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[Inria, France](#)

## Software Engineer, Geometry Processing for 3D Urban Modeling and Metrology (M/F)

### About Inria and the job

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.

**Team Presentation.** Our overall objective is the computerized geometric modeling of complex scenes from physical measurements. On the geometric modeling and processing pipeline, this objective corresponds to steps required for conversion from physical to effective digital representations: analysis, reconstruction and approximation. The related scientific challenges include:

1. being resilient to defect-laden data due to the uncertainty in the measurement processes and imperfect algorithms along the pipeline,
2. being resilient to heterogeneous data, both in type and in scale,
3. dealing with massive data,
4. and recovering or preserving the structure of complex scenes.

See our web site: <https://team.inria.fr/titane/>

### Mission

**Context.** In the past few years our research team made several advances and related software prototypes on 3D reconstruction and approximation, as well as on 3D urban modeling. Preliminary feedback from industrial partners has highlighted the commercial potential of our software prototype. However, we need to implement several crucial steps in order to address some obstacles to its practical application and transform it into a robust proof of concept, i.e. a demonstrator. First, in order to demonstrate tangible advantages in real-world industrial cases, we will perform case studies that will be used to drive software design choices and identify possible limitations. These case studies will be performed in collaboration with industrial contacts in the areas of metrology and geographic information systems (GIS). Second, we need to improve our prototype’s scalability and speed. Third, we need to facilitate its adoption by conforming to programming standards and converting it into modular components for the Computational Geometry Algorithms (CGAL) Library, which are interoperable within industrial software workflows and easy to maintain and extend.

The engineer will be in charge of:

- Converting the current prototypes into a software demonstrator based on the CGAL library for geometry processing and 3D urban modeling;
- Carrying on extensive experiments on geometric datasets;
- Implementing plugins for an interactive demo based on Qt5 and OpenGL.

In addition, she/he will report the new developments and findings to our industrial partners on a regular basis, and implement the changes required for smooth integration into their technological framework.

## Job offer description

Activities of the engineer:

- Implementation of a software demonstrator for CGAL: generic C++, with unit tests, examples, documentation and benchmarks.
- Implementation of an interactive demo: C++, Qt 5 and visualization via OpenGL.
- Drafting of technical reports: detailed description of technical solutions and experiments on use cases provided by our industrial partners.

## Skills and profile

Qualifications & experiences:

- Engineer or Master's degree in Computer Science.
- Experience in generic C++ programming, 3D geometric data structures and algorithms, algorithms on polygon meshes, rendering using OpenGL.

Skills & qualities:

- Ability to read, understand and implement research papers.
- Ability to report on experiments performed on case studies.
- Knowledge of CMake, cross-platform software development and the Qt library.
- Fluency in English (spoken and written).

## Benefits

- Restaurant on site
- Financial participation for public transport
- Social and sporting activities
- French courses

## Additional information

- Duration: 12 months
- Targeted hiring date: beginning of February 2017
- Location: Sophia Antipolis
- Gross Salary per month: from 2546 €, depending on qualifications and experiences.
- Applications must be sent before end of December, 2016

## Security and defense procedure

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.

## Warning

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

***Inria's disabilities policy: All positions at the institute are open to disabled people.***

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## Application details

**Published:** November 8, 2016  
**Application deadline:** December 31, 2016

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## Postdoctoral position - Security of embedded devices highly constrained (CDD 24 months - Rennes)

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Project: TAMIS Scientific...



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