Abstract:

Research on the limits of human perception using the VisDome and the blue-c

| Туре: | Diploma- or Master thesis |
|----------------|---|
| published | Date of Publication November, 25th 2003 |
| internal coach | Andreas Kunz, <u>kunz@imes.mavt.ethz.ch</u> Martin Küchler, <u>kuechler@imes.mavt.ethz.ch</u> Josef Meile, <u>josef.meile@imes.mavt.ethz.ch</u> |

Keywords

Virtual reality, haptics, multi-modal interfaces, VisDome, blue-c



attractive picture which describes the thesis

Environment

In order to realistically represent objects virtual reality has to address not only the visual channel, but also additional ones like the acoustic or the haptic channel. Such systems are called "Multi-modal Systems". Beside the visual channel the haptic perception is very important, which is the perception of mechanical sensations. There is a lot of research in this field, mainly focusing of the haptic perception of the human hand. However, the sensation of walking is addressed inadequately by so-called treadmills.

Content of the Thesis

Within this thesis a preliminary research on the so-called "Freespace Walking" should be performed. This title describes the idea that the user is not walking in a treadmill anymore, but having the sensation of real walking instead. However, this constrains the amount of possible application due to the large required space. Thus first test should be performed on perceptual (optical) illusions that could reduce the required space for experiencing large objects by real walking. A typical illusion could be the permanent rotation of the virtual environment, which is done very slowly so that the user does not notice it. Existing installations like the VisDome or the blue-c should be used to perform these tests.

Tasks

- Become acquainted with Virtual Reality
- Literature research on the state-of-the-art of freespace walking
- Acquiring principles of multi-modal illusions
- Elaboration of possible solutions the reduce the unlimited virtual space to a limited real room ("Virtual shrinking")
- Selection of promising principles
- Intermediate presentation
- Working out a research plan for tests on the limits of human perception
- Performing the tests in the VisDome and the blue-c
- Written report and final presentation

