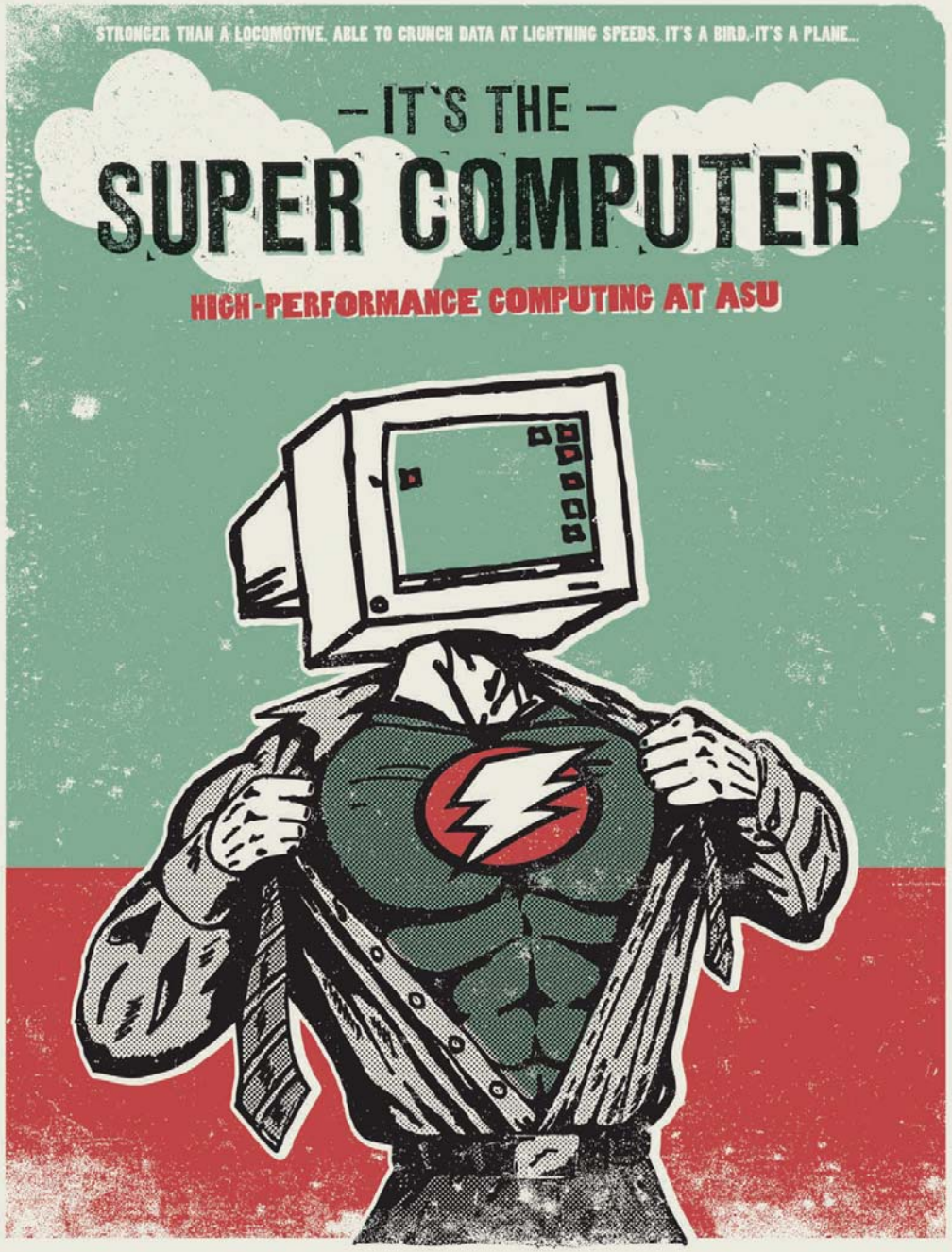
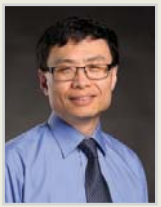


Cutting-edge technology is a key attribute of top-tier institutions of higher education. Access to new technologies is imperative for students pursuing careers in computer sciences and mathematics where breakthroughs depend upon new technologies. Competitive computing capacity is vital to researchers, educators and innovators in today's job market.

ASU gained such technology when a consortium of seven institutions submitted the CI-TRAIN proposal to the National Science Foundation in 2008. This successful proposal expanded cyberinfrastructure by connecting people, knowledge databases, computers, software tools and hardware equipment.

