Internship in Computer Sciences or Cognitive Sciences (Master degree)

Project AudioRV-AP : Development of a tool for spatial cognition rehabilitation in immersive virtual reality involving the auditory modality

Laboratories : Laboratoire Vision Action Cognition (VAC), Institut de Psychologie, Université Paris Cité, Boulogne-Billancourt
The internship will be in collaboration with the Laboratoire Interdisciplinaire des Sciences du Numérique (LISN), Université Paris Saclay, Orsay

Supervision: Alma Guilbert (alma.guilbert@u-paris.fr), Tifanie Bouchara (tifanie.bouchara@universite-paris-saclay.fr)

When: 6 months between January and August 2024 (to be determined with the candidate)
Remuneration: ~580 € / month (internship gratification)

Context and goals: The AudioRV-AP project aims to design, in a long-term process, a therapeutic rehabilitation program, based on sound localization in virtual reality (VR), for patients suffering from spatial neglect syndrome. Preliminary work [1] has allowed us to develop a sound localization training program in VR, and to validate it can improve sound localization for healthy people. We now want to make this multisensory training accessible to patients suffering from spatial neglect. The **AudioRV-AP** project has received support under the program "Investissement d'Avenir" launched by the French Government and implemented by ANR.

Tasks: The main objective of the internship will therefore be to take the pre-existing program and set up an experiment to evaluate several versions of it, by varying sensory modalities and other parameters like sound spatialization. The intern will have to implement new 3D scenes or virtual environments through Unity. Experiments with healthy participants will then be carried out to test different versions. Finally, the data collected will be analyzed to determine the effectiveness of the different programs.

Student profile: Master 2/3rd year engineering school level, or equivalent, in computer science or cognitive sciences with a strong interest in human-computer interaction, virtual reality, 3D audio, and multisensory perception.
Required skills: fluency in English or French. Capacity to work in a multidisciplinary research team (students in neuropsychology will work on the project).
Preferred skills (these competences could be learned at the beginning of the internship if needed) : 3D/game engine programming (Unity 3D, C#) as the development will be done on Unity for an HTC Vive Pro headset. Experimental protocol design. Previous experience in research involving human subjects.

How to apply: Applications must include a CV and a cover letter to the following two e-mail addresses: alma.guilbert@u-paris.fr, tifanie.bouchara@universite-paris-saclay.fr

Reference: [1] Bouchara, T., Bara, T.G., Weiss, P.L & Guilbert, A. (2019). Influence of vision on short-term sound localization training with non-individualized HRTF. *In Proceedings of the 1st EAA Spatial Audio Signal Processing Symposium*. https://hal.archives-ouvertes.fr/hal-02275168/document