



Offer #2024-07274

PhD Position F/M [Campagne DOC BMI-NF-GRA-2024] Measure of extreme inequality in wealth distribution

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : PhD Position

About the research centre or Inria department

The Centre Inria de l'Université de Grenoble groups together almost 600 people in 22 research teams and 7 research support departments.

Staff is present on three campuses in Grenoble, in close collaboration with other research and higher education institutions (Université Grenoble Alpes, CNRS, CEA, INRAE, ...), but also with key economic players in the area.

The Centre Inria de l'Université Grenoble Alpes is active in the fields of high-performance computing, verification and embedded systems, modeling of the environment at multiple levels, and data science and artificial intelligence. The center is a top-level scientific institute with an extensive network of international collaborations in Europe and the rest of the world.

Assignment

The richest 1% on the planet own almost half of the world's wealth, according to a study by Oxfam International published in 2021. This marked inequality in the distribution of wealth is of major interest for the global economy. In 1912, Italian economist Corrado Gini introduced the first measure of inequality, the Gini coefficient. This statistical index is used to account for the variability of a variable within a population. It thus makes it possible to quantify the level of inequality in the distribution of wealth in a population. The Gini coefficient is a number ranging from 0 to 1, where 0 means perfect equality (everyone has the same share of wealth) and 1 represents perfect inequality (one person has all the wealth). However, it turns out that if the focus is on the distribution of wealth among the highest income earners, the Gini coefficient underestimates inequality. Indeed, if the variable of interest follows a heavy-tailed distribution (with possibly infinite variance), then it has the same Gini index as a light-tailed distribution. The Gini coefficient is therefore robust to extreme observations and fails to discriminate between two different distributions of wealth for extreme values.

Main activities

The objectives are as follows:

- To define and theoretically study a new coefficient for measuring inequalities in the distribution of wealth, dedicated to extreme values. This will enable to take better account of the behavior of the tail of the distribution and to better discriminate the distribution of great wealth by no longer underestimating inequalities.
- Implement the estimation of this new index, apply it to economic data, where it will be compared with other existing measures of inequality.

Skills

We look for candidates strongly motivated by challenging statistical research with application to real world data. The applicant should have a solid background in probability and statistics. He/she will also ideally have experience in extreme value analysis. The applicant will have significant experience in programming with either C/C++, Matlab, Python or R.

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 (90 days / year) and flexible organization of working hours (except for internship)
- Social, cultural and sports events and activities

- Access to vocational training
- Social security coverage under conditions

Remuneration

1st and 2nd year: 2 100 euros gross salary /month

3rd year: 2 190 euros gross salary / month

General Information

- **Theme/Domain :** Optimization, machine learning and statistical methods Statistics (Big data) (BAP E)
- **Town/city :** Montbonnot
- **Inria Center :** [Centre Inria de l'Université Grenoble Alpes](#)
- **Starting date :** 2024-10-01
- **Duration of contract :** 3 years
- **Deadline to apply :** 2024-04-30

Contacts

- **Inria Team :** [STATIFY](#)
- **PhD Supervisor :**
Girard Stephane / stephane.girard@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

CV, cover letter, Master's grades, a letter of recommendation from the Master's course supervisor (or equivalent), possibly a letter of recommendation from the master's supervisor.

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.