



Tutorial: Immersive ParaView: New immersive visualization capabilities

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Abstract

ParaView is a well-established tool in the scientific visualization community, equipped with many rendering techniques, selection controls, and data format readers. Many experts already rely on ParaView to accomplish a variety of data analysis tasks. ParaView's interface to virtual reality systems has recently expanded both for consumer-facing VR systems, as well as larger CAVE-style installations (as well as mid-range systems). The primary focus of this tutorial is on the immersive visualization features of ParaView's latest releases, which will cover how to setup and configure ParaView for virtual/extended reality, the basic immersive user interface, the shared-user collaborative interface, as well as the more advanced opportunities afforded by the Python connection to the VR capabilities.

Description

This tutorial is primarily to demonstrate how the ParaView scientific visualization tool can be used with HMD and CAVE-style VR displays. During the past two years, many advances have been made to ParaView's immersive interfaces, and most users of ParaView will likely either be unaware that the features exist, or perhaps unfamiliar with how to put them to use.

This tutorial will present how to use ParaView both with HMD and CAVE-style systems, including how to setup and configure ParaView for immersion, how to initiate the VR process, and how to perform visualization tasks while immersed. The tutorial will then go beyond the basic immersive interface and demonstrate how to use the collaborative features where immersed VR users can occupy the same visualization world and interact with each other. Another advanced feature is the ability to use Python scripts to add new features to the VR interface, allowing ParaView users to

easily write new custom interactions.

To accommodate participants who are interested in immersive visualization, but have not yet experienced ParaView, we will begin with a brief overview of ParaView's overarching visualization features and interface capabilities. During the tutorial, live demonstrations will be conducted both for the HMD/headset form of VR, as well as CAVE-style VR, for which, the presenters will bring a single-screen fishtank VR system that can be setup in an hour.

Objectives

The objective of this tutorial is to inform ParaView users, or anyone interested in ParaView to learn how to use the newly developed and enhanced immersive visualization features. Using these features does not require advanced knowledge of virtual reality, and thus will enable participants with different backgrounds to get up to speed quickly.

Intended Audience

This tutorial brings together ISVC Areas 3 (VR) and 4 (Visualization) as the sub-area often referred to as "immersive visualization". And will be of interest to attendees involved with either topic.

Duration

This will be a 3-hour half-day tutorial.

Organizers

William Sherman, National Institute of Standards and Technology,
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William Sherman is a Computer Scientist for the National Institute of Standards and Technology (NIST) in the High-Performance Computing and Visualization Group. He is interested in all types of immersive technology, scientific visualization methodologies, as well as the merging of the two. Prior to joining NIST, William worked on visualizations, both immersive and non-immersive for the Indiana University Advanced Visualization Lab. He established the Center for Advanced Visualization, Computation, and Modelling which housed both a 4-sided, and 6-sided CAVEs. At the National Center for Supercomputing Applications (NCSA), he led the technical efforts of the VR lab starting in 1993. In 1994 the NCSA VR lab constructed CAVE #2 with the assistance of the EVL team at the University of Illinois, Chicago. He has been working in VR for 30 years. William has also taught courses on virtual reality and scientific visualization to undergrad and graduate students for the University of Illinois at Urbana-Champaign, the University of Nevada-Reno, and Indiana University. Sherman is also the co-author or editor of four books on virtual reality.

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Simon Su (Ph.D., Houston, 2001) is a Computer Scientist in the High-Performance Computing Visualization Group at the National Institute of Standards and Technology (NIST). His research efforts have focused on Immersive Visualization. He is responsible for research and development of data visualization and 3D interaction using advanced immersive and interactive technologies. Before joining NIST, he was a Computer Scientist at the CDC Army Research Laboratory working on immersive visualization and analysis of data generated by users of the Department of Defense Supercomputing Resource Center. He has been working in the VR field for 21 years now.

Date

TBD