



## Offer #2024-07697

### Research Intern

**Contract type** : Internship

**Level of qualifications required** : Graduate degree or equivalent

**Fonction** : Internship Research

### About the research centre or Inria department

The Inria Saclay-Île-de-France Research Centre was established in 2008. It has developed as part of the Saclay site in partnership with **Paris-Saclay University** and with the **Institut Polytechnique de Paris**.

The centre has [40 project teams](#), 32 of which operate jointly with Paris-Saclay University and the Institut Polytechnique de Paris; Its activities occupy over 600 people, scientists and research and innovation support staff, including 44 different nationalities.

### Assignment

With the help of Etienne Boursier, the recruited intern will study the theory of two-layer ReLU neural networks. In particular, the intern should focus on the impact of the stochasticity due to the use of SGD on the training dynamics.

### Main activities

Main activities:

- establish a bibliographical state of the art
- run numerical experiments (Python, pytorch) for neural networks on toy examples
- mathematical proofs and arguments, using mostly non-convex optimization and SDEs tools

### Skills

Neural networks theory

Reading scientific articles

Coding (Python, pytorch)

Non-convex optimization

Stochastic differential equations

### General Information

- **Theme/Domain** : Optimization, machine learning and statistical methods  
Statistics (Big data) (BAP E)
- **Town/city** : ORSAY
- **Inria Center** : [Centre Inria de Saclay](#)
- **Starting date** : 2024-08-26
- **Duration of contract** : 6 months
- **Deadline to apply** : 2024-08-01

### Contacts

- **Inria Team** : [CELESTE](#)
- **Recruiter** :  
Boursier Etienne / [etienne.boursier@inria.fr](mailto:etienne.boursier@inria.fr)

### About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the

interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

**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.

## Instruction to apply

### **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.