2018-00762 - 4D Video-Based Rendering

Contract type: Public service fixed-term contract
Level of qualifications required: PhD or equivalent
Fonction: Post-Doctoral Research Visit
Level of experience: From 3 to 5 years

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 from 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

This project is within the context of the Inria-funded IPL AVATAR (in collaboration with the Inria research groups HYBRID, MIMETIC), and the ERC Advanced Grant FUNGRAPH. Two Inria groups are involved GRAPHDECO at Inria Sophia-Antipolis and MORPHEO at Inria Grenoble.

The postdoctoral fellow will be based with GRAPHDECO at INRIA Sophia-Antipolis, but will perform regular long-term (several weeks) visits to MORPHEO at Inria Grenoble.

Assignment

Video-based capture of human motion has made impressive advances in recent years [Microsoft, 4dviews, 8i]. In most cases, the capture process generates textured meshes that are used for display in computer graphics or virtual reality applications. In this project, we are particularly interested in the case of human capture of a self-avatar, and the realistic display of this avatar as part of the coordinated Inria Action IPL AVATAR. The postdoctoral fellowship will involve two Inria groups, MORPHEO in Grenoble that is a leader in human motion capture [Tsimitakis 2014, Leroy 2017] and GRAPHDECO in Sophia-Antipolis that has extensive experience in image-based rendering [Chaurasia 2013, Hedman 2016]. The main focus of the research will be to investigate the continuum between texture-map based solutions and their corresponding (potentially temporal) compression and temporal image-based rendering solutions. This is an exciting and very novel research area which has not been investigated before, involving the development of novel 4D representations, possibly building on surface light fields but also more recent view-dependent free-viewpoint methods. The project will benefit from one of the most advanced motion capture platforms in Europe [Kinovis], designed and maintained by MORPHEO. In the context of this project, specific capture configurations will be developed for the case of self-avatar sequences, supported by engineering staff at Inria Grenoble, allowing the postdoctoral fellow to concentrate on the development of novel algorithmic solutions.

References:
4dviews, https://www.4dviews.com
8i, https://8i.com

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: 2 years
Deadline to apply: 2018-07-14

Contacts

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

The keys to success

The ideal candidate will hold a Ph.D. in computer graphics or computer vision, preferably with some experience in both domains. We expect the candidate to have several publications at top venues in the corresponding fields (SIGGRAPH, Eurographics, EGSR, ICCV, CVPR, ECCV etc), and have demonstrated strong skills in conducting high-calibre research.

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.
Collaboration:
The recruited person will be collaborating with Ph.D. students, other postdoctoral fellows, permanent researchers and engineers of the two groups (GRAPHDECO and MORPHEO).

Steering/Management:
The person recruited will potentially supervise Masters students and collaborate on Ph.D. student projects.

Main activities
The main activity will be performing excellent research leading to top-notch international publications, with emphasis on the research topics outlined above. There will be some work related to the use of the capture platform in Grenoble.

Skills
Extensive knowledge of the theory of computer graphics or computer vision is required, as well as aptitude for programming (typically C++/OpenGL, but other skills such as CUDA, python, Unity3D etc are a welcome bonus). The ideal candidate will be competent in both areas. Knowledge of machine learning and corresponding programming skills are also welcome.

Languages: Excellent knowledge of English, spoken and written are a must.

Relational skills: Excellent presentation skills are also required.

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

Remuneration
2653€ gross salary