2018-00226 - Post-doc / Learning adaptive reflexes for autonomous cars

**Level of qualifications required**: PhD or equivalent

**Function**: Post-Doctoral Research Visit

**Level of experience**: From 3 to 5 years

### About Inria

Inria, the French National Institute for computer science and applied mathematics, promotes “scientific excellence for technology transfer and society”. Graduates from the world’s top universities, Inria’s 2,700 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

### Context

This post-doc is part of a large international project with partners in the US and in Europe. The overall objective of this project is to develop novel approaches for lifelong learning by combining ideas from neuro-evolution and neural plasticity. The use-case is autonomous driving (mainly in simulation).

The selected applicant will need to travel to the US about four times a year for the meetings (travel expenses are covered within the limits of Inria's rules).

Our research group is at the intersection of machine learning, evolutionary computation, and robotics. For a few examples of recent work, please see [https://www.resibots.eu](https://www.resibots.eu) and [https://members.loria.fr/JBMouret](https://members.loria.fr/JBMouret)

### Assignment

The post-doc will extend the “Intelligent Trial & Error algorithm” [1,2] to evolve (potentially plastic) neural networks [3] so that autonomous cars can react to unexpected situations. The work will be mostly in simulation, although we might consider testing the algorithms on mobile robots.


### Main activities

**Main activities:**

- Develop novel algorithms
- Evaluate algorithms in simulation
- Write scientific papers
- Write the monthly reports of the project
- Attend the meetings of the project
**Skills**

**Required skills**

- Knowledge of the state-of-the-art in evolutionary computation
- Although we do not develop deep learning methods, basic knowledge of the state-of-the-art in deep learning
- Good programming skills in modern C++ or Python

The official language of the team is English and all the interactions with the other partners will be in English: fluent English is required.

**Benefits package**

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

**Remuneration**

Gross salary / months: 2653 euros

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**General Information**

- **Theme/Domain**: Robotics and Smart environments
- **Town/city**: Villers-lès-Nancy
- **Inria Center**: CRI Nancy - Grand Est
- **Starting date**: 3/1/18
- **Duration of contract**: 2 years
- **Deadline to apply**: 2/28/18

**Contacts**

- **Inria Team**: LARSEN
- **Recruiter**: Mouret Jean-baptiste / jean-baptiste.mouret@inria.fr

**The keys to success**

A successful post-doc applicant should have a strong robotics, evolutionary computation and/or machine learning background with a track record of top-tier research publications, including relevant conferences (e.g., GECCO, CEC, RSS, ICRA, IROS, ICML, IJCAI, AAAI) and journals (e.g., ECJ, TEC, AURO, TRo, IJRR, JMLR, MLJ, Neural Computation, RAS).

**Conditions for application**

**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.