



OPPORTUNITY

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Reference: 0047-25

Salary: £40,000 with up to £6,000 dedicated development and training budget

Contract Type: Fixed term (36 months)

Basis: Full time

Job description

Job Purpose:

This 36-month project takes the form of a [Knowledge Transfer Partnership](#) (KTP), which provides you with practical and formal training and the availability of support from experienced mentors from [Aurrigo International Plc](#), [Aston University](#) and [Innovate UK Business Connect](#).

Main Duties/Responsibilities:

This Knowledge Transfer Partnership (KTP) project aims to develop a dynamic, optimised efficiency software platform to transition Aurrigo's fleet management for airport baggage/cargo-handling autonomous vehicles from centralised, human-control to a decentralised, autonomous command-and-control system.

The project will transition Aurrigo's AV fleet management platform (Auto-Connect) from a centralised, human-controlled system to a decentralised, autonomous decision-making system. To achieve this, the project will address key challenges in the following areas:

- ▶ **Delegation:** Intelligent systems for dynamic task assignment based on real time assessments of each AV's status, location, capabilities, and workload.
- ▶ **Cooperation/Competition:** Robust communication protocols for seamless data exchange and selecting the optimal vehicle for the task-at-hand autonomously.
- ▶ **Coordination:** Algorithms synchronising AV actions using exchanged data to prevent conflicts and enhance efficiency.
- ▶ **Planning:** Design mechanisms to autonomously generate and adapt AV movements/tasks in real-time in the dynamic airport environment.

The KTP will pioneer the latest scientific advancements in multi-agent systems, federated learning and game theory. The project is highly novel including development of decentralised algorithms enabling AVs to delegate tasks, plan activities and coordinate actions amongst themselves with minimal message passing. This approach will ensure efficient, autonomous decision-making instead of error-prone human-controlled task allocation.

Candidate Profile: PhD in Computer Science, Artificial Intelligence (AI), or closely related field namely, physics, applied mathematics or electrical engineering.

Essential skills/ experience required include:

- ▶ Strong understanding of machine learning algorithms, including deep and federation learning, particularly their application in autonomous systems.
- ▶ Expertise in multi-agent systems and decentralised coordination
- ▶ Experience with simulation techniques for complex systems.
- ▶ Strong analytical and problem-solving skills, with the ability to conduct high-quality independent research.
- ▶ Project management skills, including familiarity with Agile methodologies and tools.
- ▶ Strong coding ability, with experience in relevant programming languages (e.g. Python, C++, or MATLAB).

Desirable:

- ▶ Industrial experience in autonomous vehicle systems or similar technological environments.
- ▶ Experience with Partially Observable Markov Decision Processes (POMDPs) and their decentralised applications.
- ▶ Familiarity with Game Theory principles, particularly in competitive scenarios.
- ▶ Knowledge of Federated Learning and its implementation in distributed systems.

Personal attributes:

- ▶ Strong interpersonal, communication and presentation skills.
- ▶ Leadership qualities, resilience, autonomy in organisation, and time management skills to deliver the KTP project and ensure it achieves planned milestones and objectives.
- ▶ Ability to work independently and use initiative.
- ▶ Strong desire to pursue innovative approaches and pathways
- ▶ Ability to work closely with cross-disciplinary stakeholders and establish an effective knowledge transfer process in the company.

Main responsibilities:

- ▶ Research, develop, and optimise machine learning algorithms, including deep learning, for AV control and coordination.
- ▶ Apply multi-agent systems to enhance decision-making and task delegation.
- ▶ Integrate and test algorithms within Aurrigo's software and control systems.
- ▶ Conduct evaluation through simulation and real-world testing.
- ▶ Contribute to dissemination, reporting, and collaboration with industry and academic partners.
- ▶ Support project management and adapt to evolving priorities.

Additional responsibilities

- ▶ Engage in continuous personal and professional development in line with the demands of the role, including undertaking relevant training and development activities.
- ▶ Ensure and promote the personal health, safety and wellbeing of staff and students.
- ▶ Carry out duties in a way which promotes fairness in all matters and which engenders trust.
- ▶ Promote equality of opportunity and support diversity and inclusion as well as working to support the University's environmental sustainability agenda and practices.

Person specification

	Essential	Method of assessment
Education and qualifications	<ul style="list-style-type: none"> ▶ PhD in Computer Science, Artificial Intelligence (AI), or a closely related field (e.g., Physics, Applied Mathematics, Electrical Engineering). 	Application form and interview
Experience	<ul style="list-style-type: none"> ▶ Machine Learning algorithms (including deep and federated learning), with a focus on their application in autonomous systems. ▶ Multi-agent systems and decentralised coordination. ▶ Simulation techniques for modelling and testing complex systems. 	Application form and interview
Aptitude and skills	<ul style="list-style-type: none"> ▶ Advanced research, planning and reporting skills, with a demonstrated ability to conduct high-quality, independent research. ▶ Project management skills, including familiarity with Agile methodologies and tools. ▶ Strong coding ability, with experience in relevant programming languages (e.g. Python, C++, or MATLAB). 	Application form and interview

	Desirable	Method of assessment
Education and qualifications	<ul style="list-style-type: none"> ▶ Industrial experience in relevant fields ▶ Prior work in autonomous vehicle systems or similar technological environments. ▶ Experience with Partially Observable Markov Decision 	Application form and interview

	Processes (POMDPs) and their decentralised applications.	
Experience	<ul style="list-style-type: none"> ▶ Industrial experience in relevant fields ▶ Prior work in autonomous vehicle systems or similar technological environments. ▶ Experience with Partially Observable Markov Decision Processes (POMDPs) and their decentralised applications. 	Application form and interview
Aptitude and skills	<ul style="list-style-type: none"> ▶ Familiarity with Game Theory principles, particularly in competitive scenarios. ▶ Knowledge of Federated Learning and its implementation in distributed systems. 	Application form and interview

University values

All staff are expected to demonstrate/promote the University's values and expectations, which are an integral part of our strategy and underpin the culture of the University. In addition, our leaders are expected to be accountable, help to execute strategic visions of the University and share and set clear expectations that inspire those around them.

