Offer #2019-02123

Research Engineer F/M Analysis of traces of mathematical learning and prediction

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Other valued qualifications : PhD

Fonction : Temporary scientific engineer

Level of experience : From 3 to 5 years

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 34 research teams as well as 8 support departments. The center's staff (about 500 people including 320 Inria employees) is made up of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrative staff. 1/3 of the staff are civil servants, the others are contractual agents. The majority of the center's research teams are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Four teams are based in Montpellier and two teams are hosted in Bologna in Italy and Athens. The Center is a founding member of Université Côte d'Azur and partner of the I-site MUSE supported by the University of Montpellier.

Context

We are looking for a research engineer with a background in Semantic Web, Graph-based Knowledge Representation and Reasoning, Automatic classification, Recommender Systems to join the Inria Wimmics team to work within the **collaborative project funded by the Ministry of National Education (MEN) as part of the PI IA market** (https://eduscol.education.fr/cid118880/partenariat-d-innovation-et-ia.html).

This project is a follow-up to the joint EduMICS laboratory between Inria's Wimmics team and Educlever, where we developed a knowledge graph based on data from the Educlever learning platform, which integrates the pedagogical resources of the Educlever platform, including training exercises, their indexing to a thesaurus of knowledge and skills, and the learning traces of the platform's users, including their success or failure in exercises. We have shown how to implement the existing platform's functionalities with semantic queries on this knowledge graph and how to develop new functionnalities that exploit these new possibilities of representation and reasoning.

As part of the present project funded by the PI IA of the MEN, we wish to develop bricks for adaptive learning on the Educlever platform. To do this, we want to explore the possibilities of using the existing Educlever knowledge graph to adapt the learning to the user's profile and context. A first step will be to predict the learner's success in an exercise based on his or her profile and learning context. Ultimately, we aim to produce personalized recommendations of exercises, taking into account the learner's profile and context.

Assignment

The recruited person will be in charge of developing innovative prediction methods and algorithms based on the knowledge graph extracted from the Educlever platform. He or she will participate in the project monitoring and meetings with partners.

Main activities

The recruited person will focus on the following research questions:

- Which features should be selected from the Educlever knowldge graph to best predict the learner success to an exercice?
- Which machine learning algorithm should be selected for the prediction?
- How should the system recommand adapted exercises based on the prediction of learner's success in the exercises?
- How does the exploitation of Semantic Web models enable to improve the resource recommendation process?

Experiments will be designed in collaboration with the project partners in order to evaluate the proposed methods and algorithms.

Skills

Important skills are:

- Knowledge of Semantic Web models and techniques
- Experience on Graph-based Knowledge Representation and Reasoning
- Experience in using Machine Learning libraries for classification tasks
- Experience in using or designing Recommender systems
- Interest for the domain of eEducation
- Fluent English and/or French

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

Remuneration

From 2632 euros gross monthly (according to degree and experience)

General Information

- **Theme/Domain** : Data and Knowledge Representation and Processing Information system (BAP E)
- **Town/city** : Sophia Antipolis
- **Inria Center** : Centre Inria d'Université Côte d'Azur
- **Starting date** : 2019-11-01
- **Duration of contract** : 12 months
- **Deadline to apply** : 2020-01-24

Contacts

- **Inria Team** : WIMMICS
- **Recruiter** :
  Faron Catherine / Catherine.Faron@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

Strong knowledge of Semantic Web models and technics and experience in using state of the art machine learning algorithm for classification problems.

> **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

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.