

We are recruiting a

Research Engineer in Computer Graphics (M/F)

Accurate visualization of ancient historical artefacts

Contract	Job level	Location
<i>Fixed term contract (1 year)</i> <i>Working time : full-time</i>	<i>Research and Development Engineer (Catégorie A – IGR)</i>	Inria Grenoble Rhône-Alpes 655 avenue de l'Europe 38334 St-Ismier FRANCE

Univ. Grenoble Alpes, University of Innovation

One of the major research-intensive French universities, Univ. Grenoble Alpes enjoys an international reputation in many scientific fields, as confirmed by international rankings. It benefits from the implementation of major European instruments (ESRF, ILL, EMBL, IRAM, EMFL*). The vibrant ecosystem, grounded on a close interaction between research, education and companies, has earned Grenoble to be ranked as the 5th most innovative city in the world. Surrounded by mountains, the campus benefits from a natural environment and a high quality of life and work environment. With 7000 foreign students and the annual visit of more than 8000 researchers from all over the world, Univ. Grenoble Alps is an internationally engaged university.

A personalized Welcome Center for international students, PhDs and researchers facilitates your arrival and installation.

In 2016, Univ. Grenoble Alpes was labeled «Initiative of Excellence ». This label aims at the emergence of around ten French world class research universities. By joining Univ. Grenoble Alpes, you have the opportunity to conduct world-class research, and to contribute to the social and economic challenges of the 21st century ("sustainable planet and society", "health, well-being and technology", "understanding and supporting innovation: culture, technology, organizations" "Digital technology").

* ESRF (European Synchrotron Radiation Facility), ILL (Institut Laue-Langevin), IRAM (International Institute for Radio Astronomy), EMBL (European Molecular Biology Laboratory), EMFL (European Magnetic Field Laboratory).

Key figures:

- + 50,000 students including 7,000 international students
- 3,700 PhD students, 45% international
- 5,500 faculty members
- 180 different nationalities
- 1st city in France where it feels good to study and 5th city where it feels good to work
- ISSO: International Students & Scholars Office affiliated to EURAXESS

The Patrimalp cross-disciplinary project

IDEX Université Grenoble Alpes has set up seven transdisciplinary projects to address scientific and socio-economic challenges at the confluence of disciplines.

The Patrimalp cross-disciplinary project brings together researchers in art history, archeology, physics and computer science. The goal is to enhance the understanding and restitution of historical artefacts. Patrimalp is hiring a Research Engineer for 18 months, to work on the restitution of archeological and historical artefacts.

The goal is to develop a software for the interactive visualization of historical artefacts, reconstructing the aspect they had initially: taking as input the geometry of the artefact, for example a statue, acquired by telemetry or photogrammetry, and information about the chemical composition of the material, usually multi-layered coatings, create photorealistic images of the artefact as it was on its first day.

Work environment

The work will take place in the Maverick team of the Jean Kuntzmann Laboratory (LJK) and Inria Grenoble Rhône-Alpes. This team is composed of 6 researchers and 6 PhD students. The research focuses on rendering and creating virtual images.

Main tasks

The tasks to be carried out are:

- **Data integration:** we have multiple sources of information about the artefacts: laser scanner, photographs, photogrammetric data, historical knowledge. The first task is to merge together these different data, consistently. It will probably be necessary to complete missing data by extrapolating from known areas.
- **Material aspect:** the materials used are multi-layered: base coat of paint, second coat, metal layer, paint over the metal, varnish. Several layers contribute to the aspect of the object. It will be necessary to implement a material model taking into account these multiple layers in real-time rendering. Also, we have information about the current chemical composition and reflectance of the material. We will have to work out the original composition and aspect: if the metal is oxidised, replace it with the unoxidised version; if the varnish has opacified, change it for a more transparent version, etc.
- **Visualization and rendering:** given the geometry and the material, create an interactive photorealistic visualization of the artefact, with varying lighting conditions. The goal is to allow users to interact with the visualization, change the viewing conditions, environment, illumination to observe how the aspect of the artefact changes.

Eligibility criteria

PhD in Computer Graphics, with a specialisation in photorealistic rendering and material models.

Skills required

- Computer graphics,
- Photorealistic rendering,
- Real-time rendering,
- Material models,
- Programmation,
- English.

Compensation and benefits :

- Wage: gross monthly salary starting from 2764€ and depending on the candidate's experience,
- 45 days of annual paid leaves.

Recruitment process

✉ In order to apply, please send your resume and a cover letter to the following email address, by January 20th at the latest:

Nicolas HOLZSCHUCH
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