MOTION VIDEO EXPLOITATION
SITUATIONAL AWARENESS IN A DYNAMIC ENVIRONMENT

CONDITIONS ON THE GROUND can change in an instant, and national security depends on up-to-the minute situational awareness. As military and intelligence agencies intensify efforts against terrorism and asymmetrical warfare, new technologies for detecting, tracking, and targeting threats to populations and critical infrastructure play an important role. To advance these efforts, agencies are discovering the benefits of incorporating video data sources, such as those from unmanned aircraft systems (UAS), into existing analytical models.
Unmanned aerial vehicles (UAV) have provided critical real-time surveillance and operational support to military organizations, and are a key source of intelligence, particularly when integrated with other geospatial data. Intergraph®’s Motion Video Exploitation solution leverages motion video resources such as these, giving analysts the unprecedented ability to collect, extract, and maximize video assets. This breakthrough technology enables change detection, image enhancement, and integration with multiple geo-referenced sources to yield current, actionable intelligence in a highly dynamic intelligence landscape.

CONFIDENT ACTION BASED ON CLEAR INTELLIGENCE

For more than 40 years, Intergraph has been a trusted partner of defense and intelligence agencies around the globe. Continuing this tradition, our Motion Video Exploitation solution promotes a higher degree of confidence in strategic and tactical decisions. With our software, commanders can take decisive action based on a complete understanding of a video’s geospatial context. We give you an up-to-the-minute view of the operational situation on the ground through near-real-time data streaming, with automatic data ingest capabilities that collect geospatial information and video metadata to quickly pinpoint relevant changes.

Leveraging Intergraph’s long-standing expertise in integration, our solution fuses and displays video data with satellite imagery and geo-intelligence. We provide an end-to-end workflow – not a patchwork of disjointed applications – to enable
quick and orderly data collection, extraction, fusion, and analysis in the most complex and rapidly evolving situations.

**SUPERIOR MANAGEMENT OF GEOSPATIAL CONTENT**

A critical factor in video analysis is the ability to easily query through vast archives of imagery for specific clips that meet your search criteria, and to rapidly transfer those results to the exploitation environment. Criteria may include sensor type, date and time of collection, geospatial extents of video coverage, and keywords that describe objects or activities that occur within the video. Intergraph’s enterprise content management tools handle the broad range of video formats, along with other complex files such as satellite imagery and elevation models. The result is a scenario in which you can quickly zoom to a part of the world – possibly even down to a street corner – and instantly queue up segments from collected video from the last 10 days that pertains to that location. You can then fuse those results with satellite images and signals intelligence, and effectively plan your action, such as the routing of a convoy.

**Instant and Accurate Real-Time Enhancements**

In some cases, even with superior content management and powerful data integration and visualization tools, poor-quality video can hamper your analysis. For example, the original captured video may be of poor quality – or even unusable – due to flight path, altitude, buffeting of aircraft, and other factors. To mitigate this problem, Intergraph’s technology works in a modular fashion to perform real-time enhancements and corrections on the video, such as removing atmospheric distortion, correcting for shadows that affect brightness and contrast, and stabilizing jittery video. We give you state-of-the-art technology to perform these enhancements, increasing the usefulness of UAV video in a real-time and forensic capacity. By allowing you to set thresholds, tolerances, and other parameters, and perform tasks in batch mode or interactively, our solution helps you handle the ever-increasing volume of video that must be processed for analysis.

**Creating, Storing, and Retrieving Annotations**

Knowing when an event occurred is often as important as knowing where it occurred. Therefore, the ability to place annotations and clipmarks within a video stream and save them is essential to intelligence analysis. Using our solution, annotations are searchable by both geospatial and temporal location, which is key to strategic and tactical planning. For example, annotations can help you detect temporal patterns associated with specific events. The ability to access this information on an enterprisewide basis can be critical to the mission.

**Simplified 3D Visualization and Fly-Through**

To advance the mission, a software solution must simplify the user experience. Today’s analysts can easily become overwhelmed with the variety of applications on their desktops, so reducing the overall number of windows and interfaces goes a long way toward improving
efficiency and accuracy. To that end, Intergraph seamlessly integrates third-party 3D visualization and fly-through technology into our solution. This simulation capability incorporates georeferenced real-time video into the 3D environment, along with satellite imagery draped over terrain models, 3D models, and dynamic location of moving vehicles on the ground and in the air. This reduces the overall number of applications you need to visualize and analyze a wide variety of static and dynamic data sources.

COTS TECHNOLOGY, INDUSTRY STANDARDS
By helping defense and intelligence agencies fuse and exploit vast amounts of multi-source data, Intergraph’s fully integrated commercial off-the-shelf (COTS) solutions deliver unprecedented efficiency. Based on open industry standards, our COTS software promotes multi-agency interoperability and fusion of data from numerous disparate sources. We empower you to improve your analysis of motion imagery integrated with other geospatial intelligence, as well as manage and disseminate video data collections.

OUR MOTION VIDEO EXPLOITATION APPLICATIONS
Our applications can be combined to create an end-to-end Motion Video Exploitation solution, or used separately to support individual tasks and operational requirements.

