Evaluation in Approximate Global Illumination Algorithms

Contract type: Public service fixed-term contract
Level of qualifications required: PhD or equivalent
Fonction: Temporary Research Position
Level of experience: Recently graduated

About the research centre or Inria department

The Inria Sophia Antipolis – Méditerranée center counts 37 research teams and 9 support departments. The center's staff (about 600 people including 400 Inria employees) is composed of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrators. 1/3 of the staff are civil servants, the others are contractual. The majority of the research teams at the center are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Six teams are based in Montpellier and a team is hosted by the computer science department of the University of Bologna in Italy. The Center is a member of the University and Institution Community (ComUE) "Université Côte d'Azur (UCA)."

Context

There are currently several very effective global illumination algorithms that manage to simulate the majority of significant visual phenomena (e.g., [Georgeiev12]); however, they are far from real time. On the other end of the spectrum, there are real-time global illumination solutions (e.g., [McGuire17]) that usually achieve very approximate solutions, but at interactive or real-time framerates, and often with remarkable visual quality. These solutions are typically built on light probes or virtual point lights, that can be seen as a sampling of path space.

We will first analyze error in the different steps of these approximate algorithms, possibly modelling the error with statistical tools that handle uncertainty [Smi13]. This will require careful analyses starting with simple configurations, moving up to more complex cases. We will investigate the effect of discretization, both spatial and directional, and quantify the effect on the accumulated error, using statistical methods or alternatively data-driven learning-based methods.

Bibliography


https://dl.acm.org/citation.cfm?id=3023978


Assignment

Research activities (bibliography, initial research exploration) for the topic above.

Main activities

See above.

Skills

Good knowledge of Computer Graphics, knowledge of Computer Vision desirable, good knowledge of C++ and OpenGL/GLSL and equivalent.

Benefits package

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

Remuneration

From 2900 euros gross monthly (according to experience)

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General Information

- Theme/Domain: Interaction and visualization
- Town/City: Sophia Antipolis
- Inria Center: CRI Sophia Antipolis - Méditerranée
- Starting date: 2018-10-01
- Duration of contract: 6 months
- Deadline to apply: 2018-08-04

Contacts

- Inria Team: GRAPHDECO (DRH)
- 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

Masters in Computer Graphics with some experience in research.

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.