



## HR EXCELLENCE IN RESEARCH

### 2020-03209 - Post-Doctoral Research Visit F/M Causal explanations in reinforcement learning

Type de contrat : Mobilité ou CDD

Niveau de diplôme exigé : Thèse ou équivalent

Fonction : Post-Doctorant

Niveau d'expérience souhaité : Jusqu'à 3 ans

#### A propos du centre ou de la direction fonctionnelle

The Inria Lille - Nord Europe Research Center was founded in 2008 and employs a staff of 360, including 300 scientists working in sixteen research teams. Recognised for its outstanding contribution to the socio-economic development of the Hauts-De-France région, the Inria Lille - Nord Europe Research Center undertakes research in the field of computer science in collaboration with a range of academic, institutional and industrial partners.

The strategy of the Center 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.

#### Contexte et atouts du poste

Project CausalXRL is a publicly funded collaborative project research problem. CausalXRL is gathering the dept. of computer science of U. Sheffield, the faculty of computer science of U. Vienna, and Inria/Scool team.

The recruitee will be based in Scool group, in Villeneuve d'Ascq in France. As part of the project, he/she will regularly travel and meet people in Sheffield and Vienna. He/She will also participate to scientific events, such as scientific conferences.

Reinforcement learning is today a well developed field of research, enjoying significant applications. Its most well-known applications are related to learning to play games and become expert in playing Backgammon (1994), Atari video-games (2013), and go and other board games (2017). However spectacular, RL successes have been obtained in applications in which a the environment may be simulated, and the agent may be trained over billions of trials, sometimes over months, on large scale computing infrastructures for the most recent ones. When one departs from these comfortable applications, RL faces many challenges. Among others, RL faces the challenge also faced by other deep learning applications, that of being able to explain what it does, or to provide human beings with information about what it does and how it achieves its prediction. This is the well-known "explainability" challenge. In the CausalXRL project, we wish to investigate the use of causality to let an RL be able to explain what it does, or let human beings understand how and why it performs.

#### Mission confiée

The recruitee will collaborate with the project partner groups for the purpose of making scientific progress in the field of causal explainable reinforcement learning, fundamental research and its application.

#### Principales activités

The recruitee will perform standard research activities, involving reading scientific publications, proposing new ideas related to the project, arguing, developing them, presenting them informally to partners, and also through seminars and research group meetings, writing scientific publications and submit them to top conference and journals of the field.

#### Compétences

Technical skills and level required: proficiency in python, pytorch, machine learning packages. Skills in C/C++ will also be appreciated.

Everything will be implemented in Linux/Ubuntu, in an open source software state of mind.

Ability to work, interact, and collaborate with other researchers (in English)

#### Avantages

- 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

## Rémunération

Depending on profile and experience, between 35 k€ and 43 k€ gross per year

## Informations générales

- **Thème/Domaine** : Optimisation, apprentissage et méthodes statistiques  
Statistiques (Big data) (BAP E)
- **Ville** : Villeneuve d'Ascq
- **Centre Inria** : [CRI Lille - Nord Europe](#)
- **Date de prise de fonction souhaitée** : 2021-07-01
- **Durée de contrat** : 3 ans
- **Date limite pour postuler** : 2021-05-31

## Contacts

- **Equipe Inria** : [SCOOL](#)
- **Recruteur** :  
Preux Philippe / [Philippe.Preux@inria.fr](mailto:Philippe.Preux@inria.fr)

## A propos d'Inria

Inria est l'institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 200 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3500 scientifiques pour relever les défis du numérique, souvent à l'interface d'autres disciplines. L'institut fait appel à de nombreux talents dans plus d'une quarantaine de métiers différents. 900 personnels d'appui à la recherche et à l'innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 180 start-up. L'institut s'efforce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

## L'essentiel pour réussir

You want to push forward the limits of knowledge in the field of explainable reinforcement learning.

You are hard working, dedicated to your research.

You love working on fundamental ideas and demonstrating them experimentally, and then reporting your work in well-polished publications.

You really enjoy working with other researchers, sharing and discussing ideas.

You are rigorous, serious and reliable in your work.

## Consignes pour postuler

Application deadline: 31/05/2021

### Sécurité défense :

Ce poste est susceptible d'être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L'autorisation d'accès à une zone est délivrée par le chef d'établissement, après avis ministériel favorable, tel que défini dans l'arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l'annulation du recrutement.

### Politique de recrutement :

Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.

**Attention**: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.