

Engineering Visualization Theater

The Engineering Visualization Theater (EVT) was established in 2001 as a venue in which to highlight important work being performed by LLNL's electronics and mechanical engineering personnel. It provides the infrastructure, tools, and visualization expertise necessary to help communicate engineering concepts through the production and presentation of high-quality audio/visual media.

As a presentation theater, the facility integrates a large projection video screen and surround audio system with a number of media sources including computer display output, digital disk recorder, VCR, DVD, and a video network feed from LLTN. Presenters can easily

patch a laptop computer into the system or use the resident hardware to display their material. The room provides seating for 10 to 15 people and provides an unclassified environment suitable for small-group collaborations, software demonstrations, or video presentations.

As a media production workshop, the facility also enables the creation of high-quality visualizations to help engineers better communicate their ideas. The intent is to enhance good engineering with the best possible media tools and presentation techniques. High-end animation, compositing, and image processing software staffed by knowledgeable operators, provide the tools and expertise necessary to achieve this goal.

The hardware for this project includes two computers, a large screen display, a digital disk recorder, an S-VHS video recorder, a video monitor, a DVD player, surround sound speakers, and an AV receiver.

Software includes 3-D animation, compositing, image processing, video editing, and DVD authoring.

Project Goals

The primary goal of the EVT is to assist engineers in communicating their ideas. Specifically, the EVT aims to provide the ability to fuse engineering analysis and data with professional animation to clearly articulate complex concepts.

Relevance to LLNL Mission

The need for good communication is ubiquitous and ongoing. LLNL's Engineering Directorate needs to be able to articulate its ideas and results in a modern venue commensurate

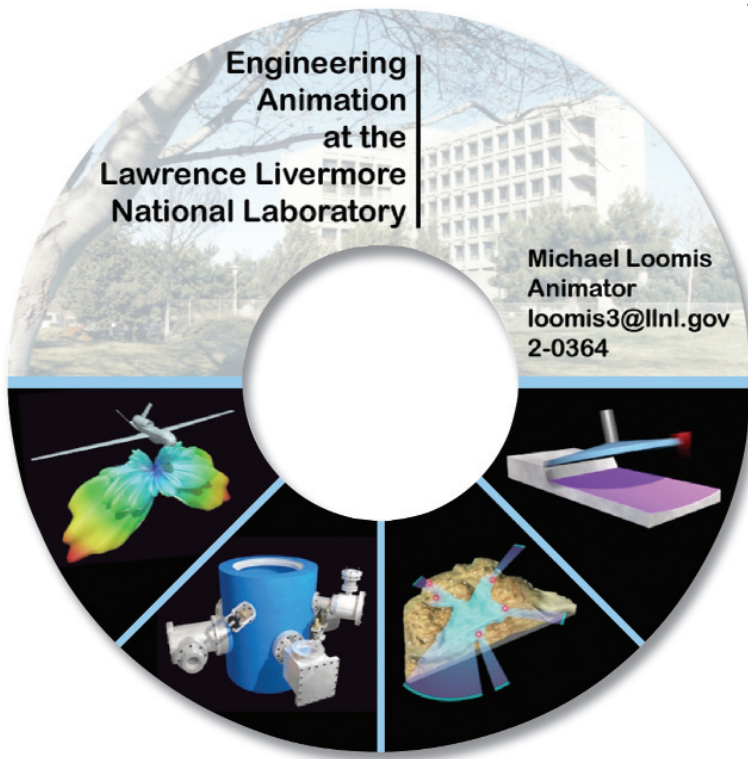


Figure 1. Sample of EVT graphics capability.



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with its abilities and those of its customers.

FY2005 Accomplishments and Results

EVT activities this year fall under three main categories: upgrades, marketing, and animation production.

Due to rising maintenance costs and creeping obsolescence, the aging SGI Onyx 2 system that once served as our primary animation production machine has been replaced with a more capable Apple G5. On the software side, improvements include upgrading to the latest version of Alias MAYA (V6.5) for animation/rendering. We also switched from Alias Composer to the Apple Shake system for compositing. These upgrades bring greater efficiency and new capability to the EVT.

Marketing efforts were increased this year in an attempt to expand the client base for the facility. As in previous years, we conducted in-house demonstrations for key Engineering personnel. A DVD entitled, "Engineering Animation at the Lawrence Livermore National Laboratory," was presented as a marketing tool to highlight animation projects created at the EVT.

Animation production activity this year included work for a number of clients in LLNL programs, on topics such as finite-element methods, adaptive urban dispersion modeling, hazardous materials bunker simulation, and tunnel failure simulations.

Like past EVT productions, we created movies that would:

1. fill a programmatic need;
2. demonstrate a path for visualizing computational results by incorporating actual data;

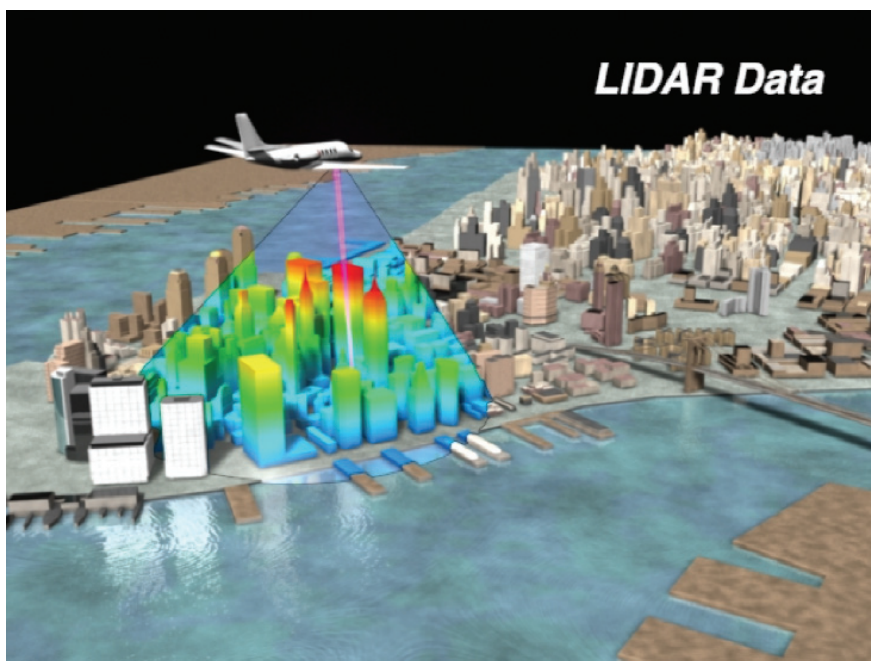


Figure 2. Sample of programmatic use of EVT's capabilities.

3. showcase various types of animation to illustrate the creative possibilities and techniques that are available for engineers to use in future animation productions; and
4. generally demonstrate the EVT's capability.

In each case, the result was a movie that brought engineering ideas to life in a form that was both instructive and visually compelling. By combining creative media production with the display capabilities inherent in the assembled hardware, we believe that these presentations demonstrate the potential for using the EVT as a tool to effectively communicate engineering concepts.

Figures 1 and 2 show samples of EVT's graphics capability.

FY2006 Proposed Work

The EVT intends to provide its services on an ongoing basis.