The candidate should be comfortable with as much following items as possible:

**Compétences**
- Perception of the other person’s physical or emotional state
- Influence on the sense of work
- Physiological signals
- Influence on the user’s experience

**Contexte et atouts du poste**

**Context**
Avatars are virtual anthropomorphic characters whose goals are to represent humans in virtual worlds. Such avatars are frequently used in personal applications such as video games, or collaborative scenarios [Pan and Steed 2017, Piumsomboon et al. 2018]. They allow their users to be virtually present in a personal or shared 3D synthetic world. Due to the massive dissemination of consumer-grade Head-Mounted Displays, avatars have become a major requirement in immersive applications, leading to major improvements in their visual quality. On one hand, it is now possible to personalize the avatar representation to the user, which impacts immersion [Wu et al. 2018], as well as to display onto these avatars accurate motions of users through the use of lightweight motion capture systems, and even to display believable facial expressions. On the other hand, avatars still lack from some of the more subtle information regarding the users’ psycho-physiological state, and therefore do not generally accurately inform us about their current real state. For example, an avatar may appear as peaceful whereas its user is very stressed or anxious, or appear rested after a strenuous effort while its user might be breathless. Therefore, new techniques are today necessary to enable avatars to more accurately represent the physiological state of its user.

**Mission confiée**

**Objective**
The objective of this postdoc is to explore approaches that will better reflect the current state of users by adapting their avatar’s visual appearance to their own physiological signals. In this project, we will thus first concentrate on the real-time recording and processing of physiological signals. These signals may include, but are not limited to, breathing, heart rate, galvanic skin response, facial muscle activity (electromyography) or ocular information (eye movements, blinks, pupillometry). While adapting the behaviour of non-player characters to the users’ physiological signals can influence their performance, e.g., for sports training in VR [Argelaguet et al. 2015], it is still unclear which signals are relevant to display on one’s avatar, and how to display them.

**Principales activités**
After concentrating on the real-time recording and processing, the second part of this postdoc will explore how to coherently map these modalities to the visual appearance of the avatar. This can be done by mimicking realistic behaviours (e.g. breathing [Bernadette et al. 2019]), or by proposing visual metaphors that map physiological states to avatar caracters. In particular, we will evaluate this impact on two principal dimensions, namely their influence on the sense of embodiment in virtual worlds (i.e., the degree to which users consider the avatar to be their representation in the virtual world), and their influence on the collaboration between remote users (e.g., perception of the other person’s physical or emotional state). These evaluations will be achieved by conducting controlled user studies.

**Compétences**
The candidate should be comfortable with as much following items as possible:
- Graphics programming and tools such as Unity3D
- VR setups (e.g. HMD)
- Character animation
- Physiological sensors recording and processing
- Evaluation methods
- Controlled users studies
- Immersion, presence, embodiment

**Avantages**
- Subsidized meals
- Partial reimbursement of public transport costs
- Possibility of teleworking (after 6 months of employment) and flexible organization of
working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Rémunération
2653€ / month (before taxes)

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Consignes pour postuler

Thank you to send:
- CV
- Cover letter
- Support letters (mandatory)
- List of publication

Sécurité défense:
Ce poste est susceptible d’être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L’autorisation d’accès à une zone est délivrée par le chef d’établissement, après avis ministériel favorable, tel que défini dans l’arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l’annulation du recrutement.

Politique de recrutement:
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.

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