

+ Accelerating Insight Through Visual Collaboration

The Issue

The ability to compete and prosper in the information age requires the ability to easily work with remote partners, share large data files, aggregate and analyze data, develop advanced computational models, and visualize information for analysis, education, and decision making. Simply stated, the states and regions that can attract and retain talented workers, catalyze and grow new businesses, and solve problems effectively and efficiently are those equipped with a infrastructure for computing and communications that can be used in academic, educational, business and government settings.

RENCI Projects

RENCI has designed, built and deployed visualization facilities across the state, connected via high-speed networking, that are arguably the best, most advanced collection of visualization and collaboration resources in the country. The institute's 13 facilities in seven regions provide the campuses and their community partners with unprecedented tools for analyzing and visualizing data, educating students, collaborating with colleagues and creating new forms of art. RENCI visualization facilities include high-definition, multi-projector wall display systems, 3D and telepresence systems, multi-touch systems with interfaces similar to the iPhone, and a high-resolution dome. These facilities, part of the RENCI virtual organization, connect to each other and to national and international research and education communities through some of the fastest networks available, giving all who partner with RENCI the opportunity to share their ideas and discoveries with a worldwide audience.

One RENCI visualization facility—the Social Computing Room (SCR) at UNC Chapel Hill—offers a unique 360-degree viewing experience in a space about the size of medium-sized conference room. The SCR, designed and engineered by RENCI staff, allows groups from a wide range of disciplines to interact with large amounts of data displayed visually in ways that encourage discussion and discovery. For example, a UNC team conducting research into the causes of melanoma, the most deadly form of skin cancer, use the SCR weekly to analyze digitized melanoma biopsy slides. The international Archimedes Palimpsest project, a group examining ancient treatises by Archimedes, has provided its priceless manuscripts to RENCI so digitized versions of the texts can be viewed side by side and compared in the SCR. The North Carolina Museum of Natural Sciences modeled its Immersion Theater, a feature of its new Nature Research Center that will present scientific information to thousands of museum visitors, after the SCR. A graduate class in the nation's top-ranked UNC computer graphics department holds its weekly classes in the SCR.

Audiences outside academia and education also find the SCR a novel and useful environment. After previous visits to Cambridge and the MIT Media Lab, GSK held its 2008 worldwide IT staff fieldtrip at the RENCI UNC Engagement Center and conducted its pharmaceutical team meeting in the SCR. Microsoft uses the SCR to improve its InfoMesa collaboration tool for viewing multi-dimensional data. Most recently, the director of the NC Emergency Management Association visited the SCR and suggested using it as home base for the governor's yearly Emergency Operations Center exercise and as a model for the future NC state EOC.

The Expertise

RENCI visualization staff work with audiences across the state who use the engagement centers for research, education, data analysis and knowledge discovery. These RENCI experts also work to ensure users understand how the RENCI visualization and collaboration infrastructure can make it easy to collaborate with colleagues from other disciplines and at other sites. The facilities and the technological tools and expertise associated with them go well beyond the tools and capabilities available today at most universities and businesses. Many of the systems and software tools were designed and developed in-house by RENCI engineers and software developers.

The Partners

Duke University
East Carolina University
North Carolina Museum of Natural Sciences Nature Research Center
North Carolina State University
UNC Coastal Studies Institute
UNC Asheville
UNC Chapel Hill
UNC Charlotte

The Impact

To faculty members with innovative ideas and research projects that coincide with RENCI's mission of solving state problems, the RENCI virtual organization's visualization systems are a rich resource that offer a unique collection of technological resources and skilled staff. Together, these resources allow faculty to take their research to new heights, visualizing and solving problems important to North Carolina and gaining more knowledge in less time by analyzing data quicker and in more intuitive formats. Because the RENCI resources are so advanced, the RENCI engagement centers can serve as recruiting tools and can provide an advantage when North Carolina universities compete for major research dollars from federal agencies. These facilities enrich the educational experience for university and for K-12 students, many of whom need to see how exciting science can be so they will study technical and scientific curricula as they grow older.

Government has already shown an interest in using RENCI facilities to better perform important functions and are using RENCI as a model for some of their own new facilities. In little more than two years, RENCI's virtual organization and the visualization resources available through it has provided North Carolina with a unique resource that faculty, students, government officials and the business sector have been eager to use.