DATE: February 12, 2002

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TO: A. Habayeb

CC: Lance Arsenault, John Kelso, Fernando das Neves, and Chris Logie

SUBJECT: NAVCIITI Quarterly Report 18

RE: - Project 2.0   Visualization HCI and Collaboration
            - Task 2.1:   Command and Control Visualization
   SOW 2.1a.7: Demonstrate NUWC CONRAY model, Feb 02

Background: Our objective is to provide a distributed collaborative network of graphical and device independent tools in a shared virtual environment, which can be used by Command and Control (C&C) personnel to gain a strategic advantage. Specifically we focus on the mission critical C&C interpretation of acoustic undersea data from towed arrays for the Naval Undersea Weapons Center (NUWC) using the CONRAY simulation models. These simulation models can be extended to "real-time" data acquisition systems. Under the direction of personnel from NUWC and the Naval Research Laboratory (NRL) we have identified a working prototype which we have successfully incorporated into our Device Independent Virtual Environment Reconfigurable-Scalable-Extensible (DIVERSE) tool that works in stereo in the (C)AVE Automated Virtual Environment (CAVE), Immersive Work Bench (IWB), Immersive Desk (I-Desk), desktop workstation simulator, and Head Mounted Display (HMD) systems at the Virginia Tech Center for Virtual Environments and Visualization (CVEV). This effort has evolved and become part of the 3D Visualization Project called SUBV. A Web site for SUBV has been established: http://ait.nrl.navy.mil/people/dmaxwell/subv/

Activities redefined: On February 5, 2001 NUWC, NRL and VT agreed to coordinate efforts in a task break down which was described in the previous quarterly report #16. This effort has now evolved into the 3D Visualization project called SUBV. The SUBV Team is NUWC: K. Lima, R. Shell, S. Aguiar, Todd Drury, NRL: L. Rosenblum, D. Maxwell, VT: F. das Neves, C. Logie, L. Arsenault, J. Kelso. The "core" SUBV Team members (Shell, Maxwell, Kelso, das Neves, Logie) has met every two months at NRL, NUWC, or VT campus and participated in conference phone calls every two weeks.

Discoveries, Accomplishments, and Test Results as they relate to NAVCIITI SOW 2.1a.7

The SUBV prototype was delivered according to the schedule set in October 2001 by NRL, NUWC, and VT. Virginia Tech was in charge of writing most of the prototype. An image of the current SUBV interface is shown in Figure 1. This prototype implemented the 3D scene using Open Inventor, and the user interface using the FLTK toolkit. The application was divided into three areas:

- Data feeding.
- Scene visualization.
- User Interface Handling.

These areas are loosely coupled and so they support future modifications in data format, tactical display, and user interface implementation.

The prototype works on SGI's IRIX and Linux platforms, and so it validated the concept of using open source software to reduce costs, avoid license-locking, and enhance the ability to port the code to different hardware platforms.

Plans for Next Quarter:
- *Evaluate and modify NUWC CONRAY model, **March 02** which is consistent with the SUBV plan* Scenegraph implemented in OpenGL DIVERSE (01 Feb 02)

NUWC will coordinate NUWC and NRL efforts and interact with VT as required. VT will maintain regular communications with NUWC regarding the development of the SUBV interface.
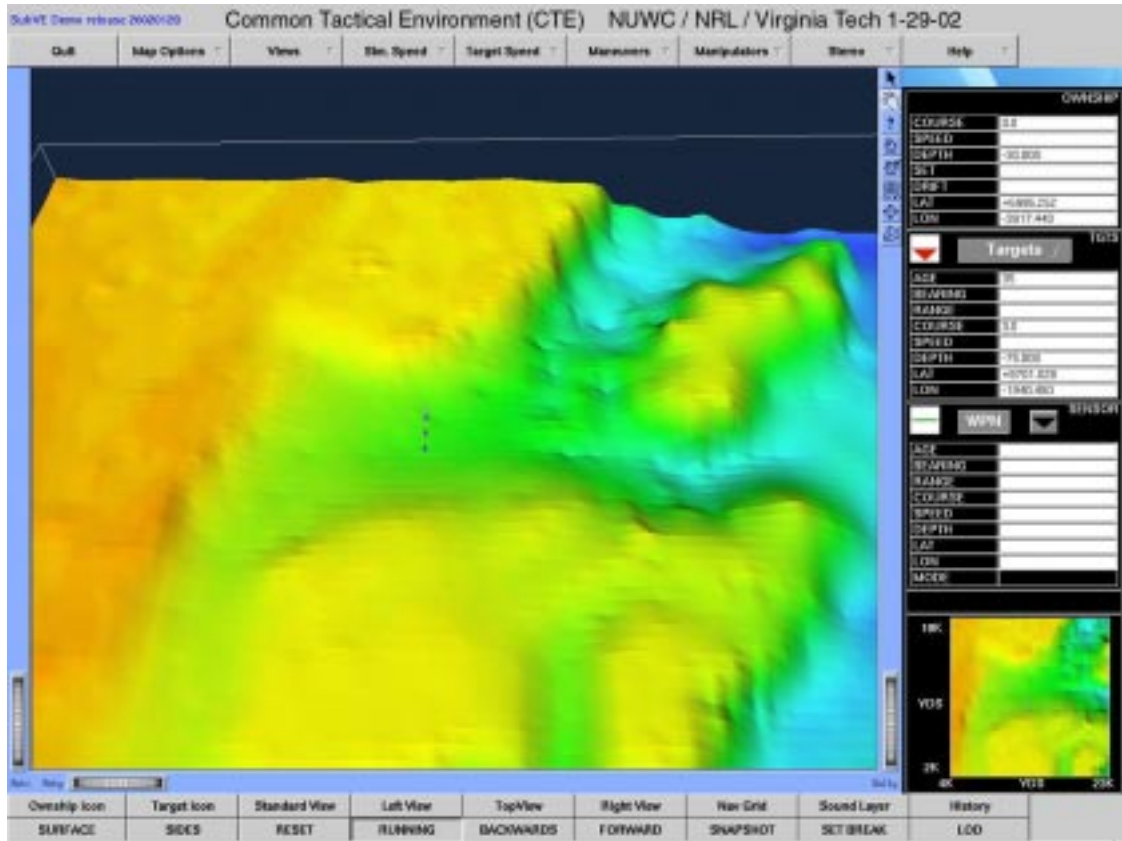
Outstanding Issues: none, on schedul

Figure 1. NRL, NUWC, and VT SUBV Interface, February 12, 2003