

FACT SHEET

UTSA Advanced Visualization Laboratory

Growing to Tier One

By focusing on research in health, energy, security, sustainability and human development, The University of Texas at San Antonio (UTSA) is quickly becoming a national research university. Many of the topics under investigation in these areas require UTSA researchers to interpret massive amounts of data in an easily comprehensible manner.

The UTSA Advanced Visualization Laboratory, established and managed by the College of Engineering, allows researchers from all disciplines of art, science and engineering to conduct simulation and visualization research to better understand complex phenomena and translate data into images on large-scale and high resolution visualization walls or other display devices. The laboratory supports UTSA's mission of teaching, research and community engagement and contributes to UTSA's goal to recruit the world's top computational researchers. UTSA faculty who are interested in utilizing the Advanced Visualization Laboratory should contact the College of Engineering.

Facility Features

The UTSA Advanced Visualization Laboratory is anchored by a 14.5-foot-wide by six-foot-tall **visualization wall** (Vis-Wall), a 98 Mpixel tiled display of two dozen 30" Dell UltraSharp Widescreen U3011 monitors. Each monitor boasts twice as many pixels as a high definition television.

The UTSA Advanced Visualization Laboratory is the only visualization laboratory in Texas to feature the Quanser HD2, a **high definition haptic device** with touch and feel for virtual models generated by computer simulations. The HD2 haptic device provides six degrees of freedom (6-DOF) motion and five degrees of freedom (5-DOF) force/torque feedback that allows researchers to precisely interact with sophisticated three-dimensional computational models. An **82" three-dimensional stereoscopic television monitor** enhances research conducted on the haptic device.

A **high-performance computing cluster**, comprised of 12 high-speed graphics-enhanced LINUX workstations comprising 144 CPUs and 24 NVIDIA® Quadro® FX 4800 graphics cards, drives the Vis-Wall. An InfiniBand communications network operating at 40 Gigabits per second connects the 12 computing nodes.

Additional features include Vis-Wall remote access, videoconferencing, a Smart board and classroom-style seating for 21 individuals.

Research Applications

The UTSA Advanced Visualization Laboratory will primarily be used by UTSA researchers in science, engineering and statistics who need to translate complex data sets into easily-interpretable graphic representations. Research projects slated for the Vis-Wall include:

- The development of cancer surgical simulation and real-time monitoring system
- Visualization of multi-scale modeling for computational biology and biomedicine
- The design and performance of autonomous underwater vehicles
- Fatigue and fracture of advanced structural systems
- Flash flooding research analysis
- Methods to predict the damage formation and failure of skeletal tissues

Funding

A three-year, \$482,600 grant awarded October 1, 2009 by the National Science Foundation

Contacts

Nancy Miller, UTSA Advanced Visualization Laboratory Coordinator

nancy.miller@utsa.edu | 210-458-6773

Yusheng Feng, Associate Professor of Mechanical and Biomedical Engineering, UTSA
Advanced Visualization Laboratory Director

yusheng.feng@utsa.edu | 210-458-6479

Harry Millwater, Associate Professor of Mechanical Engineering, UTSA Advanced
Visualization Laboratory Co-Director

harry.millwater@utsa.edu | 210-458-4481

Haptic Device: Brent Nowak, UTSA Associate Professor of Mechanical Engineering

brent.nowak@utsa.edu | 210-458-6772

Technical Questions: Johnny Melendez, UTSA IT Project Manager

johnny.melendez@utsa.edu | 210-458-5559