UNIVERSITY OF LEEDS

CANDIDATE BRIEF

KTP Associate – Machine Learning Scientist: Deep learning-based gait analysis for domestic pets

Faculty of Engineering and Physical Sciences, and VET-AI Ltd.

Salary: £40,000 - £50,000 p.a plus training allowance of £5,000. This position is not on the University of Leeds salary scale.

Reference: CSRIS1143

Based at the company premises in Leeds, West Yorkshire
Fixed term for 30 months due to external funding for a fixed period. We will consider flexible working arrangements. This role is advertised subject to funding.

KTP Associate – Machine Learning Scientist: Deep learning-based gait analysis for domestic pets
School of Computing and VET-AI Ltd.

Do you have a PhD or post-doctoral experience in physics, maths, machine learning, artificial intelligence, deep learning, computational cognitive sciences, statistics or similar? Are you proficient in scientific software libraries, with experience in the software development lifecycle? Are you interested in applying your academic achievements in industry?

We have an opportunity for you to 'fast track' your career in industry by leading a strategically important project to a successful conclusion. Through a Knowledge Transfer Partnership (KTP), you will be working in partnership with VET-AI Ltd. and the School of Computing at one of the UK's leading research intensive universities. This will provide an excellent opportunity for you to utilise your academic achievements in an industry setting.

VET-AI is a fast-growing, R&D company deploying cutting-edge machine learning and AI approaches to veterinary (vet) care. During 2019, the company won a string of prizes including Tech Nation Rising Stars 2019 and featured in Gizmodo, Daily Mirror, The Times, and many others. VET- AI's strategic vision is to revolutionise the provision and access of vet services through digitisation, to improve animal health and welfare globally, and positively impact the lives of vet professionals by enabling remote working. The aim of this project is to develop and deploy the latest machine learning models and AI-driven video analysis models to analyse raw videos of pets to provide a diagnostic output for gait abnormalities such as arthritis. You will be managing the development, implementation and embedding of this innovative gait analysis tool for the automatic detection and diagnosis of animal mobility-related conditions, using a smartphone app. You will be expected to work with veterinary professionals, including those based at the Royal Veterinary College (RVC).

You will be based at the company premises in Nexus, University of Leeds, West Yorkshire, but will be formally employed by the University of Leeds for the duration of the project, a fixed period of 30 months, spending time at the University. The School


of Computing will provide academic and technical support to you throughout the project.

Vet-AI has a liberal working culture and is focused on long-term goals, not day-to-day management. The company takes its employees' wellbeing very seriously and even has a Chief Happiness Officer. You will have freedom to work in your own way, and you will only be measured by the project outcomes.

You will have access to a training and development package worth £5,000, to be spent according to your needs and the project's requirements, enabling you to work effectively on the KTP, and to plan for your future career. Additionally, you will attend two weeks of residential KTP training to equip you with the skills and knowledge required to complete the project successfully, for which time is allocated and funding provided.

What does the role entail?

As a KTP Associate, your main duties will include:

- Familiarisation with the business and its goals, including working across disciplines (tech development team and veterinary clinical team);
- Establishing a collaboration with the veterinary clinical team at Vet-AI to specify the problem of gait analysis from the perspective of veterinary professionals;
- Undertaking an evaluation of latest models and techniques in machine vision, and their computational overhead and ease of implementation;
- Acquire training data using web-scraping (eg BeautifulSoup and/or Selenium);
- Evaluating methods for imbalanced data sets when training models (some types of gait abnormality are more common than others); understanding what instructions should be given to users to achieve suitable standardisation, e.g. whether specific angles or bright-coloured markers on the animal's paws may be necessary;
- Breaking new ground in the field of computer vision to achieve the project's goals, leading to high-impact publications;
- Establishing output classes the model is aiming to generalise to, such as {healthy, asymmetric abnormality, symmetric abnormality}, or {healthy, limp, arthritis}, etc;
- Keep detailed and accurate records of all code, raw and analysed video data (including raw videos, time-dependent 3D wireframes of the pets bodies and


joints, deep-learning AI models based on these wireframes and pattern recognition models) facilitated by the creation of a highly curated data repository;
- Maintain comprehensive documentation for all key stages including all iterations of code and prepare training manuals to enable company's tech development team to understand the product development process;
- Create bespoke algorithms capable of processing large video datasets including technical reports that can be used for IP protection and or required for regulatory approval;
- Managing the risks of misclassification (e.g. cost matrix);
- Interdisciplinarity; working alongside the clinical team and other veterinary health professionals, including the Royal Veterinary College (RVC);
- Implementation stage: Model building, exploration, testing, and evaluation;
- Initial design for the clinical trial to assess performance against human vets;
- Project planning to deliver outputs, report progress and adapt plans as necessary;
- Presenting at conferences and submitting papers to quality publications;
- Disseminating and embedding new knowledge within VET-AI through training and documentation.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a KTP Associate you will have:

