2018-00705 - Etude des liens entre nutrition et santé

Type de contrat : CDD de la fonction publique
Niveau de diplôme exigé : Thèse ou équivalent
Fonction : Post-Doctorant
Niveau d'expérience souhaité : De 5 à 12 ans

A propos du centre ou de la direction fonctionnelle
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.

Contexte et atouts du poste
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.

It is therefore extremely important to consider the food items with the greatest level of detail available, which requires to go beyond the standard statistical approaches used in nutrition studies.

Mission confiée
It is therefore extremely important to consider the food items with the greatest level of detail available, which requires to go beyond the standard statistical approaches used in nutrition studies.

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 Boltzman Machines might be considered.

Informations générales
- Thème/Domaine : Optimisation, apprentissage et méthodes statistiques
- Statistiques (Big data) (BAP E)
- Ville : PALAISEAU
- Centre Inria : CRI Saclay - Île-de-France
- Date de prise de fonction souhaitée : 01-06-2018
- Durée de contrat : 12 mois
- Date limite pour postuler : 31-05-2018

Contacts
- Équipe Inria : TAU (DGD-S)
- Recruteur : Schoenauer Marc / marc.schoenauer@inria.fr

L'essentiel pour réussir
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 pour postuler
Sécurité défense :
Ce poste est susceptible d’être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L’autorisation d’accès à une zone est délivrée par le chef d’établissement, après avis ministériel favorable, tel que défini dans l’arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l’annulation du recrutement.

Politique de recrutement :
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.

Attention : Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.
**Principales activités**

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.

**Compétences**

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.

**Avantages sociaux**

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

**Rémunération**

Monthly gross salary: 2,653 euros/month