

# Remote User Representation in Virtual Reality

Keywords: Virtual reality, tracking, animation

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## Introduction

Many applications of immersive virtual reality require the collaboration of two or more users. This collaboration can be between users who are colocated in one tracking space or connected remotely via the internet. In both cases, the other users must be visually represented in the virtual environment to facilitate natural collaboration.

Often this representation is realized as a floating head and floating hands or controllers. However, this solution lacks realism and it can be difficult to interpret the body language of the remote parties. Since only head and hands are tracked, the legs are usually not represented at all.



## Content of the Thesis

The goal of this thesis is to design and implement a system that converts 3-point tracking data (head and hands) into a full body animation of an avatar that can be transmitted to a remote party. The system should be hardware independent and should be extensible to a 5-point setup for a first-person avatar.

Since the remote user cannot see what his partners are doing in reality, the main criterion for the animation is plausibility and not accuracy. This plausibility will be evaluated in a user study where the newly developed avatar-system is compared to an avatar that is animated with data from a full-body motion suit.

## Work Packages

- Research state of the art in avatar animation and avatars for VR systems
- Design and implement avatar animation system for 3-point tracking
- Enable multi-user collaboration with avatar
- Evaluate the performance/plausibility of the animation system in a user study
- Written report and presentation

## Requirements

To be considered for this thesis, you should have

- Programming skills, preferably in C#
- Interest in working with hardware and virtual reality
- Strong communication and interpersonal skills

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## Information & Administration

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