A key difficulty to design a solution for these problems is that typically, when a decision is made, one only gets to see a noisy effect of that decision, and little about the effect of other alternatives. This gives rise to the study of the fundamental exploration-exploitation trade-off: Shall we follow a method that can, from partial observations and sequential interactions with a complex system, learn an optimal behavior.

A solid mathematical background, specifically in mathematical statistics and/or optimization, information theory, and machine learning.

Required Diploma and experience: A Ph.D. in Machine Learning or Applied Mathematics, and an expertise in Reinforcement Learning (Bandits, Markov Decision Processes, etc.) and Mathematical statistics.

Conditions pour postuler

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.
environment, and the often partially hidden structure of the environment generating the observation signal.

All travel expenses are covered within the limits of the scale in force.

**Mission confiée**

**Assignments**
The objective of this postdoctoral position, under the direct supervision of Odalric-Ambrym Maillard, is to study and develop novel decision-making strategies to handle the possibly unknown structure of the signals in the context of sequential prediction and reinforcement learning. Specific emphasis will be given to the notion of structure in BAnDits and to strategies designed for Markov Decision Processes with average gain criterion.

The proposed strategies will be developed with a generic application purpose and thus be given theoretically grounded performance guarantees under application-friendly assumptions.

**For a better knowledge of the proposed research subject:**
Please send an email to odalric.maillard@inria.fr, and visit the page of the team SequeL https://team.inria.fr/sequel/, or the Badass project https://project.inria.fr/badass/

**Collaboration**
The successful candidate is expected to interact with the researchers in the sequel team and to strengthen his/her network of external collaborators.

**Responsibilities**
The successful candidate will work along different work packages of the ANR project, especially the ones related to structure. He or she will also be encouraged to participate in the organization of a workshop or a tutorial as well.

**Steering/Management**
The person recruited will be in charge of strengthening his or her publication record with novel and strong research articles, in order to get a good position in either academia or the industry.

**Principales activités**
The successful candidate will be part of an ambitious research program, at the frontier of mathematical statistics, information theory and machine learning for sequential decision making focusing on reinforcement learning.

The standard activities of a Postdoctoral fellow include publishing research articles in top conferences or journals of the fields, communicating actively with other members of the team, strengthen his/her network of collaborators, and try novel and disruptive ideas. Meanwhile, the candidate will have the opportunity to enjoy the very beautiful, alive and welcoming city of Lille, as well as top working conditions for doing research in France.

**Compétences**
Technical skills and level required: PhD in a field related to Machine Learning and/or Reinforcement Learning

Languages: fluent in English.

**Avantages sociaux**
- Subsidised catering service
- Partially-reimbursed public transport

**Rémunération**
With a fixed term contract in the public administration, the salary will be 31836€ gross per year.