With support from the Air Force SBIR/STTR Program, a New York-based company developed a tool to remove classified data from video before it is shared with partner or host nations. The tool is being used at Air Force Special Operations Command, which provides highly-trained forces for worldwide deployment. (U.S. Air Force photo/Staff Sgt. Melanie Holochwost)

IMPROVED VIDEO PROCESSING
CAPABILITY TO ENHANCE KEY INTERNATIONAL SUPPORT

The Air Force has a new way to share critical mission video footage that will bolster the confidence of allies while protecting classified information.

With support from the Air Force Small Business Innovation/Small Business Technology Transfer Program, New York-based Kitware Inc. created a tool for operational analysts to remove embedded, sensitive data from full-motion video before it is distributed to partner or host nations. Unlike traditional methods that cover sensitive material with black boxes, comparable to redacting information on paper documents, this new technology helps preserve the integrity of the video images.

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Kitware's "burn-out" tool has been used in limited situations by Air Force Special Operations Command and is in the process of being accredited for more widespread use within that organization.

Originally, the company was working on a SBIR/STTR project with another federal agency to develop the core video processing technology for a different purpose. That's when officials from the Air Force Research Laboratory saw the potential for applying it to video intended for sharing.

ADDRESSING A UNIQUE NEED

Some situations at Air Force Special Operations Command warrant the providing of mission video to other countries. For example, the Taliban has been known to falsely claim that civilians were injured or killed during the capture of a high-value target. In those types of cases, providing partner and host nations with aerial video of the true sequence of events is beneficial to U.S. interests.

The problem is that embedded – sometimes referred to as "burned-in" – data in the original video contains classified information. Using the traditional method to sanitize the video, which produces large swaths of blacked-out areas, can give the appearance that relevant footage is being hidden. Kitware's burn-out tool can be used to create a high-quality version of the footage with the sensitive information removed.

"Air Force Special Operations Command needed the ability to distribute video in a more releasable format," said Juan Vasquez, a principal research electronics engineer with AFRL's Sensors Directorate during the development of the tool. "The burn-out tool is mitigating an operational artifact that doesn't exist in normal video."

BEHIND THE TECHNOLOGY

Kitware's burn-out tool is used to detect embedded data at the pixel level, then blend neighboring pixels from previous and future frames to intelligently cover it. The process overwrites data with new information, therefore the classified information cannot be retrieved after the footage is distributed.

"It looks better, and is more credible while still protecting the secure information," said Vasquez, who is currently working within AFRL's Airman Systems Directorate.

Originally, the technology was designed for a computer to perform all the work behind the scenes. Air Force SBIR/STTR funding enabled Kitware to develop the algorithm, make advancements in image processing techniques and modify the interface for its use directly by operational analysts at Air Force Special Operations Command.

ECONOMIC IMPACT

In addition to delivering a new technology, Kitware honed its expertise by working with Air Force analysts who specialize in video processing, exploitation and dissemination. The company is leveraging that experience to solve problems for other customers on different SBIR/STTR projects.

Kitware was also exposed to a new market for its open-source technologies, increasing the company's potential to grow revenue and add jobs. That's important because a key tenet of the Air Force SBIR/STTR Program is to boost the national economy through small business growth.

U.S. AIR FORCE

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