



Homeland Security

Science and Technology

Center for Visualization and Data Analytics (CVADA)

A DHS Emeritus Center of Excellence*

CVADA creates enduring technologies to analyze large quantities of information in support of real-time decision making across the homeland security enterprise.

LAUNCH ▶ 2009

PARTNERS ▶ More than 40 university, private industry, and government partners

EXPERTISE ▶ Visualization and computer graphics, data analytics, engineering, computer science, geographic information systems, cognitive psychology, information technology, and emergency management

DHS ALIGNMENT ▶ U.S. Coast Guard, Transportation Security Administration, U.S. Immigration and Customs Enforcement, Federal Emergency Management Agency, U.S. Customs and Border Protection, Countering Weapons of Mass Destruction Office

Feedback from Our Partners

*“VALET [Visual Analytics Law Enforcement Toolkit] helped greatly in isolating the crimes inside the area in question and also provides a heat map to readily see busy areas. **We are fortunate to have a good tool like this.**”*

Lieutenant Alan Yeager
Evansville Police Department, 2017

*“We have been utilizing SMART [Social Media Analytics and Reporting Toolkit] since [the presidential] inauguration last year and it has become a **standard part of our special event intel support package.**”*

LTJG Nicholas Phillips, U.S. Coast Guard
Sector Maryland - National Capital Region Intelligence, 2018

*“We believe the Crowd Management Simulation for the Bus Terminal in NYC will be a **very powerful tool during future modifications** to the terminal, as well as in the overall management of hundreds of thousands daily passenger-trips.”*

Joaquin Gonzalez, Assistant Director, Priority Capital Programs
Port Authority of New York and New Jersey, 2017

*DHS Emeritus Centers of Excellence no longer receive base grant funding. DHS and its operational components can access Emeritus Centers through DHS Basic Ordering Agreements (BOAs).



Research and Education Capabilities

- Investigative analysis and anomaly detection
- Trend identification and predictive analytics
- Spatiotemporal exploration and visual analytics
- Risk-based decision making and resource allocation
- Education and training for the current and future homeland security workforce

VACCINE

Visual Analytics for Command, Control and Interoperability Environments
A U.S. Department of Homeland Security
Science and Technology Center of Excellence

Visual Analytics for Command, Control, and Interoperability Environments (VACCINE) Center

A nationwide consortium co-led by:

Purdue University
500 Central Drive, POTR 127
West Lafayette, IN 47906

✉ vaccine@purdue.edu

🌐 <http://www.purdue.edu/discoverypark/vaccine/>

☎ (765) 496-3747



Command, Control and Interoperability for Advanced Data Analysis (CCICADA) Center

A nationwide consortium co-led by:

Rutgers University
96 Frelinghuysen Road
Piscataway, NJ 08854-8018

🌐 www.cicada.org

☎ (848) 445-5928

University Partners

American Military University, WV
Arizona State University, AZ
Carnegie Mellon University, PA
Florida International University, FL
Georgia Institute of Technology, GA
Howard University, D.C.*
Morgan State University, MD*
Oak Ridge National Lab, TN
Oxford University, U.K.
Pennsylvania State University, PA
Prairie View A&M University, TX*
Princeton University, NJ
Purdue University, IN
Tennessee State University, TN
Texas Southern University, TX*
The City College of New York, NY
Tuskegee University, AL*
United States Air Force Academy, CO
University of Illinois, Urbana
Champaign, IL
University of Maryland, MD
University of Massachusetts, MA
University of North Carolina at
Charlotte, NC
University of Southern California, CA
University of Texas at San Antonio, TX
University of Texas, Austin, TX

*Minority Serving Institution (MSI)

Enterprise Partners

Alcatel-Lucent Bell Labs
Applied Communications Sciences
AT&T Labs
Charlotte Mecklenburg Police
Department
Davista Technologies
Evansville Police Department
Geosemble Technologies
Indiana Intelligence Fusion Center
Lafayette Police Department
Purdue Police Department
Tippecanoe Sheriff's Department
Tippecanoe County EMA
United States Air Force Academy
West Lafayette Police Department

Impacts



Developing social media analytics tools for big data

Several DHS components have deployed the Social Media Analytics and Reporting Toolkit (SMART), a social media analytics tool that allows users to map and navigate data in real time by using key words, examining anomalies, and exploring geographic distribution of information. SMART has been used at many special events, such as the 2017 Presidential Inauguration. Davista Technologies is commercializing SMART, developed by CVADA at Purdue.



Deploying visual analytics for crime detection

The Visual Analytics Law Enforcement Toolkit (VALET), an interactive analysis interface for crime incidents, was deployed by CVADA at Purdue to several law enforcement agencies and commercialized by Davista. VALET depicts real-time events as well potential scenarios, enabling law enforcement agencies to interactively visualize and analyze their datasets in linked geospatial maps and time graphs.



Best practices and simulation tools help protect stadium fans from terrorist threats

Stadiums from almost every professional sports league are using patron screening and evacuation simulation tools developed by CVADA at Rutgers in partnership with Regal Decision Systems Inc. The tools enable public safety and emergency managers to select the screening and evacuation methods likely to work best at a particular venue. Sports arena security managers also use CVADA's analyses to assist with their SAFETY Act certifications.



Detecting false distress calls to prevent threats

The U.S. Coast Guard (USCG) receives more than 100 phony distress calls per year, which can be costly and endanger first responders, diverting manpower and equipment from critical missions. CVADA at Rutgers applied voice forensics to help USCG catch and prosecute these hoax callers.

For a complete list of partners and more information, please visit <http://www.purdue.edu/discoverypark/vaccine/index.php> or www.cccada.org

For more information on DHS Centers of Excellence, please visit www.dhs.gov/science-and-technology/centers-excellence