2018-00986 - Consistent Discretisation of Homogeneous Control Systems (h/f)

**Contract type:** Public service 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 360, including 300 scientists working in sixteen research teams. Recognised for its outstanding contribution to the socio-economic development of the Nord - Pas-de-Calais Region, 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

This position is opened within the framework of a partnership with French National Research Agency (ANR), project DIGITSLID. The objective is to develop algorithms of consistent discretization and digital implementation of homogeneous control systems.

### Assignment

**Assignments:**
With the help of Andrey Polyakov (http://researchers.lille.inria.fr/~polyakov/), the recruited person will be taken to develop consistent discretization schemes for high order sliding mode algorithms.

**For a better knowledge of the proposed research subject:**
A state of the art, bibliography and scientific references are:

- A. Polyakov, D. Efimov, B. Brogliato, Consistent discretization of finite-time stable homogeneous systems, Proc. of VSS 2018 (https://hal.inria.fr/hal-01794386v1)
- D. Efimov, A. Polyakov, A. Levant, W. Perruquetti, Realization and Discretization of Asymptotically Stable Homogeneous Systems, IEEE TAC, 2018 (https://hal.inria.fr/hal-01514350v1)

**Collaboration:**
The recruited person will be in connection with other partners of ANR DIGITSLID (form Inria Grenoble and CNRS LS2N) for some theoretical developments and practical application of the results.

**Responsibilities:**
The person recruited will be responsible for a development of discretization algorithms for homogeneous sliding mode control systems and testing of these algorithms on experimental setups available in Inria Lille and CNRS LS2N.

### Main activities

**Main activities:**

- Development of discretization algorithms
- Practical implementation of control algorithms on experimental platforms
- Writing articles and reports
- Presentation of the scientific results and the works’ progress to the partners

### Skills

**Technical skills and level required:**
The knowledge of homogeneous control systems and methods of discretization of continuous-time ODE models are welcomed. An applicant must be familiar with MATLAB and LaTeX.

**Languages:**
Good knowledge of English is necessary.

### Benefits package

- Subsidised catering service
- Partially-reimbursed public transport

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### 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.

### The keys to success

An applicant must have a PhD degree in Engineering or Applied Mathematics with a specialization in Control Theory.

The knowledge of homogeneous control systems and methods of discretization of continuous-time ODE models are welcomed.

### 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.
Remuneration
Gross monthly salary: 2653 euros