

Department of Computer Science

MOA Technology Limited

Job Ref: REQ220684



Advert title: Artificial Intelligence and Machine Learning Scientist (KTP)

Period: 24 months

Salary: £32,000 - £35,000 per annum (Confirmation on offer of appointment) plus £2,000 training budget

Application deadline: Sunday 3rd July 2022

Key words: AI, Artificial Intelligence, Data Analytics, Computer Science, Computer Vision, Machine Learning, Deep Learning,

Project Title: Development of an automated AI weed and growth inspector for safe and effective herbicide development.

About the project

MoA Technology have developed an innovative approach to commercialise new herbicidal compounds with unrivalled effectiveness and safety. Through their expertise in plant sciences MOA have combined their unique herbicidal compound library with a multi-stage discovery screening platform. This revolutionary approach has uncovered herbicidal modes of action (MOA) that overcome herbicide resistance and environmental impacts. Whole plant herbicide impact and performance testing represent a vital stage in bringing herbicidal compounds to market ensuring high-yielding, safe food production.

This KTP will support commercial delivery of effective herbicides by developing an automated Artificial Intelligence (AI) inspector for data collection, collation and analysis of new compounds screening in whole plant glasshouse scale efficacy and toxicology trials. In particular, computer vision and deep learning based technology will be developed for plant recognition, segmentation and symptomology detection from glasshouse images. The innovative solution of the AI inspector will assure quantitative evaluation on herbicide control efficacy and provide a sustainable and economic approach for high standard herbicide discovery. We are seeking a highly motivated individual with the relevant skill set to join our project team.

MOA Technology

Established in 2017 MOA Technology Ltd are a small science led company at the forefront of ethical and sustainable crop protection (<https://www.moa-technology.com/>). Their highly experienced leadership team comes from across industry, science, technology and academia to drive innovation.

MOA aims to solve an urgent global problem with new mode of action herbicides that:

- respect human and environmental health
- support farmers with products to face the food supply challenge safely, consistently and efficiently
- advance the industry with a collaborative approach to sustainable integrated weed management

This 24-month project between Loughborough University and MOA Technology Ltd is joint funded with UKRI Innovate UK.

Loughborough University

Loughborough University is ranked in the top ten in the most recent Complete University Guide Guardian League Table and the Times Good University Guide. Its position as a research-leading university is confirmed through its recognition as one of the UK's Top-10 research-led universities in the most recent research excellence framework (REF 2014). It has been awarded a record of seven Queen's Anniversary prizes for its research impact to society and UK industry.

Loughborough University has outstanding research in science and engineering and world-class research facilities. Founded in 1974, the Department of Computer Science is part of the Loughborough University School of Science and was one of the first university computing departments established in Great Britain. The department has an excellent research record in AI, machine learning, robotics, computer vision, deep learning, data science, HCI, IoT, digital technologies, wireless sensor systems. with projects funded by UKRI Innovate UK, EPSRC, TSB, EU, NHS, Ministry of Defence, Home Office and our industry collaborators. In addition to our strong track record in fundamental research, a particular focus of our research is applied research aimed at supporting industry partners in creating both research and economic impact. A recent £100,000 upgrade of high-end GPU-based research computing facilities now complements a £9m investment in our purpose-built research and teaching space. The range of projects in this research area provide an excellent environment to support this project.

In joining the highly ranked Department of Computer Science the successful candidate will have access to a wide range of high-spec computing facilities including HPC, deep learning machines and workstations with the most recent high-performance GPUs and servers. They will also have full access to the selection of cutting-edge camera and vision systems within the department and fully instrumented AI-robotics laboratories.

About the KTP Associate Role

The successful candidate will be a highly motivated individual with formal qualifications in computer science or related subjects at MSc/PhD level or BSc with required experience. They will have experience in computer vision, machine learning, deep learning and image processing methods including data cleaning and migration. Analytical by nature, the successful applicant will have excellent knowledge of analytical techniques with experience in algorithm and software development. Candidates should have demonstrable programming skills e.g. Python, C++ and experience in deep learning platforms (e.g. PyTorch, TensorFlow). They should have authored original work for technical reports, and demonstrate excellent presentation, written and oral communication skills. The Associate will effectively manage business leaders and stakeholders working with end-users in a fastmoving commercial environment to optimise and deploy prototypes alongside existing approaches.

The KTP Associate will be based primarily at the Company premises in the Magdalen Centre, Oxford Business Park, Oxfordshire OX4 4GA, and will also spend time at Loughborough University with the academic team. They will be managed by Prof. Baihua Li and supervised by Prof. Qinggang Meng and Dr Haibin Cai experts in machine learning, computer vision, robotics and artificial intelligence. The Associate will form an integral part of the MOA Technology research and development team, working closely with company partners and the MOA supervisory team. As a KTP Associate the successful applicant will have

access to a wide range of commercial, R&D and management training programmes as well as technical training resources and facilities at Loughborough University.

