Virtual Reality and Multi-Sensory Interaction - VRI - Master SIF (2021-2022)

Written Exam

Time: 2h
Available documents: Any

A renowned museum would like you to design a virtual reality experience in which visitors could explore virtual art pieces and historical buildings. A minimum of four visitors have to be able be immersed in the virtual environment simultaneously. However, the experience will be "single user". Other visitors should remain hidden. The museum will install this exhibition in an empty room of 20 square meters. The main requirements of the application are:

- The size of the physical room is smaller than the virtual environment. Navigation methods must be provided in order to ensure that users can fully explore the virtual environment.
- Users have to be able to access to additional audio/visual information on demand of the exhibits.
- One virtual exhibit has to be interactive. The main interaction method has to be pick and place interactions.
- One virtual object has to be augmented with haptic information.
- An employee of the museum, hereinafter referred as the supervisor, has to be able to guide the visitors during the virtual experience. The supervisor must have a mechanism to virtually teleport to a location of his/her choice. This will be used for example to trigger specific scenarized events for all visitors.

While describing your proposal, we suggest that you start with the description of the hardware used, and then describe the different interaction methods based on the action-perception process. Justify your choices (e.g. hardware, input and output modalities, interaction techniques) and describe the potential impact of your choices in the user's experience (e.g. immersion, presence, simulation sickness, embodiment).

Do not forget to draw schemas of the different components of the interfaces in order to increase clarity. You can assume that technical aspects rendering of the 3D scenes and the physical simulation are solved, and that you have unlimited access to any VR hardware (think big).

Finish the discussion for each solution by the viability of the system, and any potential unsolved issues that may remain.