- A PhD, or post-doctoral experience in computer science, physics, maths, machine learning, artificial intelligence, deep learning, computational cognitive science, statistics or other numerate discipline;
- Proficiency with libraries such as TensorFlow, Theano, Caffe, or Keras;
- Proficiency in: Python, software version control with Git, continuous integration pipelines, and Unix-like operating systems (e.g. Linux, MacOS);
- Confidence with tackling unfamiliar fields of advanced mathematics;


- Experience of the full software development life cycle including design, development, testing, deployment, and maintenance;
- Experience of academic research in a quantitative discipline;
- An ability to efficiently select and evaluate academic journal articles, and an awareness of different mathematical, linguistic, and notational conventions used in academic literature;
- A confident and clear oral/visual presentation style;
- An interest not only in developing novel scientific methods, but also in their application;
- A willingness to learn about clinical aspects of veterinary sciences;
- A willingness to take an experimental and exploratory approach to solving problems, within time constraints and with a focus on deliverables;
- Commercial awareness;
- A positive attitude, which is central to the company's culture;
- Resilience, and a pragmatic approach;
- Strong initiative and a proactive approach, with excellent organisational, planning and self-management skills, including the ability to adapt, to prioritise workloads to meet deadlines/demand and to deliver high quality work under pressure.

You may also have:

- A record of publications in internationally-recognised journals;
- Experience of delivering presentations at academic or industry conferences;
- Relevant industrial experience.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information. Applications should be submitted by the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Dr Derek Magee
Tel: +44 (0)113 343 6819
Email: D.R.Magee@leeds.ac.uk

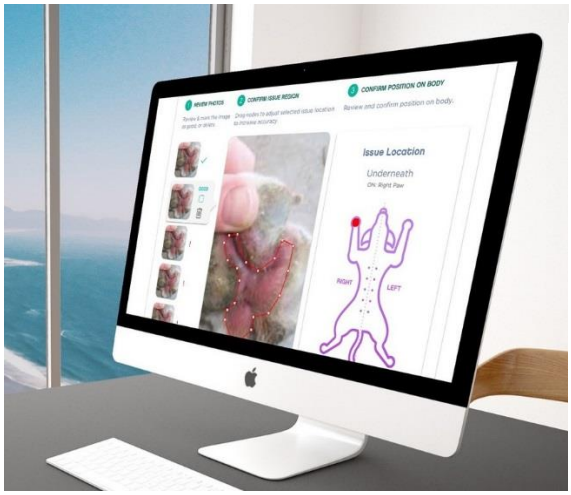
Professor David Hogg
Tel: +44 (0)113 343 5765
Email: D.C.Hogg@leeds.ac.uk

Dr Trevor Hardcastle
Tel: 07706406701
Email: th@vet-ai.com

Additional information

VET-AI
ANIMAL TECHNOLOGIES

Candidates must be available for an onsite interview at the company premises.
The business's long term plan is to support continued business growth through continued research and development. Pending the outcome of the project, the Associate will be in a prime position to occupy a function at the business beyond the duration of the KTP.



Working as a KTP Associate
You will be employed by the University of Leeds and will have access to University facilities. However, you will be based for the majority of your time at the company premises, working to their terms.
You will have access to the University's USS pension scheme, with generous employer contributions.

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering and Physical Sciences and the School of Computing.

A diverse workforce
The Faculty of Engineering and Physical Sciences is proud to have been awarded the Athena Swan Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found in our Accessibility information or by getting in touch with us at disclosure@leeds.ac.uk.

The post is located at the company premises. Candidates with disabilities wishing to review access to the building are invited to contact Laura Dugdale (Research and Innovation Service), L.Dugdale@Leeds.ac.uk or Tel: 0113 343 0928.

Criminal record information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position, however, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information.