2018-00385 - Developping a wheel-leg hybrid robot

Contract type: Internship agreement
Level of qualifications required: Master's or equivalent
Function: Internship Research

Context
Our team works on new machine learning algorithms to allow robots to adapt to unexpected situations. For instance, we seek to make a hexapod robot that broke a leg re-learn to walk in a few minutes. We recently obtained promising results (see [1] and [2]).


Assignment
We now wish to extend the adaptation possibilities by making our approach work on an hybrid wheel-legs robot, that is to say a robot capable of both walking and driving (see [3]). To do so, a new gait controller has to be designed and our learning algorithms have to be adapted.


Main activities
The objective of this internship is:

1. improve the existing wheel-legs platform (hardware and software);
2. adapt the walking and learning algorithms to use the wheels;
3. extend the current hexapod simulator to handle wheels.

The position is for at least 5 months and, due to the French law, available only to students.

We aim at experimenting on the robots as much as possible. In case of blocking hardware issue, the work could be done in simulation.

Skills
Depending on the selected candidate, the internship can be more focused on the mechatronics side or the machine learning side. Nonetheless, basic skills are wished in:

- C++ programming,
- Python programming,
- use of ROS,
- basic CAD (we use SolidWorks or OpenSCAD),
- (optional) machine learning,

It is expected that the candidate be proficient in English, or in French.

Benefits package
- Subsidised catering service
- Partially-reimbursed public transport

**Remuneration**
Gratification : environ 500 € par mois

**General Information**
- **Theme/Domain** : Robotics and Smart environments
  Scientific computing (BAP E)
- **Town/city** : Villers-lès-Nancy
- **Inria Center** : CRI Nancy - Grand Est
- **Starting date** : 2018-03-15
- **Duration of contract** : 5 months
- **Deadline to apply** : 2018-04-15

**Contacts**
- **Inria Team** : LARSEN
- **Recruiter** :
  Goepp Dorian / dorian.goepp@inria.fr

**The keys to success**
The ideal candidate is multi-skilled and wants to work with robots.

**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.