2018-00979 - Research Engineer: Graphics for Learning and Validation

Renewable contract: Oui
Level of qualifications required: Graduate degree or equivalent
Fonction: Temporary scientific engineer
Level of experience: Recently graduated

About the research centre or Inria department

Inria is a national research institute dedicated to digital sciences that promotes scientific excellence and transfer. Inria employs 2,400 collaborators organised in research project teams, usually in collaboration with its academic partners. This agility allows its scientists, from the best universities in the world, to meet the challenges of computer science and mathematics, either through multidisciplinarity or with industrial partners. A precursor to the creation of Deep Tech companies, Inria has also supported the creation of more than 150 start-ups from its research teams. Inria effectively faces the challenges of the digital transformation of science, society and the economy.

Context

The goal of this position is to build a state-of-the-art image synthesis platform for training and testing computer vision and computer graphics algorithms. We have already set up an initial pipeline based on 3DSMax (http://www.autodesk.com/products/3ds-max/overview) and Blender, and the Mitsuba renderer (https://www.mitsuba-renderer.org/). This pipeline includes our own custom plugins to parse the 3D scenes and render high quality images, as well as to run various computer vision algorithms on the rendered images (structure from motion, multi-view stereo). We use this synthetic data to evaluate the accuracy of our recent algorithms on image relighting and image-based rendering. We also want to generate large collections of rendered images for training machine learning algorithms such as Convolutional Neural Networks (CNNs).

In this context, the goal of this software engineering position will be to significantly extend our software infrastructure to generate large amounts of high-quality realistic images. The engineer will be in charge of designing and implementing novel features of the pipeline to make it more flexible and easy-to-use. These include (among others) automating the conversion of 3D scenes in various formats; automating the generation of new scenes by modifying the geometry, materials and lighting of existing scenes; simplifying the use of the Inria cluster for large-scale computation.

These new features will involve writing scripts and plugins for 3DS Max and Mitsuba, as well as implementing published methods on automatic scene generation and augmentation. The position involves working closely with Ph.D. students and postdoctoral fellows in the group.

This position is part of the FUNGRAPH ERC project (http://fungraph.inria.fr and http://fungraph.inria.fr/fungraph-jobs.html)

Assignment

The main activities will include programming and system design (see above)

Benefits package

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

General Information

- Theme/Domain: Interaction and visualization
- Instrumentation et expérimentation (BAP C)
- Town/city: Sophia Antipolis
- Inria Center: CRI Sophia Antipolis - Méditerranée
- Starting date: 2018-10-01
- Duration of contract: 1 year, 6 months
- Deadline to apply: 2018-11-30

Contacts

- Inria Team: GRAPHDECO
- Recruiter: Drettakis George / george.drettakis@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.

**The keys to success**

The ideal candidate will have a Masters in Computer Graphics, with extensive experience in building complex graphics systems in C++ as well as extensive knowledge of the theory and practice of the graphics pipeline (including GPU rendering and ray-tracing/global illumination). The ability to read, comprehend and implement research papers is also necessary. Knowledge of python and OpenCV will be very helpful, knowledge of cmake and some experience in deep learning and CNNs will also be appreciated. Fluency in spoken and written English is a requirement.

**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). 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.

**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.