Geospatial Content Management
Intergraph’s Geospatial Content Management facilitates ingest and management of video formats with accompanying KLV metadata. This application supports agencies that provide geospatial analysis and other services that require the collection, storage, and retrieval of video and video products for historical situational awareness and understanding.

Video Exploitation
Intergraph’s Video Exploitation is an Adobe-based viewer for use on ruggedized laptops, providing a complete end-to-end solution for the creation, management, and distribution of video products. This application supports the military, coalition forces, and agencies that need to exploit video products in support of the decision-making process in theater.

Motion Video Analysis
Intergraph’s Motion Video Analysis provides a high-productivity environment for analysis of motion video taken from UAVs and other moving vehicles. The military, coalition forces, and agencies that operate in theater can use this application to exploit and perform analysis on video for near real-time decision-making.

Motion Video Analysis Professional
Intergraph’s Motion Video Analysis Professional provides a seamless geospatial environment for the analysis of all types of geospatial intelligence at central command: raster maps, vector data, motion video, satellite imagery, and signal intelligence. This application is well-suited for agencies that conduct advanced analysis on all sources of intelligence data by allowing them to integrate/fuse motion video with them to generate a complete operational picture.
Multi-INT Exploitation

Intergraph’s Multi-INT Exploitation gives you an edge with a high-impact environment for the graphic analysis of motion video and related geographic data, such as raster maps, vector data, satellite imagery, terrain data, and 3D visualization. This application is ideal for agencies that conduct advanced analysis on motion video and imagery, and fuse it with other forms of geospatial intelligence to create a complete 3D intelligence product.

A SOLUTION FOR REAL-WORLD WORKFLOWS

Intergraph’s Motion Video Exploitation solution is easily applied to a wide range of situations in which video resources are needed to achieve a complete intelligence picture. Here is a sample workflow that addresses individual crew members’ responsibilities.

Exploiting Motion Video Imagery

Military intelligence image analysts use geospatial video taken from an extended range multipurpose (ERMP) unmanned vehicle, a multi-mission aircraft based on the UAV Predator. The goal is to create an intelligence product that military commanders can use to better understand the situation on the ground and aid in operational and strategic decision-making.

Primary Imagery Analyst

The primary imagery analyst’s task is to monitor ERMP video feeds to identify objects or events in the imagery, capture screenshots and clips that require further investigation, and transfer them to the next crew member – the production analyst. Intergraph’s Motion Video Analysis application provides a superior environment for the primary imagery analyst to exploit and perform analysis in theater for near real-time decision-making.

Production Analyst

The production analyst must investigate the screen captures collected by the primary image analyst. This team member must then retrieve information from multiple sources (governmental and non-governmental), manage electronic maps and data files, identify vehicle types on imagery, determine geospatial position data from imagery, calculate the dimensions of objects and identify manmade obstacles on imagery, and prepare imagery-derived products to enable the analysis of activities in support of various missions. Intergraph’s Motion Video Analysis Professional application gives the production analyst the capability to perform these advanced analysis tasks on motion video and imagery to create intelligence products for the production analyst 2, combat squad leader, and their command.

Production Analyst 2

The production analyst 2’s tasks are to write reports, develop presentations, and prepare other imagery products that might be required for submission to the commander. This crew member responds to specific intelligence data, prepares overlays, translates information into military symbols, manipulates computer files, and manages electronic maps and data files. Intergraph’s Multi-INT Exploitation application allows the analyst to conduct advanced analysis on all sources of intelligence data and integrate/fuse motion video with them to generate a complete operational picture for situational awareness.
Post Operation Analyst
The post operation analyst’s tasks are to review tactical operations from a 2D and 3D perspective, prepare 2D and 3D overlays, integrate other forms of operational intelligence, manage electronic maps and data files, develop presentations, write reports, prepare other imagery products that might be required for submission to the commander, and make strategic recommendations. Multi-INT Exploitation allows the analyst to perform advanced analysis on motion video and imagery and integrate/fuse motion video with 2D and 3D geospatial data and other forms of intelligence data to provide a comprehensive intelligence product.

Combat Squad Leader
The combat squad leader supervises the first four team members and reviews all products before they are delivered to command staff. The combat squad leader also coordinates Multi-INT information and all-source intelligence support and presents results in required briefings or meetings. The combat squad leader reviews video clips received from analysts, reviews the video generated from local ground sources, and enhances and stabilizes the video clips as needed in support of the mission. With the full suite of Motion Video Exploitation applications, including Geospatial Content Management and Video Exploitation, the combat squad leader can query, retrieve, fuse, and manage the imagery taken from the ERMP with the data and imagery held in the enterprise database to create a complete intelligence picture.
ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph’s industry-specific software to organize vast amounts of data into understandable visual representations and actionable intelligence. Intergraph’s software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, and operation of plants, ships, and offshore facilities. Intergraph SG&I provides geospatially powered solutions to the defense and intelligence, public safety and security, government, transportation, photogrammetry, utilities, and communications industries.

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