Values + Behaviours

				
Innovation	Collaboration	Ambition	Inclusion	Integrity
We strive for excellence within ourselves and others, providing solutions to new and existing challenges.	We work best when we are collaborative, working together to contribute to the Aston community.	We strive together for improvement and innovation looking ahead to see the bigger picture.	We treat everyone in our community equally and how they would like to be treated.	We are open, honest and fair. We take ownership of the way we work and how we treat each other.

How to apply

You can apply for this role online via our website <https://www2.aston.ac.uk/staff-public/hr/jobs>.

Applications should be submitted by 23.59 on the advertised closing date.

All applicants must complete an application form, along with your CV.

Any CV sent direct to the Recruitment Team and Recruiting Manager will not be accepted.

If you require a manual application form, then please contact the Recruitment Team via recruitment@aston.ac.uk.

Contact information

Enquiries about the vacancy:

Name: Dr Farzaneh Farhadi, School Of Computer Sci And Digital Technology, Engineering and Physical Sciences

Email: f.farhadi@aston.ac.uk

Enquiries about the application process, shortlisting or interviews:

Recruitment Team via recruitment@aston.ac.uk or 0121 204 4500.

Additional information

Visit our website <https://www2.aston.ac.uk/staff-public/hr> for full details of our salary scales and benefits Aston University staff enjoy.

Salary scales: <https://www2.aston.ac.uk/staff-public/hr/payroll-and-pensions/salary-scales/index>

Benefits: [Benefits and Rewards | Aston University](#)

Working in Birmingham: <https://www2.aston.ac.uk/birmingham>

Employment of Ex-Offenders: Under the Rehabilitation of Offenders Act 1974, a person with a criminal record is not required to disclose any spent convictions unless the positions they applying for is listed an exception under the act.

Eligibility to work in the UK:

Non-UK/Irish nationals will require a visa or immigration permission that allows them to work in the UK.

The most common work visas are the [Skilled Worker](#), [Global Talent](#) and [Graduate](#) immigration routes. You can find more information about these visa categories on our [web page for candidates](#). The [UKVI website](#) provides further detail about different work visas and the eligibility criteria for each.

Academic Technology Approval Scheme (ATAS):

If you will conduct research in your role and you apply for a Skilled Worker or Temporary Worker GAE visa, you may need to apply for and obtain ATAS clearance before Aston can issue a Certificate of Sponsorship for your visa application.

This process can take at least 6 weeks to process, and Aston will consider this when confirming your expected start date. Processing times will increase between April and September and can longer to complete.

There is no fast-track option available. ATAS certificates will be processed in order of receipt.

You can find more information about ATAS on our candidate immigration page.

Before you start and Right to Work

90-day entry vignette

If you have applied for your visa outside of the UK, you will receive a vignette in your passport which is usually valid for 90 days. Please make sure to travel to the UK within the 'valid from' and 'valid to' dates on this visa. If you entered the UK before or after these dates, you would not 'activate' the visa and you would need to leave and re-enter the

country.

You will also receive a decision letter confirming details about your immigration permission and where to collect your Biometric Residence Permit.

Cost of Living - Estate and Letting Agents

There are numerous Estate and Letting Agents in and around Birmingham that can help you find suitable accommodation. The Midland Landlord Accreditation Scheme provides a list of professional agencies and landlords who have applied with them for accreditation. Whilst accreditation is not a guarantee of quality, it provides some reassurance about the standard of the service they provide.

You can also use property search websites such as Rightmove or Zoopla.

Equal Opportunities

Aston University promotes equality and diversity in all aspects of its work. We aim to ensure, through our admissions policies for students, and our staff recruitment and selection processes that we encourage applications from all groups represented in the wider community at a local, national and international level.

The University will endeavour not to discriminate unfairly or illegally, directly or indirectly, against student or potential students, staff or potential staff. This commitment applies to all functions of the University and to any stage of an individual's career.

An Equal Opportunities Monitoring Form is included within the application form. Data you provide on the Equal Opportunities Monitoring Form will be included in a general database, for statistical monitoring purposes, enabling the University to monitor the effectiveness of its Policy, Codes of Practice and Guidelines on Equal Opportunities in Employment. Individuals will not be identified by name.

Data Protection

Your personal data will be processed in compliance with the Data Protection Act 2018 and the General Data Protection Regulation ((EU) 2016/679) ("GDPR"). The University's Data Protection Policy and Privacy Notices, including the Job Applicant Privacy Notice can be found at <https://www2.aston.ac.uk/data-protection>. Your application will only be used to inform the selection process, unless you are successful, in which case it will form the basis of your personal record with the University which will be stored in manual and/or electronic files. Information in statistical form on present and former employees is given to appropriate outside bodies.

Full details of our terms and conditions of service and associated policies and procedures are available online at <https://www2.aston.ac.uk/staff-public/hr/policies>

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