

DHS Science and Technology Directorate Centers of Excellence

Enhancing the USCG's Operational Effectiveness With COAST

Suite of tools will help optimize USCG operations

Researchers from the Center for Visual and Data Analytics (CVADA), a Department of Homeland Security (DHS) Science and Technology Center of Excellence, are working closely with the United State Coast Guard (USCG) to develop the **Coastal Operations Analysis Suite of Tools (COAST)** based on USCG mission requirements. This suite of tools will include visualization, simulation, math modeling, and optimization techniques.

USCG partnership key to developing COAST

COAST is being developed with assistance from the USCG to help USCG leaders and decision makers more effectively analyze a range of mission demands and individual operational unit tasks related to asset capabilities, acquisitions, and allocations; unit locations; policies and concepts of operations; and mission tradeoffs. COAST will incorporate several analytical tools, each designed to address a mission or operational unit. These tools will be able to interface with each other.



First three COAST tools in development

In 2012, researchers expect to complete three modules for COAST that will analyze boat station operations.

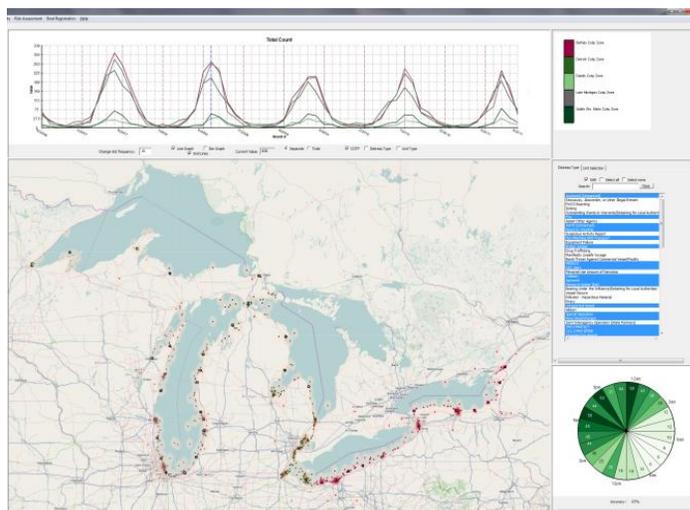
- The *Boat Allocation Module* will help users optimize the number of boats needed to accomplish missions at each station.
- The *Boat Station Search and Rescue Module* will help users analyze boat station performance of search and rescue operations, calculate operational effectiveness, and evaluate the impact of changes to asset capabilities or search and rescue policy.
- The *Boat Station Ports, Waterways, and Coastal (PWCS) Security Module* will help users assess operational needs and ensure there are adequate resources to meet the PWCS mission.

Projected benefits of using COAST

- Will incorporate and integrate existing USCG tools;
- Can be used across USCG missions and districts; and
- Will be able to perform multiple functions such as resource allocation, risk and vulnerability assessment, activity scheduling, trend analysis, training simulations, decision support, and impact on operational effectiveness with changes in policy and programs.

Initial success with cgSARVA

COAST expands on the geographic applicability of a previously developed tool, the Coast Guard Search and Rescue Visual Analytics* (cgSARVA), which CVADA developed with the USCG specifically for the Great Lakes region. The cgSARVA suite of tools provides an interactive visualization, analysis and assessment of search and rescue missions. It also helps decision makers and analysts understand the risk, efficiencies and benefits related to the reallocation or reduction of various types of resources. The Ninth and Fifth USCG Districts and the USCG Atlantic Area Command currently use cgSARVA.



Screen shot of the cgSARVA tool showing analysis in the Great Lakes region

* The Center for Visual Analytics for Command, Control and Interoperability, which co-leads CVADA, received a Commander Atlantic Area's Excellence Coin for its work developing cgSARVA with USCG District Nine.



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To learn more about COAST, contact Joseph Kielman, Program Manager, at joseph.kielman@hq.dhs.gov.

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Enhancing Community Safety: Gang Graffiti Automatic Recognition and Interpretation (GARI) System

Mobile app fights gang violence

Law enforcement officials are using the **Gang Graffiti Automatic Recognition and Interpretation (GARI)** system, developed by the Department of Homeland Security (DHS) Science and Technology Directorate Center of Excellence in Command, Control and Interoperability, to identify and track gang activity in their communities via mobile phones. More than 38 law enforcement officials from 11 departments and jurisdictions, including the Indianapolis Metropolitan Police Department, are field-testing GARI and helping to populate its database.

Gangs use graffiti to communicate messages, including challenges and warnings, or to intimidate rival gangs. Having handheld access to graffiti meanings and locations helps officers track gang affiliation, growth, membership and activity. The ability to track gang movements also helps communities develop strategies to mitigate gang activities.

Gangs are a serious threat to public safety. According to the 2011 National Gang Threat Assessment, as of April 2011, about “1.4 million gang members belonging to more than 33,000 gangs were criminally active in the United States.” Gangs commit about 48 percent of violent crime in most communities; in others, they are responsible for up to 90 percent of violent crime.

“GARI can really help the street officers”

- **Detective Steve Schafer, Criminal Gang Unit, Indianapolis Police**

“GARI is still in its infancy--but once this gets going, it's going to be beautiful--it will be very helpful and very useful. I love it--and I'm really excited about the possibility of using it with the prison population to identify tattoos. Tattoos are more specific because you can identify an actual person. GARI can really help the street officers because it's available 24/7--it's quick and instantaneous.”

GARI helps users:

- Determine when a new gang moves into an area;
- Identify what gangs are active in an area;
- Connect with youth at-risk of gang recruitment; and
- Prepare for potential outbreaks of gang violence.



How it works

GARI is a mobile device application that analyzes gang graffiti. A user takes an image of the graffiti and receives an analysis and interpretation of the gang affiliation and what the graffiti means. This repository of gang graffiti images gives users historical information and geographical locations of other images, helping to track gang movement.

GARI adds new images to a central database, records their GPS coordinates, and records the date and time the images were acquired. More than 500 gang graffiti images have been uploaded to GARI since the fall of 2011. GARI is available for the Android platform and has a web-based interface for use with other platforms such as desktop computers and mobile devices.

GARI for border security and other users

Border Patrol Agents, intelligence analysts, and National Fusion Centers could use GARI as a homeland security solution to track international gangs involved in drug trafficking, identity theft, counterfeiting, and human trafficking.

In local communities, school officials or neighborhood watch groups could use GARI as a crime fighting tool.

Public safety agencies or communities interested in participating in GARI should contact gari@ecn.purdue.edu.



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To learn more about the Gang Graffiti Automatic Recognition and Interpretation system, contact Joseph Kielman, Program Manager, at joseph.kielman@hq.dhs.gov.