



## National Visualization and Analytics Center

January 17, 2006

### Purdue and Indiana University's School of Medicine selected for DHS national visualization team

WEST LAFAYETTE, Ind. — A team comprised of Purdue University and Indiana University's School of Medicine has been named a Regional Visualization and Analytics Center by Pacific Northwest National Laboratory in Richland, Wash. PNNL leads the Department of Homeland Security's National Visualization and Analytics Center ([nvac.pnl.gov](http://nvac.pnl.gov)), or NVAC™, which is bringing academic expertise to the nation's efforts to discover information that may warn officials of a terrorist attack.



The team's center, or PURVAC, will perform research that will allow personnel at all levels of homeland security to quickly and effectively extract, visually analyze and synthesize information so that they can make quick and accurate decisions. The PURVAC team will focus on three homeland security areas: intelligence analysis; emergency planning and response; and healthcare monitoring and management.

The Purdue and IUSM partnership is one of four university team selections announced today. The others are the University of North Carolina at Charlotte and Georgia Institute of Technology, University of Washington, and Pennsylvania State University. Stanford University was named another regional center in early 2005.

DHS established the NVAC™ in 2004 to provide scientific guidance and coordination for the research and development of new tools and methods that DHS has identified as required for managing, visually representing, and analyzing enormous amounts of diverse data and information. Development of these visualization tools will enable analysts to more effectively identify signs of terrorist attacks in their earliest stages and ultimately prevent terrorist activities before they occur. The four core responsibilities of the NVAC™ are research and development; education; technology evaluation and implementation; and integration and coordination of research programs across government agencies.

"The Purdue-ISUM team's proposal includes world-renowned researchers in electrical and computer engineering, computer science, management, statistics and medicine," said Jim Thomas, PNNL's chief scientist for information technologies and NVAC™ director. "In addition, the existing Purdue University Rendering and Perceptualization Lab meets several DHS needs, demonstrating that they have the capabilities and expertise that are integral to our efforts for NVAC."

"The complexity and massive amounts of data and the variety of sources from which it comes imposes unique challenges," added Thomas. "The goal of the center is to turn this sea of data into functional information to help users perform their jobs effectively."

"The general idea is to tightly integrate analysis, abstraction and visual representation to enable an effective decision-making environment," said David Ebert, professor of electrical and computer engineering and principal investigator of PURVAC. "For instance, in the event of a catastrophic event, such as a chemical spill, natural disaster, disease outbreak or a terrorist attack, information will be coming from many sources – including images from cameras, data from sensors and simulations, and text documents from police and healthcare agencies."

“It’s hard for people to manage and analyze massive quantities of data in a timely manner, so the team will combine advanced visualization and simulation tools with techniques in areas such as statistics, data retrieval and database technology so that we create a comprehensive picture for the person who needs to make the decision.”

Ebert says in terms of something tangible, such as software, the team’s greatest challenge will be creating a system that not only integrates different kinds of data, but also presents the information in ways that analysts, decision makers and emergency workers using various types of displays and requiring different kinds of information can readily see and understand.

“It isn’t that you take all the data and present it the same way to everybody. Instead, you really need to extract the relevant data and tailor how you display the information for each person, their task, and for the capability of their display,” Ebert said. “If they have a cell-phone-type device or a PDA, you can’t effectively display things the same way you would for large screens on desktops.”

In the area of healthcare monitoring and management, the team will develop advanced analytical tools to monitor and quickly recognize the signs of biological and chemical incidents.

The interdisciplinary team will consist of about 20 Purdue faculty and graduate researchers from the School of Electrical and Computer Engineering, the Departments of Computer Science Statistics, and the School of Management. The Center will be affiliated with four facilities in Purdue’s Discovery Park, the university’s hub for interdisciplinary research: the Purdue Homeland Security Institute, Cyber Center, e-Enterprise Center and Regenstrief Center for Healthcare Engineering.

The PURVAC will also collaborate closely with the Indiana University School of Medicine, with Dr. J. Marc Overhage as the primary researcher, Indiana Department of Homeland Security and the Indiana State Department of Health, as well as researchers at Simon Fraser University and The University of Stuttgart.

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Discovery Park is Purdue’s hub for interdisciplinary research and currently includes five buildings encompassing several centers: the Burton D. Morgan Center for Entrepreneurship, the Birck Nanotechnology Center, the Bindley Bioscience Center, the e-Enterprise Center, the Center for Advanced Manufacturing and the Discovery Learning Center. Purdue was founded in 1869 and named after benefactor John Purdue. The university has a total enrollment of 69,098 students at five campuses and numerous teaching and research sites, with 38,712 students at its main campus in West Lafayette, Ind.

The Indiana University School of Medicine, the second largest medical school in the nation, is dedicated to promoting health in the state of Indiana and beyond through innovation and excellence in education, research and patient care. As the state’s only medical school, the IU School of Medicine has more than 1,300 students who are educated at nine centers across Indiana. More than 1,200 faculty advance the School’s mission and promote life sciences in the Hoosier state.

Pacific Northwest National Laboratory ([www.pnl.gov](http://www.pnl.gov)) is a DOE Office of Science laboratory that solves complex problems in energy, national security, the environment and life sciences by advancing the understanding of physics, chemistry, biology and computation. PNNL employs 4,100 staff, has a \$700 million annual budget, and has been managed by Ohio-based Battelle since the lab’s inception in 1965.

The U.S. Department of Homeland Security’s Science and Technology Directorate serves as the primary research and development arm of the Department, utilizing our nation’s scientific and technological resources to provide federal, state and local officials with the technology and capabilities to protect the homeland.

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