

## 2021-04045 - Engineer in transparent privacy-preserving AI: explanations

**Contract type :** Fixed-term contract  
**Renewable contract :** Oui  
**Level of qualifications required :** Graduate degree or equivalent  
**Fonction :** Temporary scientific engineer  
**Level of experience :** From 3 to 5 years

### About the research centre or Inria department

The Inria Lille - Nord Europe Research Centre was founded in 2008 and employs a staff of 320, including 280 scientists working in fourteen research teams. Recognised for its outstanding contribution to the socio-economic development of the Hauts-De-France région, the Inria Lille - Nord Europe Research Centre undertakes research in the field of computer science in collaboration with a range of academic, institutional and industrial partners.

The strategy of the Centre is to develop an internationally renowned centre of excellence with a significant impact on the City of Lille and its surrounding area. It works to achieve this by pursuing a range of ambitious research projects in such fields of computer science as the intelligence of data and adaptive software systems. Building on the synergies between research and industry, Inria is a major contributor to skills and technology transfer in the field of computer science.

### Context

This engineer position will be supported by the TIP project on Transparent artificial Intelligence preserving Privacy. This project will be jointly funded by I-Site, INRIA, U-Lille and MEL. This is a project in the MAGNET team (INRIA-Lille, <https://team.inria.fr/magnet/>).

While this position will be in the MAGNET team in Lille, we will collaborate with users (e.g. medical research groups in CHU-Lille) for the validation and exploitation of the work.

While AI techniques are becoming ever more powerful, there is a growing concern about potential risks and abuses. As a result, there has been an increasing interest in research directions such as privacy-preserving machine learning, explainable machine learning, fairness and data protection legislation.

Privacy-preserving machine learning aims at learning (and publishing or applying) a model from data while the data is not revealed. Notions such as (local) differential privacy and its generalizations allow to bound the amount of information revealed. Explainable machine learning aims at learning models which are not only accurate but also can be explained to humans.

The overall goal of the TIP project is to develop, exploit and explain a sound understanding of privacy-preserving strategies in larger AI-based processes involving massive numbers of agents among whom a part may be malicious.

Key challenges are related to the fact that we study applications from a holistic point of view (rather than individual operations in isolation), the need for transparency and explainability, and the need to consider more realistic assumptions than the popular honest-but-curious model.

To realize this project, a team of PhD students, post-docs, senior researchers and engineers will collaborate to perform the necessary research and develop a prototype. The successful candidate will be a member of this team. The TIP project team will collaborate with other members of the MAGNET group, e.g. engineers will collaborate with the ADT-Tailed project.

More project information will be posted at <http://researchers.lille.inria.fr/jramon/projects/tip.html>

### Assignment

The recruited engineers will collaborate with the TIP project researchers and the MAGNET team engineers and will develop parts of the project's open source library, which will also serve as a proof of concept of the research results.

We aim to recruit several engineers on the TIP project. This vacancy concerns a sub-project focusing on explanation, visualization and interacting with users.

### Main activities

- Development of prototypes of algorithms studied in the research and supporting software
- Contributing to an open source library containing new algorithms resulting from the research
- Collaborating with users to apply the developed tools in application domains

### Skills

Technical skills and level required :

- Software development skills, including knowledge of mobile device development.
- Knowledge of platform-independent frameworks for user interaction, e.g., Flutter/Darts.
- Parts of the project with which one will need to interface will be in python and/or C/C++.
- Software development collaboration skills (including the associated tools for versioning, continuous integration, testing, issue tracking, ...)
- Skills at interacting with users (e.g., explaining work performed, understanding requirements)

Languages :

### General Information

- **Theme/Domain :** Data and Knowledge Representation and Processing  
Software engineering (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** CRI Lille - Nord Europe
- **Starting date :** 2022-01-01
- **Duration of contract :** 1 year, 1 month
- **Deadline to apply :** 2021-12-15

### Contacts

- **Inria Team :** MAGNET
- **Recruiter :**  
Ramon Jan / [jan.ramon@inria.fr](mailto:jan.ramon@inria.fr)

### About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

### The keys to success

We are looking for a candidate with a strong background in computer science, with interest in the broad range of challenges typical for research projects.

Candidates should provide sufficient information to support their application, the page <https://team.inria.fr/magnet/how-to-apply/> lists the minimum information desired (which is more than what is strictly required by the online submission platform)

The development to which the engineers will contribute will include among others parts requiring (a) visualization techniques, (b) user interaction, (c) more declarative programming (for interpretability), (d) privacy and (e) communication, security and mobile device related modules. Good candidates should be proficient in several of these domains.

### Instruction to apply

#### Defence Security :

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

#### Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.

**Warning :** you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

- Mastering English is essential
- Knowledge of French may be a plus to more easily communicate with local users

Relational skills :

- smoothly working in a team in a reseach environment
- effective communication

## Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

## Remuneration

According to profile