Research Associate (Machine Learning and Machine Vision)

Hiring organization
Candidate-1st

Employment Type
Full-time

Beginning of employment
asap

Job Location
Edinburgh, Midlothian, United Kingdom

Working Hours
40

Base Salary
euro GBP 36K - 45K

Date posted
May 18, 2024

Description

Salary: Grade 7 (£36,023 – £45,585)

Contract: Full-time (35 hours a week), Fixed-Term for 9 months

Detailed Description

We are looking for a highly experienced and skilled PDRA who will work on the EPSRC (Part of the UK national research council) projects EP/V051164/1/1 “Developing Machine Learning-empowered Responsive Manufacture of Industrial Laser Systems“ and EP/Y017307/1 “Autonomous and Intelligent Laparoscopy Trainer with Real-Time Feedback”. The former project aims to develop new automated robotic processes for the assembly and manufacture of industrial laser systems taking advantage of the latest research in robotics and machine learning. The PDRA will be responsible for developing machine learning techniques to automate laser alignment and assembly of optical pieces. A fundamental challenge in building optical laser systems is alignment of pieces, which typically requires high skills and much time. An automated mechatronic system can embed machine intelligence inspired from human expert performances. The PDRA will be responsible for developing the machine intelligence for automation, search and optimization algorithms. The latter project aims to develop an automated laparoscopy training system, which can provide feedback to the trainees. The task of the PDRA in this second project will be to develop machine intelligence to classify and categorize videos of expert and novice performances and to develop the video streaming setup to retract, embed, and visualize relevant videos at the same time and on top of each other.

These are exciting interdisciplinary projects that relate to machine learning and machine vision, both housed within the new multi-million pounds National Robotarium facility at HWU. National Robotarium (https://www.hw.ac.uk/uk/research/the-national-robotarium.htm) is an exceptional facility bringing together academic research and industry in Heriot-Watt University campus and housing extremely impactful industry-oriented research.

Candidates will have a strong interest and background in machine learning and machine vision with a PhD degree, or equivalent experience. Strong competences in robotics, mechatronics, control, software engineering, software development including embedded systems are desirable.

The position should start on 1st of July 2024, but applications will be fully considered until the position is filled. The position will be on the basis of 9 months long contracts till March 31st, 2025.

Key Duties and Responsibilities:

The post holder is required to;

- Assist the development of student research skills, and be expected to contribute to the assessment of student knowledge in the context of teaching and supervision duties. Could be expected to contribute to specialist courses such as research methods and equipment.
- Develop research objectives and proposals for own or joint research with the assistance of a mentor, if required. Conduct individual and collaborative research projects, making use of relevant research techniques and methods. Disseminate results of research in peer reviewed journals and conferences, and/or other appropriate media. Continue to update personal knowledge and to develop skills within own specialist research area. Maintain written records of research results and progress generated intellectual property and data analysis. Contribute to the production of research reports and publications.
- Write research reports and publish journal and conference papers. Analyse and interpret the results of own research and generate original ideas bases on outcomes. Prepare proposals and applications to external bodies, e.g. for funding purposes. Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio.
- Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration. Work with academic colleagues on areas of shared research interest and contribute to collaborative decision making. Join external networks to share information and identify potential sources of funds.
- Provide guidance as required to support staff, research students and any other students who may be assisting with the research.
- Contribute, under supervision, to the planning of research projects, including the development of new grant/contract proposals. Make internal and external contacts to develop knowledge and understanding and form relationships for future collaboration.
- We are looking for a creative and highly motivated researcher willing to work as part of a team.
- The ideal candidate will have a strong theoretical understanding and an experimental background in one or more of the following fields:
- Machine learning
- Machine vision
- Mechatronics
- Robotics
- Control
- Good communication skills and an appropriate publication record are essential.
- General tasks will involve scientific research; analysis and interpretation of data; writing and publishing papers; daily oversight of the activities of postgraduate and undergraduate project students in the laboratory; communication with other investigators involved in this collaborative project; presentation of research at conferences.
- The successful candidate will be expected to conduct and lead their own experiments whilst also supervising the activities of junior group members and PhD students.
- Responsibilities will also include assistance in the day-to-day maintenance of the experimental facilities, liaising with companies and external collaborators.
- The successful candidate is also expected to be involved in our outreach activities, with roles that can be tuned to the specific preferences of the candidate but will involve for example interviews, talks for the general public and preparation of experimental demonstrators.

