The Alan Turing Institute

Royal Navy FASTER – Distrusting Artificial Intelligence: Data Scientist

About the Organisation

This is a unique opportunity to get involved in challenging and unusual problems in submarine operations.

Underwater operations are extremely demanding and full of risk. Passive SONAR is the primary sensor on submarines, silently "listening" for danger hiding in the ocean noise. Submarines must detect before being detected.

This internship contributes to the Royal Navy's FASTER programme which is rapidly inserting new technology into the heart of submarine systems. FASTER engages with a wide variety of suppliers, from academic subject matter experts to large defence contractors, who provide unusual, radical, new capability to give our submarine crews advantage in the contested oceans.

FASTER has already completed an Alpha release of a submarine management system and is now building a 'Platform-as-a-Service' running a skeleton submarine management system, using Agile working practice, to evaluate the provided new capability. This combination of technologies and ways of working gives the Royal Navy a faster, more reliable, way to incorporate technology under its own control and ownership.

[A FASTER way forward for Defence Innovation - YouTube](#)

The FASTER programme is sponsored by the Defence Nuclear Organisation and works with Navy Digital Service and Defence Science & Technology Laboratory to deliver new capability into the Submarine Delivery Agency Innovation Hub.

Role Description and Responsibilities

While Artificial Intelligence can contribute extraordinary capabilities, badly trained AIs can be worse than useless. There are several efforts to evaluate how well an AI has been trained, based on examining the training sets and outcomes of test set applications. Some of these can also be used to assure the initial training sets are suitable.

Your role will be to:

- Review the literature on existing ways of evaluating AI.
- Select and implement at least one as an assurance analysis.
- Select and gather suitable data sets.
- Write a software service that can examine an AI service using a suitable range of test

data and produce a report about its trustworthiness.

You will join a team of expert software engineers, developers, data scientists, technical architects, business developers and Royal Navy personnel delivering the FASTER programme.

You will be independent, energetic, resourceful, and good at explaining complicated concepts to a non-expert audience. As part of your role, you will transfer knowledge of data science techniques and machine learning to the wider FASTER team.

We are an Agile team, and you will be expected to attend regular Stand ups, and update meetings with team members and contribute towards current Sprint goals.

Expected Outcomes

- A literature review of rigorous processes that could be applied to assure platform safety when exploiting AI (ML) based processing.
- Implementation of an AI evaluation using a test data set for assurance analysis of the algorithm.
- An AI evaluation software service app.

By the end of the project, you will have a good grasp of the training characteristics required for AI systems, experience in assuring AIs and you will have a delivered an important component that supports the FASTER programme's evaluation of AI capability.

Supervision and Mentorship

You will be a self-starter with the ability to work both independently and part of a multi-disciplinary team.

You will be mentored by the FASTER data lead and the technical architect both of whom will provide you with the necessary detailed background to the problem, support you and review your work.

Person Specification

Someone who enjoys a challenge and is keen to develop on existing knowledge and deliver quality outputs.

The successful candidate will have strong data scientist skills:

- Ability to code in Python and familiarity with Anaconda, MATLAB, or R (essential).
- Understanding of basic machine learning (or AI) assurance inclusive of the role of data quality (essential).
- Good skills in visual data representation (essential).
- Understanding and knowledge of standards in AI assurance and safety (desirable).

Internship Logistics

Start date: XX
Salary: £30,000 per annum pro rata
Internship duration: 3-6 months full-time (We regret that we are unable to consider part time applications)

Turing Internship Network

Location: Hybrid of remote working and on-site in Portsmouth area / Leighton Buzzard / London.
Security clearance: Candidates will need to obtain Baseline Personnel Security Standard (BPSS) clearance as a minimum. This will be sponsored by the contracting organisation.
Nationality: Prospective candidates must be <u>UK nationals</u>.

The successful candidate will be contracted by Digi2al Limited on behalf of the MoD.