

Position available

Engineer

Research or Domain Activities

- Perception, Cognition, Interaction

Team Research name : GraphDeco

Environment 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 engineer will work within a team located at the Inria Sophia Antipolis-Méditerranée research center in the south of France, conveniently accessible via public transportation.

<http://www.inria.fr/>

Team Presentation

Despite significant progress in Computer Graphics, HCI and Computer Vision, creating, manipulating and displaying high-quality visual content remains reserved to a small, well-trained professional elite. We believe that this difficult access is largely due to the core theoretical foundations of Computer Graphics, which were developed for accurate and complete synthetic content. The goal of GraphDeco is to redefine these foundations so they can simultaneously account for both traditional content as well as approximate and incomplete representations captured or produced by casual users.

Context

The Inria research group GRAPHDECO (<http://team.inria.fr/graphdeco>) is a partner of the EU H2020 project "EMOTIVE" (http://cordis.europa.eu/project/rcn/205688_en.html). The EMOTIVE project will be developing virtual cultural experiences through personalized storytelling and innovative technological solutions. In the context of this EU project GRAPHDECO will integrate its past Image-based rendering (IBR) solutions (see references below) into the tools developed in EMOTIVE, and will also integrate novel research solutions developed during the project. The engineer will work closely with a Ph.D. student working on the project as well as the principal investigator.

Image-Based rendering is an alternative approach to traditional 3D graphics which uses photographs of a scene instead of a geometric model, materials and lighting simulation. Our approach uses automatic multi-view stereo reconstruction of the scene with computer vision techniques, and build on the very approximate geometry to develop high-quality free viewpoint rendering of the scene by carefully reprojecting input images onto the current viewpoint.



The benefits of the approach for personalized storytelling and cultural heritage are to make the use and creation of 3D assets much easier and much more accessible to the virtual museum community.

Assignment

The engineer will be in charge of writing robust and optimized versions of research prototypes, both within the group's research code-based and within the Unity3D implementation of the image-based rendering pipeline, as well as developing new solutions. The engineer will also provide several tools to the other partners of the European project within the Unity3D IBR platform.

Description of the work

The work will involve programming in C++ and C# (for the Unity3D component) and writing shaders in GLSL and the Unity shading language; maintaining the groups IBR codebase (currently based on git, cmake and C++ for windows and linux) and the Unity3D codebase (with target platforms in windows and android) and providing documentation both internally and for the partners of the project. The engineer will also have responsibility for communicating with the project coordinator and providing the required reports in coordination with the principal investigator.

References:

Ortiz-Cayon et al. 2016; Automatic 3D Car Model Alignment for Mixed Image-Based Rendering. <http://www-sop.inria.fr/revs/Basilic/2016/ODMAD16/>

Thonat et al. 2016; [http:// Multi-View Inpainting for Image-Based Scene Editing and Rendering](http://www-sop.inria.fr/revs/Basilic/2016/TSPD16/) <http://www-sop.inria.fr/revs/Basilic/2016/TSPD16/>

Ortiz-Cayon et al. 2015; A Bayesian Approach for Selective Image-Based Rendering using Superpixels; <http://www-sop.inria.fr/revs/Basilic/2015/ODD15/>

Chaurasia et al. 2013; Depth Synthesis and Local Warps for Plausible Image-based Navigation; <http://www-sop.inria.fr/revs/Basilic/2013/CDS13/>

Skills and profile

The ideal candidate will have:

- *A Masters or engineering degree in Computer Science with a specialization in Computer Graphics*
- *Extensive experience in building complex graphics systems in C++ and experience in C#*
- *Extensive experience in Unity3D, preferably scripting and plugin creation*
- *Extensive knowledge of the theory and practice of the graphics pipeline (including GPU rendering).*
- *Some knowledge of computer vision (camera calibration, multi-view stereo) is required.*
- *Knowledge of cmake, git and OpenCV, and the ability to read, comprehend and implement research papers is desirable.*



Fluency in spoken and written English is a requirement.

Benefits

- *Restaurant on site*
- *Partial contribution to the costs of public transportation*
- *Possibility to use sport equipment within the campus*
- *Possibility of paid French classes*

Additional Information

Salary: based on experience (between 2500 and 2900€)

Starting date: as soon as possible

Contract Duration: 18 months, renewable up to 32 months, available immediately

Please send your detailed Resume and Covering letter showing your interest and letters of recommendation by email to the principal investigator George Drettakis: george.drettakis@inria.fr

- *Applications will be admitted until the position is filled*

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