Fujitsu Research of Europe
Assimilation for large-scale digital twins
TIN-FUJI-004

About the Organisation

Are you someone who enjoys using your research mindset to explore and innovate? Do you want to shape your world and change the way it works? Do you want to collaborate with committed people and achieve results together to develop truly human centric innovation? Are you someone who is interested in creating innovations to build trusted, sustainable societies using insights from big data, digital twins, and computational social science? If this is your world, here is an opportunity to shape it for the better.

At Fujitsu Research of Europe (FRE), we are combining research and industrial innovation to transform businesses and society. FRE is a multidisciplinary centre which, as part of Fujitsu's global R&D activity, conducts research and innovation – shaping our world for the better as well as supporting the constant learning of our employees.

About the Project

The Social Digital Twin project develops solutions to social issues. We create integrated technologies that combine large scale data with knowledge from a variety of fields, including data science, the humanities, and social sciences. We are developing systems that use real-world, real-time data to create digital twins that mirror the behaviour of complex systems – cities, transport, power – and enable their management.

One component of the SDT platform will be digital twins that reflect the state and behaviour of objects in the physical world. The models used by these twins will be continuously updated with real-time sensor data. These data will be noisy and gappy, so we need to ensure that they are smoothly integrated into running models.

We are creating an implementation of this concept by building a digital twin of the transport network of a region of the UK to manage the flow of people to meet sustainability goals. Input data includes open datasets, commercial data, and synthesised sources.

Smooth integration of data into running digital twins – assimilation - is a new and necessary area of research for the SDT project, so we are looking for an intern to help us start the investigation. The intern will set up a model flow of data from source to digital twin (of a transport system) and use this to implement and evaluate assimilation techniques on real-time data e.g Kalman filtering.

Further work may include reviewing the state of the art and/or the implementation of more sophisticated assimilation techniques.

Expected Outcomes

- Initial understanding of assimilation for the SDT
- Model implementation of data flow
- Present the results of the work to an international audience of stakeholders throughout Fujitsu Research
- Grow skills and expertise, both in yourself and for FRE

Person Specification

- Familiarity with one or more of: assimilation, agent-based modelling, or large-scale modelling
- Ability to discover and assess technical information
- Experience of performing well both when working as part of a team and individually

Internship Logistics

Start date: January/February 2023
Duration: 3 months full time equivalent (part-time possible)
Location: Hybrid, office in central Slough.
Renumeration: Renumeration: £30000 p.a. pro rata

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Please contact Sven Vandenberghe (sven.vandenberghe@fujitsu.com) for any technical enquiries.

Fujitsu Research of Europe
AI Ethics
TIN-FUJI-005

About the Organisation

Fujitsu is a world leading IT organisation with more than 125,000 people acting in 180 countries. As a global company with a long history of delivering technology-based value to customers, it is our responsibility to contribute proactively to the transformation of society. We are committed to focus all our resources on making the world more sustainable by building trust in society through innovation.

In order to deliver on our commitment, we need to connect people, communities, organizations, things and data, to deliver value that's focused around people and to generate innovation that solves societal challenges. Fujitsu Research is the global research arm of the Fujitsu Group and as such is responsible with creating the technology necessary to solve these challenges.

About the Project

AI ethics is increasingly important today as the use of AI technologies spreads all over the world. The main purpose of our project is to develop innovative technologies, and to demonstrate the need in business for AI ethics. In particular, we aim to create new AI ethics technologies such as AI fairness and accountability through applying the technologies to practical use cases.

Expected Outcomes

The expected outcome of this project is to develop an innovative technology for AI ethics. Working as part of Fujitsu's Global centre for AI Ethics, you will be responsible for:

- Algorithm design and prototype development of AI Ethics (Fairness aware, interpretable model monitoring, etc.)
- Evaluation results to show the effectiveness of the technology

Broad Objectives

- Read scientific literature and interact with experts in the fields, both internal and external, in order to generate a set of social/ethical challenges
- Use your core researcher skills to find efficient ways for solving the challenges

- Grow both your technical and communication skills by interacting frequently with your local and overseas colleagues

Person Specification

The successful candidate will have the following qualifications:

1. A demonstrated commitment to participating in a collaborative and empathetic community environment as extended to a team project
2. Proficiency and fluency with Python
3. Proficiency with scikit-learn
4. Familiarity with Tensorflow/PyTorch
5. Proficiency with statistics up to an undergraduate level
6. A demonstrable interest in understanding what it means to create a just digital future, and a drive to push actions towards the same

There are no educational qualifications mentioned in this job description as we are person-focussed instead of degree-focussed. We take the concept of skills-inclusivity very seriously in AI Ethics Team in FRE. If you think your values and goals align to ours, but you do not feel that you meet all the above points, please do apply.

Internship Logistics

Start Date: January 2023 (negotiable)
Duration: 3-6 months (negotiable), full time (part time possible)
Location: Hybrid working from our office in Slough.
Renumeration: £30,000 p/a pro rata