

## 1. Position identification

<b>Title of post : researcher in 3D modeling</b>	
<b>Type of contract : Postdoc</b>	
<b>Category (A,B or C) : A</b>	
<b>Contract/project period : 2 years</b>	<b>Expected date of employment : 1<sup>st</sup> of November, 2024</b>
<b>Proportion of work : 100%</b>	
<b>Workplace : Laboratoire des sciences de l'ingénieur, de l'informatique et de l'imagerie</b>	
<b>300 Boulevard Sébastien Brant - Cours Spéciales CS 10413 - 67412 Illkirch cedex</b>	
<b>Desired level of education : Ph. D</b>	
<b>Experience required : Ph. D</b>	
<b>Contact(s) for information on the position (identity, position, e-mail address, telephone) : Mme Dominique Bechmann, professeure des universités, bechmann@unistra.fr, 33 (0)3 68 85 45 64</b>	
<b>Date of publication : July 16th</b>	
<b>Closing date for the receipt of applications : August 31<sup>st</sup></b>	

## 2. Research project or operation

<b>ANR POSTRURE Université de Reims Champagne-Ardenne et Université de Strasbourg</b>
<b>CE38 : Interfaces : Sciences numériques – SHS</b>
<p>The main objective of this project is to determine the respective roles of dynamic postures and emotional facial expressions (EFEs) in mental states attribution, focusing on both basic and more socially complex mental states (e.g., pride, contempt, authority), much less probed in the literature. More specifically, we want to determine whether dynamic postures simply serve to reinforce EFEs, or supply specific additional information, and how these cues are processed by all genders.</p>

## 3. Activities

<p>➤ <b>Description of the research activities :</b></p> <p>The production of an animated human avatar, from his skeleton, requires that the motion of the skeleton be conveyed to a geometric object representing its avatar's skin. This process is named skinning. The difficulty in these techniques is that the correlation between the skeleton and the skin is not the same at each point and depends on the nature of each body part.</p>
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Usually, avatars are represented by their surface with a polygon mesh. Our originality is our vision of object representation (Untereiner, Cazier, & Bechmann, 2013; Kraemer, Cazier, & Bechmann, 2009), which separates the topological representation, or more generally the combinatorial aspects, from the embedding representation defining the geometry. In the POSTURE project we aim to avoid the remaining skinning drawbacks by constructing a volume mesh instead of a surface mesh to animate more accurately the characters from the skeleton movements.

The main work will be to reconstruct a volumetric avatar from a semantically animated skeleton (face, body, finger) annotated with the induced mental states, and to animate it from the movements of the skeleton.

The input is an animated avatar skeleton, displaying dynamic postures including **emotional facial expressions (EFEs)** and semantically labeled with mental state. This animated avatar skeleton could be a normalized Induced dynamic posture annotated (IDPa).

A second input is a set of designed or scanned static textured geometric models representing human avatars, as those available in different public domain bases.

The aim is to animate these geometric models in accordance with the animated skeleton so as to display the corresponding dynamic postures. This coupling requires describing in which way the skeleton influences the surface and to which extent different parts of the object's volume are deformable.

➤ **Related activities :**

The 3D integration of emotional facial expressions (EFEs) on these avatars may possibly be tackled. Only realistic animation is considered (not their realistic appearance).

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## 4. Skills

➤ **Qualifications/knowledge :**

Good knowledge of geometric and graphic computing.  
Excellent knowledge in 3D modeling, especially in topological models based on combinatorial maps.

➤ **Operational skills/expertise :**

Practice of the CGoCN library for the development of 3D modeling operations.

➤ **Personal qualities :**

Good interpersonal skills to interact within the project and within the IGG team.

## 5. Environment and context of work

➤ **Presentation of the laboratory/unity :**

The laboratory is composed of 17 teams divided into 4 departments according to the fundamental disciplines of the laboratory (computer science, imaging and robotics, electronics and photonics, mechanics).

ICube also has 7 leading technological platforms in medical imaging and robotics, Internet of Things, remote sensing, photovoltaic materials, bioinformatics, biomechanics and water treatment.

➤ **Hierarchical relationship :**

The postdoc will have to integrate the IGG team and participate to the team life in an assiduous and regular way. He will work with Dominique Bechmann, Arash Habibi and Pierre Kraemer in the framework of the ANR Posture.

➤ **Special conditions of practice (notice attached):**

**To apply, please send your CV, cover letter and diploma to :**  
**bechmann@unistra.fr**