

## Case Studies: How Faculty Leverage UB's Robust IT Infrastructure to Advance Research, Instruction and Service

UB has strategically invested in building its core technology infrastructure to advance its missions. UB faculty are using this ubiquitous and advanced IT infrastructure to

- o Transform instructional programs and prepare students for work in the 21st Century
- o Enable researchers to tackle previously unsolvable problems and participate in national laboratories and global collaborations
- o Share UB technology and expertise with other institutions and the private sector in Western New York and New York State

The following examples show just a few of the ways faculty leverage IT at UB.

### SERVICE AND OUTREACH

	Goals	Infrastructure
<p><b>ECONOMIC DEVELOPMENT — Industrial Outreach: Technology Transfer to Western New York</b> CCR, NYSCEDII, and other UB units support outreach efforts that involve local companies and institutions, including Roswell Park, Hauptmann-Woodward Medical Institute, TVGA (Elma), Bergmann Associates (Rochester), IBC Digital (Buffalo), 3DScape (New Jersey), various DOTs, New York State Thruway Authority, Peace Bridge Authority, the Buffalo Medical Campus, Praxair, Moog, General Dynamics, MTV, and Meritool. Work includes urban simulation and design, traffic accident reconstruction, and high-end computer-generated imagery.</p>	<ul style="list-style-type: none"> <li>o WNY Economic Development</li> <li>o Technology transfer to WNY private and public sector organizations</li> </ul>	<ul style="list-style-type: none"> <li>o High performance computing environment</li> <li>o Simulation, modeling, visualization tools</li> <li>o Large scale data repositories, data management</li> <li>o Data mining tools</li> </ul>
<p><b>3D VISUALIZATION: Medical Imagery</b> The CCR, working with Children's Hospital and their leading miniature access surgery center team, has been developing software to improve the 3D reconstruction of medical images. The CCR also works with the Buffalo Neuroimaging Analysis Center to improve the visualization of MS patient brain scans.</p>	<ul style="list-style-type: none"> <li>o Improve 3D reconstruction of medical images and visualization of brain scans</li> </ul>	<ul style="list-style-type: none"> <li>o Visualization tools</li> <li>o Software developers</li> <li>o High performance computing environment</li> </ul>
<p><b>SHARING IT RESOURCES &amp; EXPERTISE — Sharing with K-12</b> CCR has run a 2-week summer high school workshop to introduce students to computational science each year since its inception. In addition, the CCR has reached out to 3 area high schools, Mt. St. Mary's Academy, Buffalo City Honors High School, and Orchard Park High School, to train students and teachers in offering a bioinformatics program as part of their school year programs.</p> <p>External Funding: Verizon and HP</p>	<ul style="list-style-type: none"> <li>o Workforce development: helping to ensure US global competitiveness</li> <li>o Introduce students to computational science</li> <li>o Introduce students to careers in science and engineering</li> </ul>	<ul style="list-style-type: none"> <li>o High performance computing environment</li> <li>o Simulation, modeling, visualization tools</li> <li>o Data management and mining tools</li> </ul>

	<b>Goals</b>	<b>Infrastructure</b>
<p><b>SHARING IT RESOURCES &amp; EXPERTISE — Sharing with Western New York Institutions: Western NY Grid</b></p> <p>UB has recently received a \$1M NSF grant to establish the WNY grid which will allow UB to share its HPC and other resources with SUNY Geneseo and Niagara University. Students at these institutions will have access to UB's HPC, high end data storage, visualization, data mining, and other tools needed for their education. UB is also promoting grid awareness and developing a grid computing curriculum that other schools will be able to use.</p>	<ul style="list-style-type: none"> <li>o Introduce students to grid computing</li> <li>o Share UB's resources, expertise, and infrastructure with schools lacking the infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>o Grid Infrastructure</li> </ul>
<p><b>SHARING IT RESOURCES &amp; EXPERTISE — Sharing and collaborations with NY State Higher Education Institutions</b></p> <p>CCR leads a grid-computing project, working with Columbia University, Niagara University, Buffalo State College, Canisius College, SUNY-Geneseo, SUNY-Brockport, SUNY-Binghamton, SUNY-Albany, Hauptman-Woodward Medical Research Institute, and a number of other NY state schools and institutions.</p>	<ul style="list-style-type: none"> <li>o Sharing resources</li> <li>o Fostering collaborations</li> </ul>	<ul style="list-style-type: none"> <li>o CCR grid computing infrastructure and tools</li> </ul>
<p><b>WNY Shared Health Information Project:</b> This project is focused on development of a secure community-wide health care database, bringing both economic and health benefits to the region.</p> <p>Partners include the CCR, School of Informatics, School of Medicine, the Buffalo Academy of Medicine, Erie County Department of Health, State Department of Health, Kaleida, ECMC, Catholic Health System, Independent Health, HealthNow, Univera, and WNY HealthNet.</p> <p>Funding NIH</p>	<p>Specific goals include</p> <ul style="list-style-type: none"> <li>o Developing an electronic patient medical record that follows the patient</li> <li>o Providing care providers with real-time patient information</li> <li>o Providing a tool to aid agencies in community safety, epidemiology, resource allocation, and bioterrorism.</li> </ul>	<ul style="list-style-type: none"> <li>o Large Scale Databases</li> <li>o Data Management</li> <li>o Data Mining, and Visualization Tools</li> <li>o Computer security infrastructure</li> </ul>