

MSc Internship project proposal 2024

“Meditation in Virtual Reality, world creation assisted by Artificial Intelligence.”

We are looking for a 6-month intern, for a project starting next year. Please find more information below:

Who we are:

Campus Biotech is a Swiss center of excellence in biotechnology and life sciences research focusing on three domains: Neuroscience & Neurotechnology, Digital Health and Global Health.

The Virtual Reality Facility (<https://hnp.fcbg.ch/>) at the Fondation Campus Biotech Geneva (FCBG) is part of the Human Neuroscience Platform, and provides researchers with state-of-the-art equipment and expertise in the field of immersive interaction and motion analysis in virtual reality for experimental research and clinical applications (e.g. cognitive and affective assessment, cognitive and behavioral therapy, neurological rehabilitation, gait and upper limb neuro-prostheses).

The internship will be co-directed by [Mael Lacour](#) and [Loup Vuarnesson](#).

Project description:

The goal of the project is to review the new AI tools that allow us to create 3D environments and objects and integrate the chosen tool into the current study about meditation technique at LNCO. The aim of the tool will be to enable participants to personalize their 3D VR environment in real time, in order to make it their own and better engage them in the meditation phase. Objectives will be adapted according to the progress of AI technologies at the time of the internship.

Context:

In the research project « The Home within » currently underway at the EPFL's Blanke Lab in Campus Biotech Geneva, we investigate how traditional meditation techniques, neurotechnologies and virtual reality can be linked and aid the neuroscientific study of bodily self-consciousness. In this context, we designed a visual environment, specific audio guidances, as well as a virtual reality platform that seeks to immerse participants into meditative states. This design aims to foster peak meditative experiences and to extract rich biometrical and qualitative data from them.

To encourage participants to follow the audio instructions and support their ability to meditate within an immersive display, several user experience (UX) developments are currently underway.

One of them explores the possibility for participants to personalize the audiovisual environment during the initial phases of the experiment in which they will be immersed. More specifically we want to study through

which modalities it will be possible for them to tune the scenery to their particular tastes and what such features will bring regarding the whole quality of the experience.

We envision the development of a plugin incorporated into Unity that could process in a few minutes a personalized 3D environment. This environment would be designed using a set of text prompts and carefully chosen parameters, allowing control over the type of scenery (natural, minimalistic, fantasy...), the environment size, the time of day, the weather, and the presence of a few props that could enrich the scene.

Project Planning:

- 1) The first phase would be dedicated to the review and testing of available technologies, questioning their maturity and usefulness for the final product.
- 2) The second phase would be dedicated to implementing the chosen technologies in the expected plugin and designing the entire end-user flow (usability and overall user experience).

This structure and the planned milestones should be approached flexibly, as they may need to be adapted during the initial weeks of work. The final plugin design will have to be refined based on the results of the technical review. In this regard, the schedule should be discussed directly with the VR facility team.

Profile required:

- Knowledge or strong interest in artificial intelligence
- Mastery of the Unity engine
- Mastery of the development language: C#
- Knowledge of versioning tools (Git)
- Excellent communication and teamwork skills
- Excellent autonomy

The "Plus":

- Knowledge of 3D software: Blender or 3ds Max
- Fluency in English (oral and written)

The internship is for MSc level students performing their 5/6 months final research project in 2023. The position is full-time at FCBG in Campus Biotech. Ideally, the internship would start between February and May. Small monetary compensation.

Please send your resume and cover letter to vr@fcbg.ch.

If you have any visuals to show or project we can browse, don't hesitate to add them as well! We look forward to receiving your application.

The VR Team at FCBG