HR EXCELLENCE IN RESEARCH

2020-02752 - Engineer Position: Avatars for Virtual Reality

Contract type : Fixed-term contract
Level of qualifications required : Graduate degree or equivalent
Other valued qualifications : PhD
Fonction : Temporary scientific engineer

About the research centre or Inria department

The Inria Rennes - Bretagne Atlantique Centre is one of Inria's eight centres and has more than thirty research teams. The Inria Center is a major and recognized player in the field of digital sciences. It is at the heart of a rich R&D and innovation ecosystem: highly innovative PMEs, large industrial groups, competitiveness clusters, research and higher education players, laboratories of excellence, technological research institute, etc.

Context

This engineer position is open in the context of the Inria Research challenge "Avatar" http://avatar.inria.fr), which runs from 2018 to 2022. The goal of the project is to design avatars (i.e., the user's representation in virtual environments) that are better embodied, more interactive and more social, through improving all the pipeline related to avatars, from acquisition and simulation, to designing novel interaction paradigms and multi-sensory feedback. The "Avatar" project involves 6 Inria teams (GraphDeco, Hybrid, Loki, MimeTIC, Morpheo, Potioc), as well as our external academic partner Prof. Mel Slater (Uni. Barcelona) and 2 industrial partners (InterDigital and Faurecia), with use cases targeting primarily demonstrators for the field of immersive cinema (developed in collaboration with our industrial partner InterDigial - VFX/VR team, formerly Technicolor).

Due to the massive dissemination of consumer-grade Head-Mounted Displays and the huge investments from major industrial players, avatars are becoming a major requirement in immersive virtual reality applications, such as immersive media and movies, video games, virtual communities and social networks, sports and industrial training simulations, or medical cybertherapies. In all these applications, ensuring that users embody in an avatar is crucial for making people live a truly immersive and effective experience. For these reasons, an ideal VR experience should involve acquiring automatically, easily and quickly a high quality representation (photo-realistic or stylised) of the user to display in the virtual environment, automatically simulating the movements of this avatar based on the user's movements, e.g., using intuitive and non-invasive input devices, while enabling users to "sense" the properties of the virtual environment (e.g., physical, social) through their avatar. However, current avatars do not elicit today such immersive and effective experiences. The different Inria teams involved in the "Avatar" challenge have therefore been working together to break through the current technological limitations in the acquisition, simulation and control of avatars, as well as towards providing novel interaction paradigms enabling users to "feel" the virtual world through their avatar.

Assignment

Several pieces of software have been developed by the different Inria teams involved in the challenge over the 2 first years of the project, e.g., to handle avatar calibration, retarget motions on characters with different shapes, customize avatars, or animate and interact with the avatar. The goal is therefore to create a common platform that would be used by the Inria teams working on the topic of avatars, integrating first the minimum tools required to easily set up experiments and demonstrators involving avatars, as well as the relevant other tools developed in the different teams. The candidate will therefore work closely with the PhD students working on the "Avatar" challenge, in order to develop this platform, as well as to ensure that it can be deployed and used by the students and research fellows involved on the project. In the second part of the assignment, a major task will also be to develop demonstrators for the project, in relation to the topic of avatars for immersive cinema.

The person recruited will be in contact with Ludovic Hoyet (MimeTIC team) and Ferran Argelaguet (Hybrid team) for the technical aspects of developing the avatar framework, as well as with Laurent Guillot (MimeTIC team) for the Engineering monitoring.

As the position involves several teams through France, short-term visits to the different teams will also be organised to closely work with all the project members.

Main activities

The engineer will first be tasked with the development of a platform for using and conducting research on avatars (Unity, C#), which involves

- Defining the specifications in collaboration with the different teams
  - while ensuring the ease of integration of new tools by the students and research fellow working on the project
  - while ensuring the possibility of integrating external tools (not Unity or C# based) in the future, such as deep learning based tools developed by some of the teams
- Integrating the different motion capture systems used to animate avatars
  - Developing standard calibrations for the motion capture systems (calibrating the avatar to the user)
  - Integrating motion capture approaches from low to high levels of quality (e.g., mocap, IK based, ...)
- Integrating various techniques to interact with and through the avatar

General Information

- **Theme/Domain :** Interaction and visualization
  Software Experimental platforms (BAP E)
- **Town/city :** Rennes
- **Inria Center :** CRI Rennes - Bretagne Atlantique
- **Starting date :** 2020-09-01
- **Duration of contract :** 2 years
- **Deadline to apply :** 2020-07-31

Contacts

- **Inria Team :** MIMETIC
- **Recruiter :**
  Hoyet Ludovic / ludovic.hoyet@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

The keys to success

We are looking for excellent candidates, preferably with a solid background in computer graphics and good coding skills, who can work independently and who are also keen to collaborate with other researchers on a large-scale project.

Instruction to apply

Please submit online : your resume, cover letter and letters of recommendation eventually

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.

In a second stage (year 2), the engineer will be responsible for developing demonstrators for the project, in relation to the topic of avatars for immersive cinema.

Skills

- Experience in Computer Graphics is essential (MsC or PhD), if possible in Character Animation or Virtual Reality
- Experience in Unity (C#) would be beneficial
- Ability of understanding the scientific and technical challenges related to the development and use of avatars in VR
- Good software development skills, including knowledge of software development processes (e.g., source code management, continuous integration and continuous delivery, tests, agile method)

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs

Remuneration

Rémunération mensuelle brute à partir de 2562 euros selon diplôme et expérience