com sur™

the missing piece of CCTV

COM-SUR™ EMPOWERS PEOPLE TO ACHIEVE OPTIMAL OUTCOMES FROM SURVEILLANCE VIDEO, LEADING TO A SAFER WORLD.

COM-SUR™ – THE MS OFFICE OF CCTV/VIDEO SURVEILLANCE

The purpose of this document is to demonstrate the utility value of COM-SUR as a supportive and productivity tool that complements a Video Management System (VMS), Video Analytics, Artificial Intelligence, and Machine Learning technologies.

Just as MS Office enhances the productivity and standardizes the interaction of a user when it comes to creating documents, presentations, spreadsheets, and communications, similarly, COM-SUR acts as an underlying tool that enhances the productivity and standardizes the interaction of a user when it comes to working with surveillance video and images irrespective of the type of cameras and other video surveillance technologies.

VIDEO MANAGEMENT SYSTEMS (VMS)	COM-SUR
OBJECTIVES	
A Video Management System (whether basic or full-fledged) is a component of any CCTV camera infrastructure (a VMS is restricted generally only to CCTV cameras). Full-fledged VMSs are used at locations where large number of cameras are deployed or in cases where users need advanced features. A VMS enables users to: • Add and manage cameras to view live/recorded video. • Record/store the video in a storage device. • Search/Access/Extract recorded video as and when required. The following items remain excluded from the scope of a VMS: • Data size reduction and creation of a cost-effective disaster recovery mechanism. • The angle of auditing the footage as an SOP /continuous investigation and offering various forensics tools to do so. • The creation of well-categorized institutional libraries of important footage along with other information that can be used to train AI/ML models.	COM-SUR is a tool that empowers every user of all kinds of surveillance cameras (CCTV, Drones, UAVs, Body-worn, Mobile phones, etc.), to achieve optimal outcomes from video in multiple areas. The need for COM-SUR therefore is broader both in terms of the type of video source as well as the type of users. i.e., from a home user with a single camera to commercial users with hundreds/thousands of cameras. COM-SUR sits as a stack/layer over live/recorded video feed from any source and enables users to: • Automatically convert video feed into images at every one second, i.e., COM-SUR captures the 'moment' when multiple frames (I, P, B frames) come together in 'that' one second. Doing so reduces the data size dramatically (TB to GB) without missing any noticeably important information. Images created by COM-SUR become data sets to train AI and ML models with more site-specific images rather than generic images, thereby delivering better results and reducing bias. • 'Audit' hours of video footage displaying multiple cameras in minutes without missing a single 'frame'. This enables the user to grasp the entire perspective as opposed to viewing only bits and pieces of footage that are decided by rule-based methods, which could well miss out critical clues/other important information.

• The creation of various standardized intelligent incident reports that deliver data analytics/B.I.	• Backup video data in the form of images at multiple remote locations for the purpose of disaster recovery. These images can be re-converted into video automatically or on demand. • Create standardized intelligent reports in PowerPoint, Word, PDF, and Excel. COM-SUR's reports deliver data analytics/B.I.

FEATURES

A VMS generally offers features to:	COM-SUR offers features to:
• View live/recorded video feeds from multiple cameras from a single/several locations. • Playback recorded video from single/multiple cameras at various pre-set speeds (2X, 4X, 8X, etc.). • Record video with multiple options like, continuously, scheduled, or trigger based (motion, alarms, etc.). • Determine the quality of recording by selecting the video format (e.g., H.264, H.265, etc.), resolution, frame rate, bit rate, keyframe interval etc. • Search by specifying the desired date, time, camera, etc. Some VMS also offer forensic search. • Zoom into a video. However, zooming generally happens ONLY over a SINGLE camera at a time.	• View live/recorded video feeds from multiple cameras from a single/several locations. At the same time, COM-SUR automatically converts the feeds into images. • Playback the images using six exceptional playback mechanisms. COM-SUR's playback mechanisms are very efficient and come with multiple features that make minute investigations more timesaving and proficient. COM-SUR makes it very easy to playback thousands of images depicting multiple cameras over the internet, which is a great benefit, since the playback of multiple video feeds over the internet is very cumbersome due to the sheer size of video. • Playback multiple pre-recorded videos next to each other in a dashboard view, and also time/frame syncing them. This is a huge burden solved during any investigation when videos are collected from multiple sources, for example, from a scene of crime.

