2023-06000 - Post-Doctoral Research Visit F/M Online Majorization-Minimization Algorithms

Contract type: Fixed-term contract
Level of qualifications required: PhD or equivalent
Function: Post-Doctoral Research Visit
Level of experience: Recently graduated

Context
In the context of the ERC STG MAJORIS European project, our aim is to investigate the construction and the convergence analysis of majorization-minimization algorithms when some terms (e.g., gradient, curvature) involved in the majorizing function are approximated, typically through a mini-batch strategy. Motivating examples and datasets arising from the field of supervised learning will be considered.

Assignment
Missions: The recruited student will investigate new online MM optimization schemes for continuous optimization. The main challenges are: convergence analysis, convergence rate study, practical implementation on problems arising in machine learning.

Environment: The post-doctoral fellow will work under the guidance of Emile Chouzenoux (Inria Saclay, PI of the ERC project MAJORIS). He/she will join the Inria Saclay team OPIS (https://opis-inria.eu/). He/she will be located in the Centre de la Vision Numérique, in CentraleSupélec campus, Saclay, France. He/she will enjoy an international and creative environment where research seminars and reading groups take place very often.

Travel and informatic material expenses will be covered within the limits of the scale in force.

Main activities
- Bibliographic study
- Algorithmic design
- Convergence analysis
- Implementation of the methods in Python or Matlab softwares
- Validation on numerical examples
- Writing of scientific reports

Benefits package
- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

General Information
- Theme/Domain: Optimization, machine learning and statistical methods
- Statistics (Big data) (BAP E)
- Town/city: Gif sur Yvette
- Inria Center: Centre Inria de Saclay
- Starting date: 2023-09-01
- Duration of contract: 1 year
- Deadline to apply: 2023-09-30

Contacts
- Inria Team: OPIS
- Recruiter: Chouzenoux Emile / emilie.chouzenoux@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.

The keys to success
We are looking for a motivated and talented student with a PhD in applied mathematics in optimization / machine learning.

- The student must have strong mathematical skills, with a solid background in optimization, including an experience in convergence analysis.
- An experience in programming, in Matlab and/or Python is required.
- The candidates are requested to send a CV, a motivation letter, and two recommendation letters, to apply for this position.

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.
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.