ASU leveraged this award, with funding from the Arkansas Science and Technology Authority, the College of Engineering, the College of Sciences & Mathematics, and Information Technology Services to purchase a Dell five-node cluster and built a High Performance Computing (HPC) platform. Comprising 3,628 cores and more than 18 terabytes of storage, it was the largest Graphics Processing Unit (GPU) cluster in Arkansas at the time of its installation.

Visit our website for more information: www.ci-train.org



Hai Jiang

EXPANDING POSSIBILITIES

Hai Jiang, associate professor of Computer Science, is Arkansas State University's "campus champion" for CI-TRAIN, representing ASU in the 2008 proposal process. In 2011, Jiang's vision of the research and educational impact of improved cyberinfrastructure was realized with the arrival of the platform.

Regarding applications, Jiang helps researchers in other fields understand the potential of the platform by establishing a Compute Unified Device Architecture (CUDA) Teaching Center at ASU. At its inception, this center was one of only 12 centers in the United States, as recognized by major GPU manufacturer NVIDIA.

"It's the trend...nobody can stop it. As ASU makes strides toward becoming a research-intensive university, an HPC platform is a must-have."

Jiang is familiar with the need for such capacity in today's rapidly advancing world. "It's the trend," Jiang said. "Nobody can stop it. As ASU makes strides toward becoming a research-intensive university, an HPC platform is a must-have."

Maximizing utilization is critical. Jiang's research focuses on HPC software development and applications, centering on 'cloud computing' and 'pervasive computing' integration. Jiang's goal is for faculty, staff and students to use local, private clouds for data storage and exchange.

Jiang also teaches an HPC course each year, providing learning opportunities for students and faculty such as Hideya Koizumi, assistant professor of Chemistry, and Hong Zhou, assistant professor of Statistics.

"CI-DAYs" AT ASU

As part of the CI-TRAIN agreement, partner institutions take turns hosting Cyberinfrastructure Days (CI-DAYs) to present innovations, disseminate knowledge about cyberinfrastructure and bring together a variety of interested parties. ASU's CI-DAYs for Transformational Scientific Discovery were held on Oct. 30-31, 2011.

Innovations in several areas were presented:

1. "Medical Animation," presented by Robert Krensel, Marketing vice president of XVIVO, one of the first companies to focus solely on the development of customized medical and scientific 3D animation.
2. "Global Climate Modeling," presented by James B. (Trey) White III, software engineer at the National Center for Atmospheric Research.
3. "Rome Reborn," presented by Bernard Frischer, director of the Virtual World Heritage Laboratory, an international initiative whose goal was the creation of 3D digital models illustrating the urban development of Ancient Rome.

For more information and to watch an ASU-produced video, scan this QR code with your smart phone.

arkansas state university : the measure of success

FACULTY & STUDENT OPPORTUNITIES

Koizumi's research involves predicting and simulating the movement of particles. His studies include very large amounts of data. "Currently," Koizumi said, "a lot of approximation is done with regard to predicting the properties of particles, but details are better. With details, we can get a more precise solution." Researchers are pleased with possible shortened calculation times, as HPC could reduce certain particulate calculations from a year to a day.

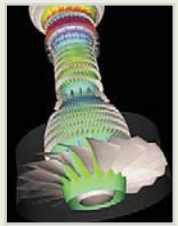
Koizumi also emphasizes the importance of HPC capabilities on students' exposure to cutting-edge research, thus greatly enhancing graduate-program and marketplace competitiveness.

Zhou's research explores the optimal design of experiments, with applications in areas like engineering, chemistry and business. One of his students works with HPC resource management and programming, an area known by only two or three percent of researchers. Other students want to gain first-hand understanding of research and cutting-edge technology.

LOOKING FORWARD

John Pratte, interim dean for the College of Sciences and Mathematics, summed up the future for collaboration and research. "This system allows scientists, mathematicians and engineers to study a wide range of problems that are vitally important to both our community and the world at large in a shared environment that maximizes resources."

The HPC platform at ASU is making a significant impact and will continue to do so as more people at ASU and beyond become aware of the transformative possibilities this technology provides.



High performance computing has applications in diverse environments, like physics and biosciences, engineering, medical imaging, virtual reality, data mining and collaborative work settings.

"Researchers are pleased with possible shortened calculation times, as HPC could reduce certain particulate calculations from a year to a day."