# Assessment

One of RE-liON's flagship products is a full-body immersive multi-user VR trainer called BLACKSUIT. One of the main features of BLACKSUIT is the multi-user system: up to sixteen people can be in the same virtual world at the same time, in a 30 by 30 meter area. Motion capture is done locally, on the participant, but does not produce an accurate overall position. An important consequence of being multi-user is that the participants' overall positions should be precisely correct in relation to each other: otherwise you would walk into your teammates.
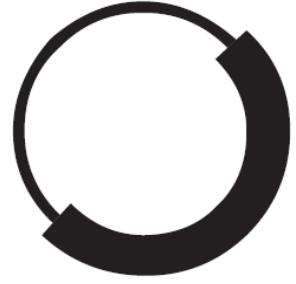
This assignment aims to solve that problem using optical sensors on each person and using SLAM (-related) technologies to figure out an absolute position. An interesting complication here is that there are many cameras in play, at least one on each participant. After creating a single-user system, how do we make sure the positions are consistent related to one another? Can sensors on each participant benefit from the SLAM image being built on the other?

Proposed items:

- Optical single-sensor positioning: figure out state of art, customer off the shelf (COTS) trackings solutions.
- Bench-map selected solutions for indoor vs outdoor usage
- Integrate into a working single-user VR simulator
- Bonus points: Combine into a networked system (multi-user)
- Bonus points: mapping environments not only for positioning, but also for reality capture
- Bonus points++: high-speed/low latency solution (enabling SLAM-based positioning for VR without extra sensors)
- Bonus points+++: sensor fusion with inertial sensors

Profile

Some knowledge of and experience with:

- C++
- Computer Vision

Contact

Depending on the requirements of personal profile the assignment can be scaled accordingly.

Are you interested in a internship or master thesis on this subject and fit the profile?
Please send an email to internship@re-lion.com