# 2011 Internship Project Proposal: Control of a VR Setting using Direct-Touch Interaction

Direct-touch interfaces have recently become a popular way of interacting with computers. However, in scientific visualization only few approaches, thus far, have been explored (e.g., see example on the right). However, virtual reality environments have been a popular means of displaying and interacting directly-manipulatively with scientific
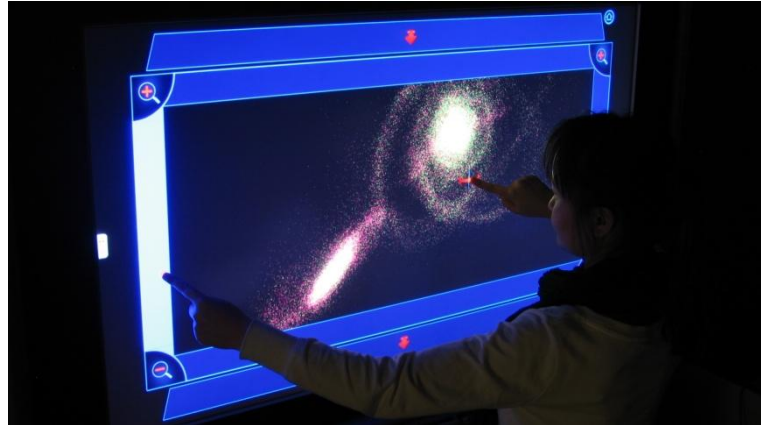
visualizations for many years. The reason for this popularity is that scientific visualization, in most cases, deals with 3D datasets and, therefore, is very suitable for 3D stereoscopic projection in a VR environment. The 2D interaction surface of touch screens, however, has interesting advantages that may be useful in VR environments which, in turn, provide large display surfaces and the potential for stereoscopic 3D projection. This project, therefore, will investigate the synthesis between a VR display environment and a direct-touch interaction setting.

For this purpose we will use a touch-interactive table/wall display, placed in front of the VENISE CAVE environment (EVE) at CNRS-LIMSI. The project will start by implementing an interface on the touch display that allows people to perform 3D navigation tasks as well as manipulation of 3D objects displayed in the EVE environment. The interaction on the touch surface needs to happen in a way that users and observers intuitively understand the mapping between the two displays. Depending on the chosen application domain (e.g., molecular visualization including the docking of proteins, fluid dynamics simulations, astronomical simulations, or others) the project will develop and implement effective interaction techniques to enable selection, re-arrangement, changing the view, and exploring additional data sources. Another potential extension is examining the collaboration of several people when interacting with the visualization, either both at the touch display or one at the touch display and the other in the 3D virtual environment.

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