

## **EWADA Research Internship: privacy-preserving AI in Decentralized Personal Data Architectures**

The Human Centred Computing (HCC) Research Group (<http://hcc.cs.ox.ac.uk>) in Oxford's Computer Science Department is very excited to announce 3 summer internships in 2024!!!

Please come to join us if you want to create an AUTONOMOUS Web with a group of world-leading computer scientists!

### **Detailed job description**

You will be working as part of the Oxford Martin School programme EWADA (Ethical Web and Data Infrastructure in the Age of AI) [1]. Data driven algorithms are positively changing every aspect of our lives. However, from simple data aggregation algorithms for drawing collective insights to more advanced machine learning algorithms, all involve computations that are currently performed using centralised access to the users' data. This not only causes severe transparency and accountability challenges but also to individuals' data autonomy.

During the internship, you will be responsible for building scalable systems to perform privacy-preserving artificial intelligence (AI) computations in decentralized personal data architectures to contribute to the creation of a more ethical AI ecosystem [2]. Specifically, you will use the Solid (Social Linked Data) architecture [3], upon which to build such AI systems and algorithms. Interns will demonstrate the practical significance of their work in application use-cases and we have a range of application use-cases for the internship, including but not limited to:

- Personalised Recommender Systems
- Large Language Models like GPT
- Open (Health) Data
- Algorithmic Fairness and Transparency

### **Background of the project**

EWADA is an ambitious 3-year programme that aims to reform the concentration of power on the Web by developing and deploying new forms of technical and legal infrastructure. The project is led by Prof Sir Nigel Shadbolt and Prof Sir Tim Berner-Lee and aims to investigate novel re-decentralisation architectures and develop privacy-preserving AI methods to re-establish citizens' self-autonomy on the Web.

### **Selection criteria**

You must have hands-on programming experience, strong problem solving skills and a demonstrated passion for building large-scale systems and performing comprehensive empirical evaluation. Moreover, you will need to be able to work well with others, as these roles will be highly collaborative.

## Essential

- Fundamental understanding and hands-on experience with developing and testing usable systems, involving web technologies and machine learning.
- Proficiency in Python, JavaScript, web development and ability to work with Linux-based Operating Systems.
- The ability and desire to learn about Solid, to quickly acquire domain expertise needed for effectively developing new systems on top of Solid.
- The ability to communicate information clearly, including technical content.
- The ability to work independently and think creatively.
- The ability to effectively manage time, to complete projects efficiently.

## Desirable

- Experience with deep learning, APIs from HuggingFace and other platforms.
- Experience in privacy-friendly techniques like multi-party computation, homomorphic encryption, differential privacy, federated learning etc.
- Experience with distributed and decentralized systems.
- Experience with human-centred research and user-studies.
- Excellent writing and presentation skills.

## Application

The post is expected to be full-time (36.5 hours) for 12 weeks, starting mid-July 2024 and ending in early October 2024, £13.93 - £15.60 (Grade 3.8 - 4.7) per hour, depending on experience. If you are a student holding a Tier 4 visa, then you are permitted to work full-time for 8 weeks, plus 4 weeks part-time (max 20 hrs per week).

The post does not have to be based in Oxford but will be subject to the right to work in the UK. We CANNOT sponsor visa applications due to the short duration of the project.

Applications should be submitted to the Human Resources Department at [hr@cs.ox.ac.uk](mailto:hr@cs.ox.ac.uk) with a resume or CV. A short paragraph on your background, interests and motivation to apply will be helpful.

The subject of the email should be: "Internship Application for EWADA Research Internship: privacy-preserving AI in Decentralized Personal Data Architectures".

The closing date for applications is **noon on Friday 14<sup>th</sup> June 2024**. Candidates will be shortlisted and invited for an interview in late June.

[1] <https://www.oxfordmartin.ox.ac.uk/ethical-web-and-data-architectures/>

[2] Vizgirda et al. SocialGenPod: Privacy-Friendly Generative AI Social Web Applications with Decentralised Personal Data Stores. In WWW'2024. (<https://arxiv.org/abs/2403.10408>)

[3] <https://solidproject.org>