



## AI Research Engineer (KTP Associate)

REQ210103

Period: 24 months

Salary: £30,000 - £40,000 per annum (Starting salary to be confirmed on offer of appointment)

Application deadline: **Sunday 21 March 2021**

**Key words:** artificial intelligence, deep reinforcement machine learning, computer science, software engineering

### Project Title:

The KTP will enable Singular Intelligence to add a novel module to its existing software programme (SiDAX). The new module will provide novel capabilities in strategic planning and operational decision-making enabling companies in the Fast-Moving Consumer Goods sector to optimise price, promotion and replenishment decisions.

### Introduction to KTP

A KTP (Knowledge Transfer Partnership) is a collaboration between a university and a company, jointly funded by the Company and Innovate UK.

This KTP is an 24 month project between Loughborough University and Singular Intelligence. KTPs aim to help businesses improve their competitiveness and productivity through the better use of knowledge, technology and skills that reside within the UK Knowledge Base.

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### Introduction to the company

Singular Intelligence sells applied AI solutions which optimise and automate commercial decisions. The solutions are targeted at the Fast-Moving Consumer Goods sector, retail, ecommerce / online retail and emerging autonomous retail companies for marketing and supply planning functions.

Singular Intelligence vision is to establish the paradigm of AI-augmented decision making in consumer goods and retail sector leveraging all relevant data and contextual factors : a) creating efficiencies at scale b) Retail collaboration and personalisation c) dynamic business model innovation d) enabling a circular economy, in the context of growing quantified markets and Industry 4.0.

Singular Intelligence has Unilever, Pepsi and Nielsen as customers and Microsoft, SAP and IBM as partners. The company charges an annual subscription fee for its software. There is further revenue from data engineering, consultancy and support.

Singular Intelligence is recognized as 'a top 50' retail tech company in Europe. Singular Intelligence aims to further develop their technology, business model and competitive advantage to dominate a rapidly growing market.

## University/Department summary

Loughborough University is a top-5 UK university, consistently ranked by the Guardian and other league tables. Its position as a research-leading university is confirmed through outstanding research in science and engineering and world-class research facilities. It has been awarded a record of seven Queen's Anniversary prizes for its research impact to society and UK industry.

Founded in 1974, the Department of Computer Science is one of the first university computing departments established in Great Britain. It is a part of the Loughborough University School of Science.

It has an excellent research track record in AI, machine learning, robotics, computer vision, deep learning, data science, HCI, IoT, digital technologies, wireless sensor systems etc. with projects funded by the Innovate UK, EPSRC, TSB, EU, NHS, Ministry of Defence, Home Office, KTP, and UK and International industry. In addition to having a strong track record of fundamental research, a particular focus of its research is applied research, aimed at creating research and economic impact by supporting industry.

A recent £100,000 upgrade of high-end GPU based research computing facilities within the Department of Computer Science, now complements a £9m purpose-built research and teaching space investment, access to the Midlands Plus High Performance Computing facility based within Loughborough University campus and the largest GPU facility in UK, JADE HPC, based in Oxford. A range of ongoing projects in these areas supported by active industry partners, 25+ academic staff and 60+ research staff provide an excellent research environment for this project.

## Project Outline

This 24 month KTP project aims to produce:

- An AI-based decision system that learns from all relevant data to automate strategic and operational decision simulations in real-time, communicating outputs via alerts and recommendations
- A new function to provide Singular Intelligence's customers with the power to interpret the analysis generated and to increase the level of confidence and trust they have in the decisions recommended by our product
- A system that adapts dynamically to changing market factors and new consumer data

The project exposes the associate to real-world problems in cutting edge knowledge of advanced AI technologies, such as deep reinforcement learning and explainable AI. Sitting at the cutting-edge of AI technologies, the successful associate will have access to a £2,000 pa grant for personal development & training, opportunities to use the Midlands Plus and JADE High Performance Computing (HPC) facilities as well as an academic support team of 40+ deep learning research staff at Loughborough University.

The challenges associated with this project include developing the AI methods and integrating them into the existing software at Singular Intelligence to build the proposed system, developing insight into the business strategies in the retail sector so that the product will fill the gap between automated decision-making and human understanding and interpretability, developing algorithms, implementing and testing them to satisfy the user requirements and practicing the software engineering knowledge and developing their technical skills to ensure the system will be scalable, reliable and user-friendly. A successful project combines academic rigour with a practical approach to problem solving in an exciting and demanding business area.

The successful Associate will be based within Singular Intelligence's team in central London but will work closely with academics at Loughborough University, Loughborough campus. The project will involve travel between London and Loughborough, as well as travel to other Singular Intelligence sites/clients as appropriate.

## Job Description

### Job Grade: Other

### Job Purpose

The KTP Associate will:

- Produce a requirements specification, design and construct methods for autonomous decision making
- Develop prototype models based on collated requirements for the product
- Conduct testing and performance evaluations alongside potential clients
- Assist with the development of marketing materials for the launch of the product
- Produce reports to senior management team
- Provide training materials/workshops to Singular Intelligence staff as necessary
- Contribute to academic research papers

### Job Duties

- Carry out the KTP project tasks within a cutting edge area of AI/ Deep Learning and deliver the outcomes as outlined in the project plan
- Manage the project, applying AI/ Deep Learning to an exciting and demanding business environment and disseminate the findings to the project team
- Undertake KTP management training, as well as other 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 other 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, but in accordance to the commercial sensitivity of collaborating companies. The Associate will have access to a high performance computing facility and a strong support network of colleagues working within the area of Deep Learning.
- Travel to Company clientele and to various other locations within the UK, and other 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 Singular Intelligence are not normally 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: Prof Qinggang Meng

## 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
Experience	Working experience in machine learning, data mining, big data, statistics or relevant AI areas	1,2,3
	Experience in algorithm development and software engineering	1,3
Skills and abilities	Programming skill: Python, C++, or machine learning platforms (e.g. Matlab ML)	1,3
	Excellent presentation / communication skills including the ability to write project reports and make technical presentations to industrial and academic research groups.	1,2,3
	Ability to work both independently, without supervision, and, as part of a team	1,3
	Ability to communicate with a wide range of academic and commercial personnel	1,2,3
Training	Willingness to undertake KTP training modules and other training as appropriate	3
Qualifications	Masters Degree or equivalent in Computer Science	1
Other	To observe the University Equal Opportunities policies at all times	3

### Desirable Criteria

Area	Criteria	Stage
Experience	Experience in carrying on theoretic study using mathematically sound approaches	1,3
	Experience working in R&D projects	1,3
	Working knowledge in deep learning and its frameworks	1,3
	Working knowledge of using reinforcement learning methods	1,3
Skills and abilities	Project management skills	1,3
	Excellent written and oral communication skills	1,3
	Excellent interpersonal, and organisational skills	1,3
	Ability to take part in collaborative activities and work with technical staff and people in other subject domains	1,3
	Self-motivated with ability to meet deadlines and achieve technical objectives at a high standard.	1,3
	Strong real-world problem-solving skills	1,3

	Licenced to drive in the UK	1,3
Qualifications	PhD in Computer Science	1

## Conditions of Service

The position is **full-time** and **fixed-term** for 24 months. Salary will be between £30,000 - £40,000 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 Grade 6 and above 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 Sunday 21 March 2021

The interviews will take place on Wednesday 31 March and Thursday 1 April 2021