For information contact: Prof. Baihua Li. (B.Li@lboro.ac.uk)

Job Description and Person Specification

Job Grade: Other

Job Purpose

The KTP Associate will:

- Work with stakeholders, including senior leaders, MOA commercial, sales and marketing functions, academic experts and MOA technical multi-disciplinary scientists, developing networks across the business to understand project requirements and deliverables.
- Develop understanding of the highly regulated herbicide industry and needs of current MoA customers.
- Determine technical scope, objectives, specification and opportunities for technology advancement.
- Experiment with complex artificial intelligence methods that consider the range and influence of independent variables, interactions and interdependencies.
- Develop novel artificial intelligence (AI) solutions to acquire and analyse high-quality data from herbicide-treated plants and controls.
- Assess available archived image data for suitability to analyse and detect treatment effects with the required specificity sensitivity and accuracy for the detection across the range of expected symptomologies.
- Develop deep-learning models, robust/fast learning algorithms, and databases/data warehouses satisfying quality performance indicators. Delivering protocols and workflows to enable testing and validation across future-users.
- Produce and deliver reports to the senior management team and employees across MOA business functions at different organisational levels.
- Provide training materials/workshops to MOA employees, collaborators and customers.

Job Duties

- Carry out the KTP project tasks and deliver the outcomes as outlined in the project work plan
- Manage the project and disseminate the findings to the project team
- Undertake KTP management training, as well as personal development training and courses as deemed necessary
- Write R&D reports, and present these at the Local Management Committee (LMC) meetings, as well as at national conferences and symposia with members of the project team
- Prepare research papers for publication in highly acclaimed learned journals, in line with the expected scholarly activities of the University Research Staff, and in accordance to the commercial sensitivity of collaborating companies
- Travel to Company clientele and to various other locations within the UK, and possibly overseas, as required
- To undertake such other duties as may be reasonably requested and that are commensurate with the nature and grade of the post

Points to Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Previous KTP associates or employees of MOA Technology Ltd are not eligible to apply for this KTP.

Applicants must have completed their last qualification (degree, masters, PhD) no more than five years before closing date.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to the KTP Lead Academic: Professor Baihua Li (B.Li@lboro.ac.uk)

Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage
Qualifications	MSc/PhD degree in Computer Science or related subjects, or BSc with required experience	1,2,3
Knowledge and Experience	Working experience in computer vision, machine learning, deep learning, and image processing	1,2,3
Knowledge and Experience	Experience in algorithm and software development	1,2,3
Experience	Authorship of original work, technical reports and presentations	1,2,3
Expertise	Demonstrable expertise in data analytics and machine learning methods and strategies	1,2,3
Skills and abilities	Excellent programming language skills e.g. Python, C++ and use of deep learning platforms (e.g. PyTorch, TensorFlow)	1,3
Skills and abilities	Ability to work both independently and as part of a team	1,2,3
Skills and abilities	Ability to communicate with a wide range of company and academic personnel	1,2,3
Skills and abilities	Excellent communication / presentation skills	1,2,3
Skills and abilities	Excellent technical writing skills	1,2,3
Training	Motivated to undertake KTP training modules and bespoke training as appropriate for personal and professional development	1,3
Other	To observe the University Equal Opportunities policies at all times	3

Desirable Criteria

Area	Criteria	Stage
Knowledge and Expertise	Demonstrates knowledge and experience of state of the art deep learning - based object recognition, segmentation and image classification	1,2,3
Knowledge and Expertise	Experience in carrying on theoretic study using mathematically sound approaches.	1,2,3
Knowledge and Expertise	Ability to take part in collaborative activities and work with technical staff and employees across different disciplines at all organisational levels.	1,3
Knowledge and Expertise	Demonstrates application of skills and expertise to solving real-world problems	1,2,3
Experience	Experience of working in R&D project management	1,2,3
Skills and abilities	Proven track-record of engaging diverse stakeholders in a change programme	1,2,3
Attributes	Self-motivated with ability to meet deadlines and achieve technical objectives at a high standard.	
Qualifications	Licensed to drive in the UK	1,3

Conditions of Service

The position is FULL TIME and FIXED TERM for 24 months. Salary will be between **£32,000 - £35,000** per annum at a starting salary to be confirmed on offer of appointment. The successful applicant will also receive a £2,000 per annum training budget.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found [here](#).

We strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>.

Applications

The closing date for receipt of applications is Sunday 3rd July 2022

Interviews will be held on 18th and 19th July 2022