

# Collaborative Project Coordination in Immersive Virtual Environments

Keywords / Topics: Virtual Reality, Multi-User

## Abstract:

Construction projects require the continuous coordination of many stakeholders in order to fulfil time and budget constraints. Currently, such coordination meetings require each stakeholder to be physically present in a meeting room, since the interaction and discussion cannot be replaced through phone calls or screensharing. Multi-user virtual reality (VR) environments substitute the physical presence in real meetings by avatars in a virtual meeting. However, few is known about the efficiency and effectiveness of a coordination meeting held in VR, compared to the real one. As part of this thesis, the student shall investigate on the matter.

## Background

The rise of commercially available, low-cost virtual reality hardware leads to new fields of applications beyond the gaming sector. One promising field is the location independent collaboration through VR in industrial planning processes, as it would reduce the amount of travelling for the involved stakeholders. Besides potential cost savings, the prevention of unnecessary travelling could also significantly reduce the CO2 footprint. This work will be supported through an industry partner, which offers digital planning and engineering services in the construction sector.



*A construction coordination meeting held in the Nvidia Holodeck*

## Content of Work

Currently, off the shelf multi-user VR solutions such as the Nvidia Holodeck are getting released for industry. However, there is little known about the efficiency and effectiveness of these environments and the subjective, individual implications of users (e.g. acceptance). Therefore, the student should develop a multi-user VR environment for construction coordination meetings (e.g. with the Nvidia Holodeck). Subsequently, the student will get the opportunity to evaluate the developed VR environment in a real-world case together with an industrial partner. The thesis will conclude with a final presentation and the submission of a written report.

## Work Packages:

- Literature review on multi-user VR for collaborative planning processes
- Develop a multi-user VR environment for construction coordination meetings (e.g. with Nvidia Holodeck)
- Evaluate the developed VR environment together with the industry partner in a real-world case
- Intermediate and final presentation
- Written report, preferably in English (German is also possible)

## Information & administration

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