Offer #2024-08414

Design and development of a data visualization library for SPARQL query results

Contract type : Internship agreement

Level of qualifications required : Master's or equivalent

Fonction : Internship Research

About the research centre or Inria department

The Inria center at Université Côte d'Azur includes 42 research teams and 9 support services. The center's staff (about 500 people) is made up of scientists of different nationalities, engineers, technicians and administrative staff. The teams are mainly located on the university campuses of Sophia Antipolis and Nice as well as Montpellier, in close collaboration with research and higher education laboratories and establishments (Université Côte d'Azur, CNRS, INRAE, INSERM …), but also with the regional economic players.

With a presence in the fields of computational neuroscience and biology, data science and modeling, software engineering and certification, as well as collaborative robotics, the Inria Centre at Université Côte d'Azur is a major player in terms of scientific excellence through its results and collaborations at both European and international levels.

Context

In today's data-driven world, vast and complex datasets are increasingly published using RDF (Resource Description Framework) and made available as Linked Open Data (LOD). These datasets hold immense potential for decision-making across various fields, but their value lies in the ability to effectively analyze and visualize the information they contain. Custom visualizations, while powerful, are often hard-coded, requiring specialized programming skills and making them challenging to reuse across different applications. Additionally, these solutions lack transparency, making it difficult to understand how visualization and interactivity are configured. Simplifying the creation of visualizations for non-programmers, while taking into account both data structures and user intent, is therefore essential. Despite advancements, most existing visualization approaches are tailored for datasets in formats like CSV or JSON, overlooking the unique complexities of RDF datasets.

The objective of this internship is to simplify and enhance the creation of visualizations for RDF datasets, making them accessible to both semantic web experts and decision-makers without extensive programming skills. The intern will contribute to the development of a visualization library inspired by tools like ECharts. This library will transform SPARQL queries and visual mapping configurations into interactive, reusable visualizations that can be directly applied to various projects.

Assignment

Responsibilities:
Using web technologies, the recruited individual will be tasked with designing and developing a visualization library tailored to SPARQL query results.

Resources for Further Exploration:
A literature review, bibliography, and scientific references are available at the following links:

- https://hal.science/hal-03518845
- https://hal.science/hal-03404572

Feel free to consult these resources to gain a deeper understanding of the research context.

Collaboration:
The recruited individual will work under the guidance of:

- **Aline Menin**, an expert in data visualization,
- **Marco Winckler**, an expert in interactive systems engineering,
- **Catherine Faron**, an expert in semantic web technologies.

Main activities

Main activities (maximum 5):

- **Literature review**: Explore existing methods for generating visualizations from SPARQL queries.
- **Standards analysis and proposal**: Identify visualization standards and design a configuration approach aligned with these standards.
- **Library development**: Implement a JavaScript library that converts SPARQL queries into interactive visualizations, utilizing modern web technologies.

Complementary activities (maximum 3):

- **User evaluation**: Assess the relevance and usability of the library through user testing.

Skills

Technical skills and level required : Web development (Javascript, HTML, CSS)

Languages : English or French

Relational skills :

Other valued appreciated : data visualization, semantic web

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
- Contribution to mutual insurance (subject to conditions)

Remuneration

Traineeship grant depending on attendance hours.

General Information

- **Theme/Domain** : Interaction and visualization
  Web development (BAP E)
- **Town/city** : Sophia Antipolis
- **Inria Center** : Centre Inria d'Université Côte d'Azur
- **Starting date** : 2025-03-01
- **Duration of contract** : 5 months
- **Deadline to apply** : 2025-02-28

Contacts

- **Inria Team** : WIMMICS
- **Recruiter** :
  Menin Aline / aline.menin@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

Applications must be submitted online on the Inria website. Collecting applications by other channels is not guaranteed.

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.