HR EXCELLENCE IN RESEARCH

2021-04034 - Post-Doctoral Research Visit F/M Privacy in machine learning for speech processing M/F

Contract type : Fixed-term contract
Level of qualifications required : PhD or equivalent
Fonction : Post-Doctoral Research Visit

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

Inria Lille is seeking a postdoctoral researcher for an ANR collaborative project called DEEP-Privacy. The successful candidate will be part of the Magnet team, but will work in a tight collaboration with the Multispeech team in Nancy, and participate in meetings with LIUM in Le Mans and LIA in Avignon. Magnet gathers 15 researchers (faculty, postdocs, PhD students) in the field of machine learning, with focus on learning from graph-structured data as well as decentralized and privacy-friendly algorithms.

Magnet is very international and English is the working language.

Assignment

The postdoctoral researcher will work on the notion of privacy in machine learning algorithms for speech processing. More particularly we are interested in learning automatic speech recognition systems (ASR) from speech representations that tend to hide speaker identity. Additional requirements such as decentralized learning, gender fairness, or data efficiency may be considered.. Depending on her/his profile, he/she will address the following research questions:

- how to design privacy attacks on ASR and design counter-measures;
- how to learn private representations of speech from adversarial training with many attackers;
- how to design fair and private speech representations;
- how to adapt such methods in the decentralized setting (e.g. federated or fully decentralized learning);
- how to formally define and measure the trade-off between accuracy, fairness, or privacy at the global and individual levels;

This research has also an important part dedicated to empirical evaluation of the proposed methods that will be conducted in in tight collaboration with the other teams at Inria Nancy, Avignon or Le Mans.

Main activities

- Review works and their applicability in the context of the project's requirements
- Design new training algorithms following project objectives
- Assess expected properties of the proposed algorithms in a formal way
- Validate the proposed solutions on real data

Additional activities

- Publish, report, and disseminate results
- Coordinate with related efforts in the team / community

Skills

- Excellent background in machine learning, statistics and algorithms and/or
- Excellent knowledge of ASR systems,
- Excellent English writing and speaking skills.

Benefits package

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

Remuneration

General Information

- **Theme/Domain :** Optimization, machine learning and statistical methods
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** CRI Lille - Nord Europe
- **Starting date :** 2021-11-01
- **Duration of contract :** 1 year, 8 months
- **Deadline to apply :** 2021-10-22

Contacts

- **Inria Team :** MAGNET
- **Recruiter :**
  Tommasi Marc / Marc.Tommasi@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.

Instruction to apply

CV + application letter + recommendation letter(s) + List of publications

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.

Gross monthly salary (before taxes) : 2653 €