DHS Science and Technology Directorate
Scalable Integration of Geo-dispersed Monitoring Assets

Video surveillance offers an abundance of data

Multitudes of camera phones, storefront video surveillance systems, network news and other installed cameras provided nearly 13,000 video clips of the 2013 Boston Marathon bombing. The Federal Bureau of Investigation (FBI) had 120 analysts poring over this footage for clues.

While the search to identify suspects was ultimately successful, the Department of Homeland Security, Science and Technology Directorate (S&T) is researching ways to shave critical time from the process of analyzing video from multiple sources, allowing authorities to more rapidly identify and apprehend persons of interest. S&T's Scalable Integration of Geo-dispersed Monitoring Assets (SIGMA) project will provide significant improvements in the time necessary to conduct a forensic video investigation.

Panning for valuable video data

SIGMA's goal is to improve the ability to access, search and analyze large amounts of video data from multiple camera systems. For example, a law enforcement agency may own hundreds or thousands of individual video cameras, making it difficult to search for a person, object, or vehicle across all of its cameras. The situation is further complicated since video cameras may be owned by multiple law enforcement agencies in a large city and video management software may not be compatible with other cameras.

To address this challenge, SIGMA will develop a means to ingest large amounts of video data from multiple camera systems—with multiple owners or operators, both private and public—for analysis. In addition, SIGMA will provide a library of analytic services that will improve incident investigation capabilities. Deployment of input-independent analytic capabilities reduces the need for manual conversion and improves response time. The SIGMA team will use existing, unattributable video submitted by various law enforcement agencies in the development of the system.

Establishing requirements

The project team is working with federal agencies, including the FBI, National Institute of Standards and Technology, and the Combating Terrorism Technical Support Office's Technical Support Working Group to assess state-of-the-art technologies and determine the path ahead. Presently, the SIGMA team is engaging with stakeholders to identify key requirements. An initial stakeholder meeting was held at the Massachusetts Institute of Technology's Lincoln Laboratory (MIT-LL) in July 2014 to understand various needs and policies presented by law enforcement communities and potential end-users.

Progressive expansion of capabilities

The project has successfully demonstrated a prototype system using a small sample of video analytic tools on offline video data collected from multiple cameras. The goal is to expand SIGMA in one to three years to include live video data from multiple camera systems and the capability of users to select analytics from a library of third party tools. The project would culminate with a functioning prototype SIGMA system in a major metropolitan area.

Boston Police Department control room (Photo courtesy of MIT/LL)

Partnerships key to SIGMA transition

SIGMA is being developed in partnership with MIT-LL with input from prospective users with roles in law enforcement and critical infrastructure protection. Key stakeholders include law enforcement agencies, transportation authorities, and DHS Centers of Excellence.

Homeland Security
Science and Technology

To learn more about the SIGMA project, contact sandt.rsd@hq.dhs.gov.

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