

VR Interface for Scientific Visualization

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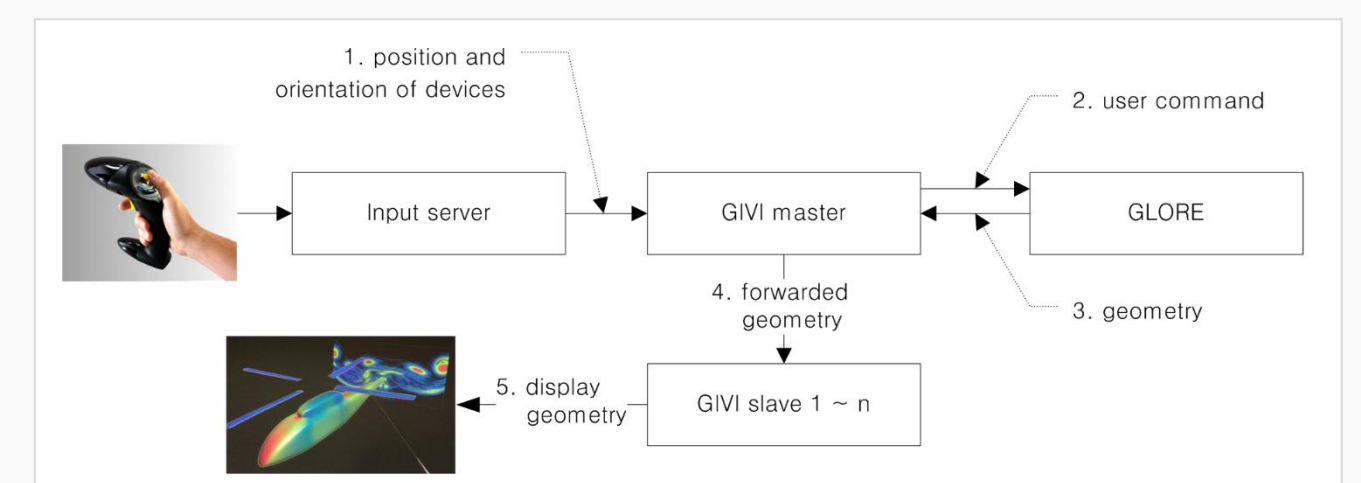
Abstract

I propose a VR interface for scientific visualization, and I present core functions and practical applications. The core functions consist of user-friendly UI, wrist motion based manipulation, and smart device interface. I present the details of the functions, and show that the practical results on VR systems. Moreover, I explain some developing issues of our VR interface and show that the usability test results for improving the system efficiency.

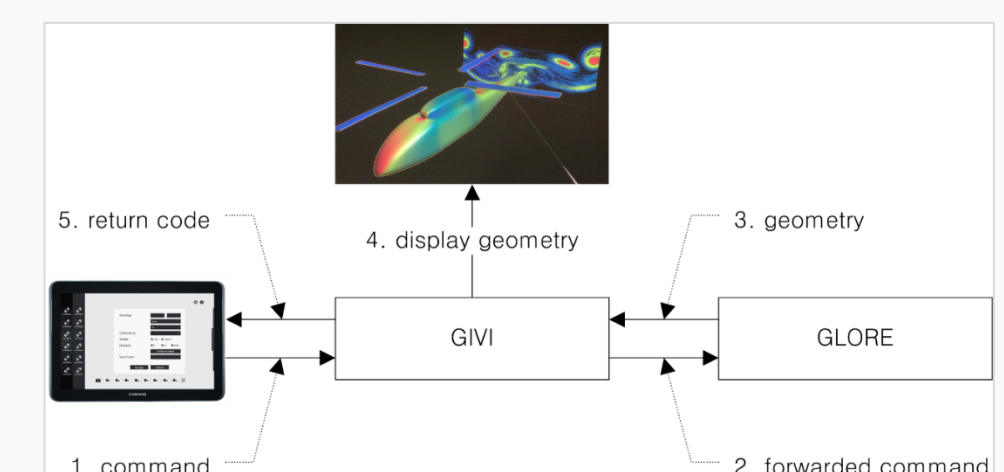
Overview of VR Interface

The WI (Wrist-motion based Interfaces) uses the wrist-motion information of the wand-using hand to operate VR systems. Existing VR interfaces use picking methods based on the location and direction of the wand, so the manipulations of VR environments are complicated, whereas WI is easy to manipulate even on a complicated interface such as WIMP(Window, Icon, Menu, Pointing device).

