Accenture – FS.AI – Reinforcement Learning

TIN-ACC-026

About the Organisation
Accenture’s FS.AI practice supports our financial services clients and sits within the wider multidisciplinary Data & AI team of experts across a range of academic and industry backgrounds. Join our team to help transform leading organisations and communities around the world. Accenture is driving these exciting changes and bringing them to life across 40 industries in more than 120 countries. The sheer scale of our capabilities and client engagements and the way we collaborate, operate, and deliver value provides an unparalleled opportunity to grow and advance.

Role Description and Responsibilities
The advances in artificial intelligence, machine learning and use of data are creating unprecedented opportunities for society and our clients to benefit. The transformation has already begun with AI driving much of our day to day lives, and we expect the rate of innovation in AI to only accelerate. The positive opportunities AI affords also contrast with significant risks that can arise from the inappropriate use of AI. It is critical to understand the range of harms and risks to citizens and society from AI, and to develop approaches that allow AI technologies to be used responsibly, ethically, and lawfully.

This internship aims to expand on our work with the Turing Institute on Pricing Insurance with reinforcement learning. In order for Accenture FS.AI to be able to bring Reinforcement Learning agents to our clients, we need to establish solid responsible design and model explainability frameworks. The use of AI-based techniques in the field of financial services is strictly regulated requiring our clients to explain automated decisions and demonstrate responsible system design. With traditional deterministic machine learning methods, we typically meet these obligations via local and global model agnostic interpretability methods. These methods, however, do not translate well in the field of Reinforcement Learning algorithms, due to multiple constraints intrinsic to the stochastic nature of these models. The aim of this internship will be to design and develop a theoretically solid novel framework to support our need for model explainability and responsible AI in our future Reinforcement Learning projects.

The Opportunity
We are seeking a passionate advocate for responsible approaches to AI development and use, and we are providing an opportunity for you to explore and develop approaches to address some of the most critical challenges in responsible AI for reinforcement learning. You will be motivated by the opportunity to co-design a research goal within the field of responsible AI & Reinforcement Learning that helps advance knowledge and application of responsible by design.
You will also have fantastic opportunities to support a range of ongoing Accenture efforts in reinforcement learning and responsible AI. This may include working with clients who have engaged Accenture to help them with their responsible AI journey or working with our data science and AI engineering teams to develop models and frameworks for example.

This role will require strong Python programming skills, including object-oriented and test-driven development, and a good understanding of statistical concepts related to machine learning models; specifically, reinforcement learning and model agnostic interpretability methods.

**Intern Responsibilities:**
The activities and responsibilities of the role will depend on the accepted proposal; however, we anticipate the role to support the FS.AI Research & Development team by:
- Design framework, including literature review and investigation of theoretical soundness of approach.
- Implementation of proposed ideas in Python.
- Defining an experiment that can test/validate or demonstrate proposed approaches
- Writing up experiment results.

**Expected Outcomes**
The outcome of the internship will depend on the subject being addressed within the internship and for which we invite you to suggest possible projects as part of your application. Please see the details below.

We invite applicants to use the dedicated question for this role on the application form to outline your proposal for an action-orientated, 6-month, research project within the field of Responsible AI for reinforcement learning.

Your proposal should be outcome and practically focused and structured to ensure a short phase of research can be followed with the development of tools, prototypes, frameworks, artifacts that can be used to advance the cause of responsible AI for reinforcement learning.

Some suggested areas you might explore are listed below, but you should not be constrained by these suggestions if you can advocate for the link to responsible AI and reinforcement learning:
- investigate model agnostic explainability techniques and understand how to adapt and apply these approaches to deep reinforcement learning algorithms to enable global & local interpretation of agents and local interpretation of predictions.
- investigate how to monitor an agent’s action-drift in a production setting, to understand how the agent’s behaviour is changing whilst the agent is learning online.

**Supervision and Mentorship**
This role will be supervised by, and report into Accenture’s FS.AI Data-Science community co-lead Isaac Bowers-Barnard.

**Person Specification**
The ideal intern will have:

- A demonstrable passion for responsible AI and/or reinforcement learning
- Be undertaking a PhD in a subject or research group considering technical, social, legal, or ethical issues with AI
- Ability to pause their PhD for the duration of the internship and to return to their studies upon completion

**Internship Logistics**

This internship will be based in Accenture’s UK HQ in Fenchurch Street, London.

Start date: January/February 2024  
Duration: 6 months  
Remuneration: It will be pro-rated based on an equivalent annual salary of £35,000.

*This is a full-time position, and we regret that we are unable to consider part-time applications.*