Offer #2025-09140

Post-Doctoral Research Visit F/M Tradeoff exploration and management for the Edge-Cloud Continuum

Contract type : Fixed-term contract

Renewable contract : Yes

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

About the research centre or Inria department

The Inria Centre at Rennes University is one of Inria's nine centres and has more than thirty research teams. The Inria Centre is a major and recognized player in the field of digital sciences. It is at the heart of a rich R&D and innovation ecosystem: highly innovative PMEs, large industrial groups, competitiveness clusters, research and higher education players, laboratories of excellence, technological research institute, etc.

Context

The successful candidate will join a dynamic and international research team (https://stack.inria.fr). As a funded Postdoctoral researcher, you will investigate novel programming models and resource management techniques for the Edge-Cloud Continuum with a particular interest on tradeoff management between cost and quality.

The research of this PostDoc position will be conducted as part of the QUICK project (_Collaborative services for Urgent systems across the Edge-Cloud Computing Continuum_), funded by the "Etoiles Montantes" regional award. Our Postdocs are given the opportunity to work on the SLICES-FR large-scale experimental platform and gain interdisciplinary expertise by participating in national and international (EU funded Horizon Europe) projects.

Assignment

Computing is shifting from the traditionally centralized cloud to a distributed set of heterogenous resources located between the edge, the cloud and in-between. As computing as moved to this *Computing Continuum*, the tradeoff between performance, availability and cost has become increasingly complicated.

The Computing Continuum aggregates the architectural and algorithmic challenges of its subcomponents while presenting new challenges related to their control and adaptation. Urgent analytics describes time-critical, data-driven scientific workflows that can leverage distributed data sources in a timely way to facilitate important decision making in case of natural disasters, extreme events and so on. In such context, urgent analytics are in critical need for the untapped potential of the Computing Continuum. The rapidly increasing variety, scales, resolutions, and availability of observational data, such as that provided by sensor networks and scientific observatories, provides the potential for new insights for addressing scientific and societal challenges

Main activities

This research work is structured around two research axis to enable a new class of applications capable of eacting to edge dynamics and using these insights to drive computation and actuation. First, establishing models of infrastructure availability and efficiency will allow decision-making to consider the flexibilities of applied models. Second, delivering software abstractions that incorporate application context and infrastructure events to program urgent analytics on top of continuum infrastructure.

Main activities (5 maximum) :

- Identify common patterns in data-driven analytics
- Survey adaptions mechanisms and policies for Edge-Cloud infrastructure
- Establish quality/costs tradeoffs for computations at runtime
- Propose interfaces and integration of findings in a collaborative platform
- Validate results on real platforms and publish findings

Additional activities :

- Proposition/supervision of students projects for Master-level students
- Involvement in conference committees and local events
- Possibility of teaching at IMT Atlantique or Nantes University

Application documents:

- Motivation letter (including, but not limited to, basic information such as who you are, your educational background, and motivation for this position. Why does your expertise and vision fit the profile of this open position?)
- Full CV including at least 2 references
- 1-2 relevant scientific articles contributed by the candidate

Application Process and Interview:

- Interviews will typically take place via zoom.
- Applicants are encouraged to apply promptly as the position will be filled upon finding the right candidate.

Skills

Technical skills:

- PhD in Computer Science or Electrical Engineering
- Fundamentals of Distributed systems and Utility Computing (Cloud, Edge, IoT)
- Experience in scheduling and optimization algorithms
- Practical experience with containers and middlewares
- Track record of publications in Cloud or Systems communities

Languages :

- English is mandatory, French is a plus

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.)

Remuneration

Monthly gross salary amounting to 2788 euros

General Information

- **Theme/Domain :** Distributed Systems and middleware
  System & Networks (BAP E)
- **Town/city :** Nantes
- **Inria Center :** Centre Inria de l'Université de Rennes
- **Starting date :** 2025-10-01
- **Duration of contract :** 1 year, 1 month
- **Deadline to apply :** 2025-09-10

Contacts

- **Inria Team :** STACK
- **Recruiter :**
  Balouek Daniel / Daniel.Balouek@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

- You are enthusiastic about developing and investigating innovative research ideas and systems within the discipline of distributed systems
- You have a strong background in distributed systems, Edge or Cloud computing and machine learning techniques
- You stand out from your peers because of strong commitment and independent work
- You are a team player and communicative (excellent oral and written English skills, good ability to write scientific publications)

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

Please submit online : your resume, cover letter and letters of recommendation eventually

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.