

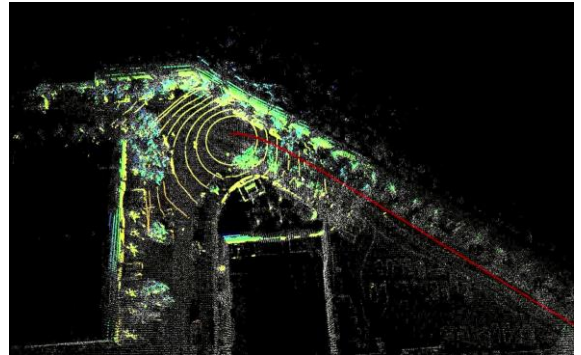
# Tracking Space Extension using SLAM

Keywords: Virtual Reality, SLAM

## Overview

In the last years, so-called redirected walking (RDW) has improved drastically. More and more different approaches were developed, however all of them still relies on a known environments. RDW algorithms are still bound to work in a limited tracking space. The algorithm has the dimensions of the environment and thus only operates within these dimensions. Ideally the user should be able to utilize all of the open space available thus increasing the space where the redirection can be applied.

In this thesis, you investigate the possibility of utilizing an external camera in order to map the physical environment consisting of several rooms.



## Tasks

Your task is to research on state of art SLAM implementations. Based on your research, you design and implement different SLAM algorithms and compare their accuracy with the other tracking data. You further create a map of the lab floor that can be later on used by the redirected walking algorithm.

You will present your work in an intermediate and a final presentation to the ICVR lab. Finally, you will summarise your results in a written report.

## Workpackages

- Literature research on SLAM
- Initialize and calibrate the camera
- Implement various state of art SLAM algorithms
- Compare the accuracy of the algorithm implemented with a regular tracking system
- Test the possibility of using the HMD localization to improve the point cloud
- Intermediate and final presentation
- Written report

## Skills

- Programming skills in C# and python
- Unity and/or VR experience is a plus
- Strong communication and interpersonal skills

## Results

The results of this thesis need to be summarised in a written report and will be presented to the ICVR in a 20min talk.

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