Education, Qualifications & Experience:

Essential Criteria

- Applicants should hold a PhD in a relevant area of machine intelligence and machine vision or related subject (or a thesis submitted by the start date of the project).
- Possess and maintain sufficient breadth or depth of specialist discipline knowledge and or research methods and techniques to work in own area.
- Experience of working in a team and/or multi-cultural work environment.
- A record of high-quality publications, for stage in career, and evidence of contribution to the writing of these publications proportionate to opportunity.
- Experience with machine learning and/or machine vision applied to research in a relevant discipline.
- Must have proven academic ability and a demonstrable high level of technical competence in experimental science and the analysis / modelling of the results.
- Ability to formulate and progress work on their own initiative.
- Must be able to work as part of a team on the experiments at Heriot-Watt and more widely with the collaborators at other Universities and Industrial Partners.
- Experience in public presentations of scientific results (e.g. conference talks).

Desirable Criteria

- Evidence of ability to present work effectively in person, e.g. at conferences and seminars.
- Previous experience with one or more of the following: robotics, medical robotics, video processing, deep learning, image processing, machine learning.
- Experience in leading the writing of scientific papers.
- Experience of programming, system integration and communication across sensors and actuators, data acquisition and analysis.
- Evidence of ability, subject to opportunity, to guide other researchers, e.g. PhD students and undergraduate project students.
- Experience of research-student supervision.
- Capability to be self-directed and think innovatively.

About our Team

The School of Engineering and Physical Sciences (EPS) at Heriot-Watt University, Edinburgh, UK, is recruiting a post-doctoral research associate (RA) to work successively on the EPSRC funded projects EP/V051164/1/1 “Developing Machine Learning-empowered Responsive Manufacture of Industrial Laser Systems” and EP/Y017307/1 “Autonomous and Intelligent Laparoscopy Trainer with Real-Time Feedback”.

The robotics and machine intelligence research group at the Institute of Sensors, Signals and Systems (ISSS) aims to develop robotic technologies for industrial and medical applications. Our research related to this position focuses on development of machine learning techniques to automate laser alignment in optical systems and

to process video streams in a laparoscopic training system, both are related to machine vision, machine learning, and mechatronics systems.

About our Organisation:

Heriot-Watt University has established a reputation for world-class teaching and leading-edge, relevant research, which has made it one of the top UK universities for innovation, business and industry.

Heriot-Watt University has five campuses: three in the UK (Edinburgh, Scottish Borders and Orkney), one in Dubai and one in Malaysia. The University offers a highly distinctive range of degree programmes in the specialist areas of science, engineering, design, business and finance. Heriot-Watt is also Scotland's most international university, boasting the largest international student cohort.

How to Apply

The deadline for applications is midnight on 6th June 2024. It is anticipated that shortlisted candidates will be invited to interview w/c 10th June. Successful candidates will be notified as soon as possible thereafter.

Applicants should provide the following documents and apply through the online application website. Applications with incomplete documentation will not be considered.

-Letter of motivation highlighting relevance of background to the projects,

-CV

-Two major publications in relation to the projects,

-Two reference letters

It is recommended to contact Dr Erden (M.S.Erden@hw.ac.uk) by email for a first expression of interest, as well as any informal inquiry, prior to a formal application.

At Heriot-Watt we are passionate about our values and look to them to connect our people globally and to help us collaborate and celebrate our success through working together. Our research programmes can deliver real world impact which is achieved through the diversity of our international community and the recognition of creative talent that connects our global team.

Our flourishing community will give you the freedom to challenge and to bring your enterprising mind and to help our partners with solutions that can be applied now and in the future. Join us and Heriot Watt will provide you with a platform to thrive and work in a way that also helps you live your life in balance with well-being and inclusiveness at the heart of our global community.

Heriot-Watt University is committed to securing equality of opportunity in employment and to the creation of an environment in which individuals are selected, trained, promoted, appraised and otherwise treated on the sole basis of their

relevant merits and abilities. Equality and diversity are all about maximising potential and creating a culture of inclusion for all.

Heriot-Watt University values diversity across our University community and welcomes applications from all sectors of society, particularly from underrepresented groups. For more information, please see our website https://www.hw.ac.uk/uk/services/equality-diversity.htm and also our award-winning work in Disability Inclusive Science Careers https://disc.hw.ac.uk/ .

We welcome and will consider flexible working patterns e.g. part-time working and job share options.

Use our total rewards calculator: https://www.hw.ac.uk/about/work/total-rewards-calculator.htm to see the value of benefits provided by Heriot-Watt University.

How the process will look like

Your teammates will gather all requirements within our organization. Then, once priority has been discussed, you will decide as a team on the best solutions and architecture to meet these needs. In continuous increments and continuous communication between the team and stakeholders, you're part of making data play an even more important (and understood) part withing Brand New Day.

Job Benefits

GBP 36K – 45K