2018-00926 - Design and development of a measurement platform for the quality of mobile Internet access

Contract type : Public service fixed-term contract
Level of qualifications required: Graduate degree or equivalent
Fonction : Temporary scientific engineer

Context
The recruited engineer will be part of the Inria Project Lab (IPL) initiative, entitled BetterNet “An Observatory to Measure and Improve Internet Service Access from User Experience”. The goal of the work of the recruited engineer will be to focus on the design and the development of a measurement platform for the quality of mobile Internet access by federating the existing mobile platforms identified in the BetterNet IPL. The requested engineering efforts are therefore intended to support the convergence of existing tools and mobile platforms that are developed by the MiMove, Spirals, and Diana teams. Beyond the priceless value of such a measurement platform for the research community, the aim is also to publish live reports on the quality of mobile Internet access through the BetterNet initiative.

The BetterNet Inria Project Lab (IPL) propose new original user centered measurement methods, which associate social sciences to better understand Internet usage and the quality of services and networks. The observatory can be defined as a vantage point, where (1) tools, models and algorithms/heuristics will be provided to collect data, (2) acquired data will be analyzed, and shared appropriately with scientists, stakeholders and civil society, and (3) new value-added services will be proposed to end-users. This IPL initiative has already started developing and deploying measurement tools in the domain of Quality of Access to Internet:

- HostView (https://github.com/inria-muse/hostview-win) is a tool developed at Inria (Paris). HostView runs at a user's end-device to collect network performance metrics annotated with explicit user feedback on networked applications' performance. The first version of HostView ran on Linux and MAC OS, and we have a new version for Windows. We have started the development of an Android version, which will have to be finalized and maintained.
- APISENSE® (http://apisense.io) is a distributed platform composed of two Cloud-based services—Hive and Honeycomb—developed at Inria (Lille – Nord Europe) by Spirals that aims to deliver a crowd-sensing-as-a-service solution to collect metrics in the wild in order to analyze and visualize them in real-time.
- ACQUA (http://project.inria.fr/acqua) is an Application for predicting Quality of User Experience at Internet Access. Starting from network-level measurements (bandwidth, delay, loss rates, etc.), ACQUA targets the estimated Quality of Experience (QoE) related to the different applications of interest to the user without the need to run them (e.g., estimated Skype quality, estimated video streaming quality). ACQUA consists of a mobile application, but also of a backend for assisting the mobiles in their measurement task and in collecting their feedback and results.

Assignment
The goal of the work of the recruited engineer will be to build the mobile platform for the BetterNet scientific collaboration by initiating the technical convergence of existing tools (HostView, APISENSE®, and ACQUA) into a mobile measurement platform. The key objectives are to:

- Design and develop an open measurement platform for the quality of mobile Internet access connected to existing tools (i.e., setup and manage the backend infrastructure for data collection and analysis),
- Design and integrate an API to orchestrate cross-tool measurements,
- Finalize the new version of HostView for Android based on APISENSE®
- Design and develop new network visualizations to be delivered to end-users,
- Support and maintain the open measurement platform hosted by the HSL Platform located at Inria Nancy
- Assist in the deployment of small- and then large-scale experiments.
- Strengthen the integration between ACQUA and APISENSE® by triggering network measurement from the HostView/APISENSE mobile app.

Main activities
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- Redesign of the APISENSE backend to more easily allow for online processing of individual data sets and correlation across datasets.
- Development of the data anonymization and aggregation system to publish data as open data
- Finalization of the development of Hostview for Android and integration of ACQUA as an APISENSE mobile app.
- Design and implement visual online representations of the collected datasets as incentives for user participation.
- Provide assistance to the research community interested in deploying new measurement campaigns and/or exploit the collected data in order to publish new visualisations.

Additional activities:

- Participate on project meetings and present the advancement of the work.

General Information

- Theme/Domain : Networks and Telecommunications
- Town/city : Villers-lès-Nancy
- Inria Center : CRI Nancy - Grand Est
- Starting date : 2018-10-01
- Duration of contract : 2 years
- Deadline to apply : 2018-09-03

Contacts

- Inria Team : RESIST
- Recruiter : Chrismient Isabelle / isabelle.chrismient@inria.fr

About Inria

Inria, the French National Institute for computer science and applied mathematics, promotes "scientific excellence for technology transfer and society": Graduates from the world's top universities, Inria's 2,700 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

Conditions for application

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). Authorization 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.

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.
- Write documentation on all developed software and the platform infrastructure.

**Skills**

- Required skills: experience in software development (including Git, test frameworks, continuous integration, Docker containers), basics of modern web technologies (HTML, javascript, CSS, JQuery, D3.js), Linux server administration (web servers, databases and scripting).
- Additional skills: mobile application development (e.g., Android), experience with large-scale data management and data mining tools.
- Comfortable communicating in English.

**Benefits package**

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

**Remuneration**

Monthly gross salary from 2562,00€