The SI (Smart device Interfaces) provides smart device interface for those who are not familiar with 6 DOF input devices, which makes it difficult to use the WI. Compared with 6 DOF input device, our SI is much more intuitive and efficient in performing visualizations tasks.



Workflow of VR input device interface



Workflow of smart device interface

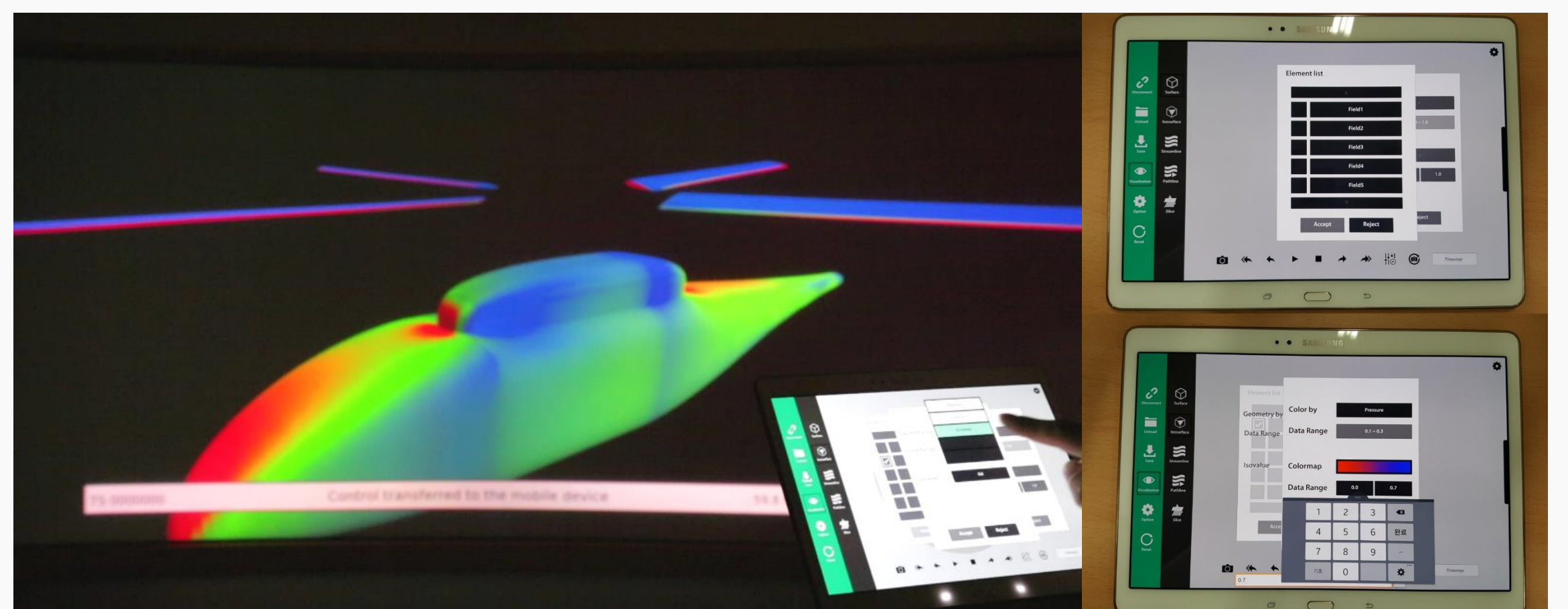
Implementation Results

Integrated to KISTI's visualization software stack.

- Runs on a 17-nodes display cluster with four 4K projectors



Implementation result of wrist-motion based interfaces



Implementation result of smart device interface

Usability testing of WI/SI reveals its superb effectiveness and efficiency: its system usability scale score is 41 % higher than that for other commercial tools

	EnSight VR	Our WI	Our SI
SUS score	50.7	65.4	71.5

Concluding Remarks

In this work, I have presented a VR interface for scientific visualization. It provides intuitive manipulation through wrist motion-based interfaces and smart device interfaces. However, these method is require special devices to manipulating the visualization tasks on VR environment. Therefore, efficient manipulating methods using the contactless sensing technology should be developed and improved for application to intuitive manipulating on VR environment.

Reference

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