2018-00705 - Study of the links between Nutrition and Health

Contract type : Public service fixed-term contract
Level of qualifications required : PhD or equivalent
Function : Post-Doctoral Research Visit
Level of experience : From 5 to 12 years

About the research centre or Inria department

Located at the heart of the main national research and higher education cluster, member of the Université Paris Saclay, a major actor in the French Investments for the Future Programme (Idex, LabEx, IRT, Equipex) and partner of the main establishments present on the plateau, the centre is particularly active in three major areas: data and knowledge; safety, security and reliability; modelling, simulation and optimisation (with priority given to energy).

The 450 researchers and engineers from Inria and its partners who work in the research centre’s 31 teams, the 100 research support staff members, the high-level equipment at their disposal (image walls, high-performance computing clusters, sensor networks), and the privileged relationships with prestigious industrial partners, all make Inria Saclay Île-de-France a key research centre in the local landscape and one that is oriented towards Europe and the world.

Context

The Nutriperso IRS project at Univ. Paris-Saclay is concerned with the individual relationships between nutrition, health and socio-demographic features. The study considers a wealth of proprietary data, reporting the daily food purchases for 20,000 households over 20 years. The challenge is the following. A coarse description of the food items (e.g. their composition in terms of proteins, carbohydrates and lipids) is notoriously insufficient to capture their impact on health. For instance, there exist about 380 different pizza references available on the food market; their impact on health widely varies, e.g. depending on how highly processed they are, involving pre-cooked ingredients, etc.

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Assignment

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The proposed machine learning-based approach takes inspiration from natural language processing: a diet involves some food items selected among a great variety of items, like a document is made of some words selected in a large-size vocabulary. Like documents can be analyzed as related to a mixture of topics – e.g., sport, theater, politics – we aim to identify the general "topics" or diet themes – e.g., Mediterranean diet, French-South-West diet, American diet – represented in the data. Approaches based on continuous language models (word embeddings) or Restricted Boltzmann Machines might be considered.

General Information

- Theme/Domain : Optimization, machine learning and statistical methods
- Statistics (Big data) (BAP E)
- Town/city : PALAISEAU
- Inria Center : CRI Saclay - Île-de-France
- Starting date : 2018-06-01
- Duration of contract : 12 months
- Deadline to apply : 2018-05-31

Contacts

- Inria Team : TAU (DGD-S)
- Recruiter : Schoenauer Marc / marc.schoenauer@inria.fr

The keys to success

Candidates with expertise in machine learning, or data analysis, or statistics, or in social sciences with a preliminary experience in machine learning (in particular sk-learn suite), are encouraged to apply.

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
Main activities
The proprietary data include:

i) the description of the households (e.g., number of persons, age, education, revenue, urban/rural);

ii) the description of the food products, with an unprecedented level of detail (180,000 items);

iii) the purchases (per week, list of items bought by each household). The goal is to identify the general "diet topics" and characterize the mixture of diets specific to each household.

Ultimately, these characterizations will be interpreted in relation with the structure of the household (presence of young children, retired people) and the people body mass index. The long-term goal of the study is to investigate the existence of causal relationships between the household, health and nutrition features.

Skills
Candidates with expertise in machine learning, or data analysis, or statistics, or in social sciences with a preliminary experience in machine learning (in particular sk-learn suite), are encouraged to apply.

Benefits package
- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
- Sports facilities

Remuneration
Monthly gross salary : 2.653 euros/month