# Offer #2025-08621

# Post-Doctorant F/H Few-view efficient Gaussian avatar reconstruction

*The offer description below is in French*

**Contract type :** Fixed-term contract

**Renewable contract :** Yes

**Level of qualifications required :** PhD or equivalent

**Fonction :** Post-Doctoral Research Visit

## About the research centre or Inria department

Le centre Inria de l'Université de Rennes est l'un des huit centres d'Inria et compte plus d'une trentaine d'équipes de recherche. Le centre Inria est un acteur majeur et reconnu dans le domaine des sciences numériques. Il est au cœur d'un riche écosystème de R&D et d'innovation : PME fortement innovantes, grands groupes industriels, pôles de compétitivité, acteurs de la recherche et de l'enseignement supérieur, laboratoires d'excellence, institut de recherche technologique

## Context

In close collaboration with the EMOVA.ME company (https://www.emova.me/), the VIRTUS Team from IRISA and INRIA Center at Rennes University, are seeking to improve the 3D reconstruction of avatars from a few monocular views. Traditionally, avatar reconstruction methods search to fit a template polygonal mesh (a 3D morphable model) from multiple views, and estimate lighting properties to extract material properties as 2D textures [6]. Yet these techniques present limitations (dealing with hair or beard appearance, lack of specularity, lack of precision around key features such as eyes or mouth). Recent hybrid techniques have been mixing Neural Radiance Fields estimations (NeRFs [4], Gaussian

Splats[3]) with mesh-based reconstruction to significantly improve the level of realism, by overlaying NeRFs, 2D or 3D splats on the surface of template meshes [1,2,7]. Yet, such Neural Radiance Field techniques require a large collection of views to perform qualitative estimations. In situations with limited views as input, the technique needs to rely on strong priors, either by encoding avatars appearance in a latent space representation [5,7], trained on thousands of real or synthetic models, or by providing additional guidance to ensure the convergence of the Neural Field reconstruction.

## Assignment

The objective of this post-doc position is to contribute to the field of Gaussian Avatar reconstruction from few views. The post-doc will work closely with a research engineer hired on the project whose role is to prepare the datasets, help testing and assessing the quality of the results, optimizing the performances and integrating the results in the framework designed by the EMOVA.ME company.

The tasks of the post-doc will consist in:

- working on key qualitative limitations in the current avatar reconstruction approach, and prototyping improvements;
- improving the use of 2D/3D Gaussian Splatting techniques in the avatar reconstruction process and evaluating its qualitative impact, specifically on details such as eyes / ears / hair /beard, through the design of novel perceptual metrics and user studies;
- Improving separation between materiel estimation (albedo, roughness, specularity) and illumination, to enable a re-rendering of the avatar in different CG lighting conditions;
- introducing priors and additional guidance techniques to reduce the number of input views required and regularize the mesh and radiance field estimations;

## Main activities

The post-doc will contribute to advancing the state of the art. He will work with the team to

- interact with the Emova company to understand requirements and constraints
- design and implement new research prototypes
- publish the results in selective venues
- evaluate the quality of the generated results

## Skills

- Deep Learning
- 3D reconstruction techniques
- Computer vision
- Gaussian Splatting / Gaussian Avatars

## Benefits package

- Restauration subventionnée
- Transports publics remboursés partiellement
- Congés: 7 semaines de congés annuels + 10 jours de RTT (base temps plein) + possibilité d'autorisations d'absence exceptionnelle (ex : enfants malades, déménagement)
- Possibilité de télétravail (après 6 mois d'ancienneté) et aménagement du temps de travail
- Équipements professionnels à disposition (visioconférence, prêts de matériels informatiques, etc.)
- Prestations sociales, culturelles et sportives (Association de gestion des œuvres sociales d'Inria)
- Accès à la formation professionnelle
- Sécurité sociale

## General Information

- **Theme/Domain :** Interaction and visualization
  Scientific computing (BAP E)
- **Town/city :** Rennes
- **Inria Center :** Centre Inria de l'Université de Rennes
- **Starting date :** 2025-04-02
- **Duration of contract :** 2 years
- **Deadline to apply :** 2025-04-04

## Contacts

- **Inria Team :** VIRTUS
- **Recruiter :**
  Christie Marc / Marc.Christie@irisa.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 searching for a highly motivated candidate, with a PhD in topics related to 3D reconstruction, pose estimation, computer vision or machine learning. Ideally the candidate should have a prior experience with Neural Radiance fields, or a very good understanding of the techniques and underlying representations. Experience in perceptual evaluation is a plus.

The post-doc is a two-year position. The recruited candidate will be integrated in the VIRTUS team https://team.inria.fr/virtus/ and will work with a research engineer and a PhD student working both on Gaussian Avatars. The VIRTUS team is located in Rennes in the IRISA / Inria center of University of Rennes facility, one of the largest research centers in France, and focusses on a range of research questions related to avatars, locomotion, and virtual crowds, together with perceptual and interaction techniques.

Salary conditions start from 3000€ gross per month (2500€ net), including a number of benefits (transportation reductions, social care, etc.) and depend on your past expertise.

The position can be extended two more years through a new research proposal. INRIA center is also opening a number of starting researcher positions to which the candidate can apply during or after the post-doc.

**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.

## Instruction to apply

**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.