



Thesis Project Form

Title (tentative): Full, half-body or no avatar? Understanding the role of users' representation in XR

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Description

Motivation and application domain

The literature highlights the role and the importance of embodiment and representation of agents inside XR, i.e., the self-representation of the user acting in virtual environments, the representation of others in collaborative environments, or of non-player characters.

General objectives and main activities

Several solutions exist for creating avatars in XR, representing and animating the entire body (head, arms, legs) or a specific part (e.g., head and hands). Moreover, solutions to create avatars range from cartoonish depictions of the users to photorealistic and accurate representations. However, though several studies address the problem, little is still known about the role and the importance of avatar appearance inside XR. Indeed, many researchers still rely on very simple representations and animations, while others use more sophisticated approaches.

The main goal of this thesis is to devise a framework to understand the role of an avatar's appearance in different XR situations, involving both physical and social interaction with the environment.

Reference:

Martin Heitz, Flavien Lecuyer, Nicolas Pacquerd, Arash Habibi, Julien Casarin, et al.. Impact of avatar's legs on collaborative performance and social presence. VRW 2025 - IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops, Mar 2025, Saint-Malo, France.

Training Objectives (technical/analytical tools, experimental methodologies)

The student will perform the following activities:

- Analysis of the state of the art, about the role of avatar appearance in VR
- Implementation of different techniques to represent avatars, considering different levels of visual realism and body representation
- Selection of two existing scenarios, one focused on physical interaction, the other focused on social interaction
- Design of the experiments, experiments, and data analysis

Place(s) where the thesis work will be carried out: DIBRIS - Valletta Puggia

Additional information

Maximum number of students: 1