
**Contract type :** Public service fixed-term contract  
**Level of qualifications required :** Graduate degree or equivalent  
**Fonction :** PhD Position  
**Level of experience :** Recently graduated

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**About the research centre or Inria department**

The Inria Lille – Nord Europe Research Centre was founded in 2008 and employs a staff of 360, including 300 scientists working in sixteen research teams. Recognised for its outstanding contribution the socio-economic development of the Nord - Pas-de-Calais Region, 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.

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**Context**

**Job environnements**  
This project will be carried out in the MAGNET Team at INRIA Lille and will be co-supervised by Jan Ramon and Aurélien Bellet. In particular, Jan Ramon did research in several areas of graph-based machine learning including learning theory, supervised learning algorithms, communicating learning agents and information optimization, while Aurélien Bellet is a machine learning specialist with some prior publications on distributed learning and decentralized gossip protocols.

This project will also stimulate existing and emerging collaborations with other research groups on themes at the intersection between machine learning, privacy, complex systems and cryptography. In particular, MAGNET has collaborations with the ASAP Team at INRIA Rennes (working on distributed systems) and the CIDRE Team (working on security and privacy) through the ANR Pamela. Magnet has also developed contacts with international partners in Europe and USA which can serve as possible student exchange during this PhD.

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**Assignment**

**Assignments**

The research work in the context of this Ph.D. project consists in developing a theoretical and algorithmic framework for privacy-friendly distributed machine learning, so that prediction tasks can be performed securely using the data of many users without storing personal data on a central server or disclosing them to other users. The candidate will work with Jan Ramon and Aurélien Bellet.

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**Main activities**

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- Analyze the problems related to privacy-friendly machine learning  
- Propose algorithms for decentralized privacy-preserving machine learning  
- Propose metrics and analysis methods for estimating privacy risks in a machine learning process  
- Propose techniques for making the algorithms more robust against failures and attacks.  
- Validate the proposed solutions

**Additional activities**

- Reporting, disseminating and presenting results  
- Coordinating with related efforts in the team / community

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**General Information**

- **Theme/Domain :** Data and Knowledge  
- **Representaton and Processing Statistics (Big data) (BAP E)**  
- **Town/city :** Villeneuve d'Ascq  
- **Inria Center :** CRI Lille - Nord Europe  
- **Starting date :** 2018-10-01  
- **Duration of contract :** 3 years  
- **Deadline to apply :** 2018-05-02

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**Contacts**

- **Inria Team :** MAGNET  
- **Recruiter :** Ramon Jan / jan.ramon@inria.fr

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**The keys to success**

A successful candidate will

- Collaborate in the team and where applicable with external researchers and engineers  
- Organize work efficiently and make a good balance between the several priorities  
- Report regularly

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**Conditions for application**

**Instructions to apply:**

Candidates will be treated firstly with a complete file : CV + letter of motivation + one or more letters of recommendation + transcripts from previous years.

**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.

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**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.
**Skills**

A good candidate will have the following skills:

- A good command of English
- A strong background in mathematics
- A good knowledge of machine learning, statistics and algorithms
- Preferably some knowledge on distributed systems and cryptography
- Some experience with implementation and experimentation

**Benefits package**

Benefits

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Sports facilities
- Flexible working hours

More information about Lille:

http://www.lille3000.eu/portail/

http://www.lillemetropole.fr/mel.html

**Remuneration**

Remunerating

The gross monthly salary is 1982€ for the 1st and the 2nd year, 2085€ for the 3rd year.