Offer #2025-09208

Post-Doctoral Research Visit F/M Levels Merging in the Latent Class Model

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

About the research centre or Inria department

Created in 2008, the Inria center at the University of Lille employs 360 people, including 305 scientists in 15 research teams. Recognized for its strong involvement in the socio-economic development of the Hauts-De-France region, the Inria center at the University of Lille maintains a close relationship with large companies and SMEs. By fostering synergies between researchers and industry, Inria contributes to the transfer of skills and expertise in the field of digital technologies, and provides access to the best of European and international research for the benefit of innovation and businesses, particularly in the region.

For over 10 years, the Inria center at the University of Lille has been at the heart of Lille's university and scientific ecosystem, as well as at the heart of Frenchtech, with a technology showroom based on avenue de Bretagne in Lille, on the EuraTechnologies site of economic excellence dedicated to information and communication technologies (ICT).

Context

This post-doc position will hold within the framework of a partnership of 2 Inria teams specialized in statistics and machine learning: MODAL/DATAVERS in Lille and CELESTE in Saclay.

The hosted research team will be MODAL/DATAVERS in Lille. Some travels are planed between the two teams for several specific working groups.

The new DATAVERS Inria team is a very recent spin-off of the MODAL team, involving now a strong partnership with a multidisciplinary research team in Public Health. By this way, the methological part of this post-doc activity will be experimentally validated on real data sets coming directly from the medical context.

Assignment

The research topic concerns the latent class model (LCM), dedicated to cluster categorical variables, when the number of levels is large, situation frequently encountered in practice. A recent work proposes to extent LCM to a natural modeling which limits the number of levels by merging them, process which is also equivalent to a specific levels clustering.

A description of this seminal work, including also state of the art, bibliography and scientific references are available at the following URL, pages 719-724 :

https://it.pearson.com/content/dam/region-core/italy/pearson-italy/pdf/Docenti/Università/bozza-book-compresso-new1.pdf

The main research tasks will be twofold: (1) developping a strategy for efficiently explore the combinatorial space of merging levels and (2) to apply this strategy on real medical data sets suffering from a large number of levels.

Main activities

Main activities:

- Innovative methodology for efficient merging levels
- Model implementation (R or Python) though a dedicated package
- Numerical evaluation of the model on medical data
- Publication in a statistical or a machine learning international journal

Skills

Technical skills and level required : solid skills in mixture models and related estimation algorithms

Languages : solid skills in R and/or Python

Relational skills : excellent interpersonal skills

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 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

Remuneration

2 788 € monthly gross salary

General Information

- **Theme/Domain :** Optimization, machine learning and statistical methods Statistics (Big data) (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** Centre Inria de l'Université de Lille
- **Starting date :** 2025-12-01
- **Duration of contract :** 12 months
- **Deadline to apply :** 2025-08-23

Contacts

- **Inria Team :** MODAL
- **Recruiter :**
  Biernacki Christophe / Christophe.Biernacki@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

- Like to propose and experiment new ideas of research independently
- Ability to exchange at a cross-disciplinary level for the experimental part

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

Please send your CV and cover letter

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.