- Export video, generally of a single camera at a time.

- Monitor the health and up-time of the cameras and the feeds against intentional/accidental covering, camera offline, camera out of focus, camera moved, etc.

- Record an entire day's video from multiple cameras as opposed to only rule-based recording, thereby eliminating the risk of missing out on important moments. The 'way' COM-SUR records video feeds from multiple cameras reduces the data size dramatically and creates a cost-effective disaster recovery backup at multiple locations (including the user's own cloud), without consuming any additional bandwidth.

- Search for images depicting multiple cameras over a date and time range as well as for a particular time slot over a desired date range.

- Zoom into any area of MULTIPLE cameras at the same time. This makes it easier to join the dots, i.e., the user can compare scenes between different cameras.

- Flag exceptions and items of interest.

- Tag relevant images to create an institutional library of important findings.

- Annotate items for the purpose of machine learning.

- Enhance the quality of the images in terms of the brightness and contrast, along with the ability to add various forensics filters (false colors) to the images for better discovery and isolation.

- Create standardized audit finding /incident/other reports in PowerPoint, PDF, Word, and Excel.

	• Create a single video file displaying multiple cameras. This is a huge benefit when multiple videos have to be shared that depict a single incident/story.
	• Gain business intelligence (patterns and trends) based on the historical data from the audit findings /incident reports.

VIDEO ANALYTICS, ARTIFICAL INTELLIGENCE AND MACHINE LEARNING TECHNOLOGIES	COM-SUR

Video Analytics

Video analytics is a technology that processes the video feed from a camera using a specialised algorithm in order to perform a specific security related function such as motion detection, face recognition, license plate detection/recognition, object detection, object removal, boundary loitering detection, zone/perimeter intrusion, people counting, etc.

Artificial Intelligence

Basically, there are two types of video analytics. The first type uses specific algorithms in order to detect specific behaviours in the video, while the second type does not use any algorithms at all. Instead, it uses Artificial Intelligence (AI) to 'learn' normal/accepted behaviour and raises exceptions when deviations from the normal/accepted behaviour are observed in the video.

Machine Learning

Machine Learning (ML) is a subset of Artificial Intelligence (AI) which enables a computer system to make predictions or take some decisions using historical data without the need for explicit programming. Machine learning uses a humungous amount of structured and semi-structured data in order to generate accurate results or make predictions based on that data. Machine Learning algorithms are deployed for specific domains. A machine learning model devised to detect images of cars will only give results for car images. In case the model is provided with images of bicycles, it may become unresponsive.

As is evident, Video Analytics, Artificial Intelligence, and Machine Learning technologies can deliver only those results, or detect only those exceptions for which they have been programmed for.

What about the rest?

Here are a few points as to why COM-SUR is still needed as a supportive and complementary tool to these technologies:

1. When results/alerts are received, besides false positives, a human operator is always needed to verify them and to take next steps like reporting, cataloguing etc. COM-SUR will help the operator to perform these tasks very efficiently.

2. As explained above, none of these technologies will absolutely be able to detect strange/suspicious behaviour, recces before committing a serious crime, a child being taken to some corner at school where he/she is not supposed to be, violation of processes, health and safety issues, someone smoking in a no-smoking area, filthy kitchens, spitting, and so on. The list of such exceptions can be endless. COM-SUR will help the operator/user to discover the unknown and the unexpected.

3. As explained above, COM-SUR is an affordable tool for every user. Automated technologies can only be deployed where budgets are not a constraint.

In conclusion: COM-SUR is like a kernel occupying the center-stage to ensure that every user is able to convert surveillance video into actionable insights, in short, helping users to convert garbage into gold!