**2022-05143 - Searching and querying distributed data in a SoLiD ecosystem**

**Contract type:** Fixed-term contract  
**Level of qualifications required:** Graduate degree or equivalent  
**Fonction:** Temporary scientific engineer

**About the research centre or Inria department**

The Inria Sophia Antipolis - Méditerranée center counts 34 research teams as well as 7 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**

This offer is part of a collaboration between the WIMMICS research team and the company Startin’blox.

WIMMICS is a joint research team between Inria, the Université Côte d’Azur and the CNRS (I3S). Its researchers are interested in the representation and processing of knowledge graphs, particularly on the Web. [https://team.inria.fr/wimmics/](https://team.inria.fr/wimmics/)

Startin’blox is developing an innovative and ethical technology based on open standards to create federated applications based on linked data and web components. [https://startinblox.com/](https://startinblox.com/)

The objective of this collaboration is the design and evaluation of methods for search, indexing and discovery of services and datasets within the SoLiD ecosystem.

The SoLiD project, for “SOcial Linked Data”, launched in 2015 by Tim Berners-Lee and incubated at the W3C, proposes the specification of a new web application architecture allowing a complete decoupling between data storage and business applications. Thus, the massive deployment of applications respecting SoLiD standards would make it possible to re-establish decentralisation on the web and give users the possibility of keeping control of their data, in “personal servers” called PODs.

At present, the project consists of a set of ten or so more or less advanced specifications and there is a very active community working on several implementations. However, some fields are not yet covered, such as the querying of these distributed data.

**Assignment**

The aim is to design and evaluate methods for searching and querying distributed data in a SoLiD ecosystem.

The ability to perform advanced searches on large volumes of data with acceptable performance is one of the foundations of information flow and the construction of social applications.

The candidate will therefore investigate possible solutions to build on top of the SoLiD architecture capabilities for service discovery and pathfinding and access to distributed datasets, by standardising the searching and filtering capabilities of PODs. To do this, we could use SPARQL traversal or decentralised query approaches to design a pilot architecture that also meets the performance challenges, for example via cache or index systems. This would allow us to support the diffusion of the SoLiD ecosystem on a web scale.

**Main activities**

- Study and evaluate the state of the art in terms of access and query of distributed linked data considering their compatibility with a SoLiD architecture.
- Evaluate the need for indexing and the possible options (global, partial, distributed, hybrid, etc.) and their suitability in a potentially large-scale SoLiD ecosystem.
- Study and evaluate approaches such as traversal queries or query routing, combination of partial query methods (e.g. Linked Data Fragments) or caching, and discovery of query possibilities at a given server or POD in order to propose a decentralised query method at the scale of a SoLiD ecosystem

**Skills**

- RDF, SPARQL, Linked Data, Web Architecture, SoLiD, Python, JavaScript

**Benefits package**

- Subsidized meals
- Partial reimbursement of public transport costs

**General Information**

- **Theme/Domain:** Data and Knowledge Representation and Processing  
- **Town/city:** Lyon  
- **Inria Center:** CRI Sophia Antipolis - Méditerranée  
- **Starting date:** 2022-09-01  
- **Duration of contract:** 2 years  
- **Deadline to apply:** 2022-08-23

**Contacts**

- **Inria Team:** WIMMICS  
- **Recruiter:** Gandon Fabien  
  
  [fabien.gandon@inria.fr](mailto:fabien.gandon@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**

There you can provide a “broad outline” of the collaborator you are looking for what you consider to be necessary and sufficient, and which may combine:

- tastes and appetencies,  
- area of excellence,  
- personality or character traits,  
- cross-disciplinary knowledge and expertise...

This section enables the more formal list of skills to be completed and ‘lightened’ (reduced):

- “Essential qualities in order to fulfil this assignment are feeling at ease in an environment of scientific dynamics and wanting to learn and listen.”
- “Passionate about innovation, with expertise in Ruby on Rails development and strong influencing skills. A thesis in the field of **** is a real asset.”

**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.
- 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)

**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.