

# Master Project: Implementing Interaction Techniques for Scientific Data Visualizations in VR



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## Context

Input devices such as keyboard and mouse have been used for a very long time and many human-computer interaction techniques using these devices have been developed and matured over time. For example, there are well-known techniques for scrolling, zooming, panning and selecting with a mouse in 2D and 3D environments that are supported by different software tools in almost the same ways. In comparison, the input devices in Virtual Reality environments are new. Tracking the head and two hand-held controllers each with six degrees of freedom provides a huge input space. In order to exploit the potential power of such a large space, creative interaction techniques should be devised, tested and improved iteratively.

## Assignment

In this project, a user interface will be designed and implemented for scientific visualization tools. It should provide:

- mechanics for navigating within the data space by moving the viewpoint using techniques such as panning, flying, teleporting etc.



- a menu system by which the users can load/save files, change the settings and visualization parameters, etc.

- mechanisms for selecting parts of the data, moving, scaling, rotating, etc. using direct techniques such as virtual grabbing, pulling and stretching or indirect metaphors such as rotating table, etc.

This project will be implemented in GlobeEngine running on HTC Vive.

## Requirements

Interest in computer graphics and human-computer interaction. This project has to be done as a group project. If possible, all participants should have experience with OpenGL, optimally taken one of the graphics courses.

## Work Load

- 20% theory
- 50% implementation
- 30% testing

## Student Project Type

This topic can be done as a Master Project in a group of 2-3 persons. Goals are adjusted depending on the project type and the number of students.

## Supervision

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## Contact

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