNet for more accurate measurement of ears through considering other properties of the complex systems such as stability. It will also investigate how the ears can be better modelled, represented, and identified through considering and fusing, for example, their components (awn, rachis, and spikelet) as well such as leaves, stems, and their relative configurations, and adapting the collaborative learning approach. Finally, it will also explore how domain knowledge and experience can inform the process for the analysis of cereal point clouds such as colour and morphology.

The ideal candidate should have a strong scientific interest, self-motivation and willingness to work and explore as a team player within an interdisciplinary setup. You will take responsibility in designing and developing novel point cloud analysis algorithms with inputs from the involved researchers. The post requires you to have strong programming (e.g. Python, C/C++) skills and exposure to computer vision, pattern recognition, machine learning and AI. The knowledge of deep learning and hands-on-experience with one or more deep learning tools (e.g. TensorFlow, Keras, PyTorch, etc.) is desirable. You should have technical, organisational, communicative,

and creative skills and abilities. 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) Research design: participate in the design of the research and including identifying the most appropriate methods
- b) Data collection: The project partner (National Plant Phenomics Centre, Aberystwyth University) will capture the image and ground truth data. This role may involve in providing support or leading in managing and labelling data, and storing and transferring data between partners.
- c) Data processing and analysis: take the leading role in improving and developing deep learning based methods for the analysis of the given point clouds about the wheat/cereal architectures of interest, especially ears.
- d) Presentation of results: including to external audiences when required, both independently and as part of the team. Draft reports using appropriate word processing and data presentation software, making the data accessible to lay and expert audiences.
- e) Literature searches: in consultation with the PI, take a lead on conducting searches of bibliographic databases, library catalogues, books, journals and websites to ensure that our research is informed by current debates and scholarship in the discipline:
- f) Working as part of a team, write initial literature reviews and participate in systematic reviews as required.
- g) Scholarly publication: to lead the authoring of scholarly articles for publication in high quality, peer reviewed journals, targeting top-tier journals (e.g. IJCV, CVIU, Computers and Electronics in Agriculture, Plant Methods, Plant Science, New Phytologist, etc.).
- h) Project administration: take a lead with the overall administration of the project and be responsible for own areas of research.
- i) Abide by the University's research governance framework
- j) Attending and contributing to research team meetings.
- k) Contributing to the production of bids for research funding, supporting the development of research design and the identification of appropriate methods.
- l) To make a positive contribution to the work of the Department/Faculty.
- m) Undertake additional duties, as required by the project lead/principal investigator or Head of Department.

- n) Be an active member of departmental/faculty research committee and working groups associated with particular research projects within the department or faculty.

**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) To demonstrate excellent Customer Care in dealing with all internal and external stakeholders.

**Contract Type:** Support – Fixed Term Contract for 8.5 months

**Salary:** Grade 6, points 23 - 26  
£27, 924 - £30, 479 per annum, pro rata

**Hours:** 21.75 hours, three days 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  
EHA2114-1121**

**CRITERIA**

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

		<b>Essential</b>	<b>Desirable</b>	<b>*Method of Assessment</b>
<b>Qualifications</b>				
1	Qualified to degree standard in relevant subject area	*		A
2	Post Graduate Qualification with evidence of research	*		A
3	PhD		*	A
<b>Experience and Knowledge</b>				
4	Experience in designing and executing research using computer vision and machine learning methods	*		S/I
5	Experience of high quality report writing	*		S
6	Experience of searching bibliographic databases	*		S/I
7	Success in high-quality peer reviewed academic publication		*	S
8	Experience of coordinating complex administrative processes		*	S
9	Experience of working in the Higher Education sector		*	A
10	Advanced user of appropriate software for data analysis: Python, C/C++, Java3D, TensorFlow, Keras, PyTorch, etc.	*		S/I
<b>Abilities/Skills</b>				
11	Demonstrates high level skills in the use of Microsoft Office including Excel, Word, and creating databases	*		S/T
12	Able to work on own initiative, independently as well as part of a team	*		S/I
13	Able to organise and prioritise work effectively demonstrating flexibility and reliability to meet required deadlines	*		S/I
14	Excellent communication skills both oral and written	*		S/I

15	Able to work within ethical guidelines and maintain high levels of research integrity at all times, including the management of research data.	*		S/I
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**\*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.