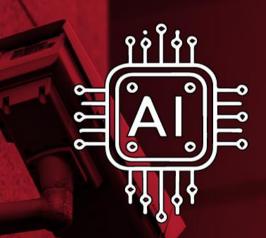# com sur ™

the missing piece of CCTV

"SEE WHAT THE CAMERA SAW"

THE FOOTAGE WHISPERER

AI

'BETTER' AI VIA DAILY AUDITS
NO MORE DATA WALL

100+ TOPICS - AIRPORTS TO ZOOS

GAUTAM D. GORADIA

COM-SUR
the missing piece of CCTV

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE.

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE

WELCOME

PREAMBLE

In the realm of surveillance systems, the importance of auditing cannot be overstated. Just as we review photos after taking them on our phones, CCTV footage needs to be audited to ensure that no information is missed, and that the user can "SEE WHAT THE CAMERA SAW" to understand the entire perspective without missing a 'single frame'.

This note explores the critical need for daily auditing, the limitations of traditional DVR/NVR/VMS/Cloud storage systems, and how 'COM-SUR', a unique CCTV video footage auditing software, addresses these challenges.

EMPIRICAL EVIDENCE OF OPTIMAL OUTCOMES

Surveillance cameras, ranging from CCTV to drones, UAVs, body-worn, and dashcam cameras, have seen a significant increase in deployment. However, there is a lack of empirical evidence showcasing that users are achieving optimal outcomes from these cameras. Despite their widespread use, the effectiveness of surveillance systems in areas beyond crime prevention, such as risk mitigation, operational efficiency, business continuity, health and safety, compliance monitoring, etc., remains largely unproven. The deluge of video data generated by these cameras often leads to wasted or underutilized footage, highlighting the need for a solution that can quickly and effectively extract meaningful insights from the vast amounts of visual information.

MEGAPIXEL CRAZE AND OVERWRITTEN FOOTAGE

The relentless pursuit of higher megapixels in surveillance cameras has inadvertently increased storage requirements without addressing the fundamental issue of efficiently accessing relevant footage. As video data accumulates, older footage gets overwritten, leading to challenges in reverting to pertinent recordings after a certain period. This limitation underscores the necessity for a solution that can intelligently manage and retrieve critical footage while minimizing storage overheads.

COM-SUR™
the missing piece of CCTV

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE.

IMPORTANCE OF DAILY AUDITING

Daily auditing of CCTV footage is crucial for several reasons:

- Complete Context: Auditing provides the complete context of what the camera saw, ensuring that no detail is missed. This is particularly important in scenarios where one does not know 'which frame' will provide crucial information.

- Detecting Anomalies: Regular auditing can help detect anomalies or incidents that might not trigger motion detection or other automated alerts. This will result in cost savings, lesser errors, waste reduction, improve sustainability practices, minimize downtimes, delays, and help identify areas for improvement. It will also help make more informed decisions based on hard visual facts.

- Ensuring Operational Efficiency, Business Continuity, Risk Mitigation, Compliance, Health and Safety, etc.: Regular auditing can help identify gaps helping businesses to take quicker corrective and preventive action, leading to continuous improvement (Kaizen).

- Legal Compliance: In some industries, regular auditing of CCTV footage is a legal requirement for compliance purposes.

NEW SKILL - CCTV VIDEO FOOTAGE AUDITORS

It is apt to add here that the above new skill has been recognized by the Ministry of Skill Development and the Education Ministry in India, CCTV Video Footage Auditors will play a crucial role in ensuring the effective utilization of surveillance video. Their skills in daily auditing and continuous forensics will contribute to achieving the benefits as outlined in this note.

For more information, visit:
https://www.comsur.biz/new-skill.html

LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS

Despite the increase in the number of cameras and advancements in technology, traditional DVR/NVR/VMS/Cloud storage systems often fall short in delivering optimal outcomes due to several reasons:

- Time-Consuming Playback: Real-time playback of 24 hours of footage is time-consuming and impractical. Video data is typically stored in a compressed format to save storage space. This involves encoding the video data when it is recorded. The encoding process transforms the video data into a format that is more efficient to store. When you playback the video, the compressed data needs to be transformed back into a format that can be displayed on your screen. This process is called decoding. The decoding happens in real-time as you're watching the video. In the context of a DVR, NVR, or VMS/Cloud storage system, when you select a video for playback, the system reads the compressed video data from the storage device and decodes it in real-time to display the video on your screen.

- Network Issues: Remote access and playback can be bandwidth-intensive, especially for high-resolution videos, and more so when multiple cameras are being played back. Decoding multiple video streams in real-time requires substantial CPU and GPU (in some cases) resources. The more cameras you have, the more processing power you'll need.

- Data Size and Bandwidth: High-resolution videos from multiple cameras result in large data sizes, posing challenges for storage and

COM-SUR
the missing piece of CCTV

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE.

network bandwidth. DVRs, NVRs, and VMS/Cloud storage systems need to read the recorded video data from storage devices. If multiple high-resolution video streams are being accessed simultaneously, it can put a strain on the storage subsystem. Also, high-speed playback of high-resolution video requires a lot of bandwidth. If the network connection is not fast enough, the video playback can be choppy or delayed.

- Latency and Data Cap: There can be a delay (latency) between the server (where the video is stored) and the client (where the video is being viewed). This latency can affect the smoothness of the video playback. Some internet service providers impose data caps, which can limit the amount of video that can be viewed.

- Cost and Complexity: Automated technologies that aim to address these issues come with high costs, increased complexity and become unaffordable when there are hundreds/thousands of cameras.

- Restricted to CCTV cameras only: These technologies are generally restricted to CCTV cameras only. They are not designed to work with other sources of surveillance video cameras like Drones, UAVs, Body-Worn, Dashcams etc.

- Very limited investigative capabilities: The above technologies offer no features to enhance the quality of video, forensics filters, and lag when videos from multiple sources are used during an investigation. For example, they cannot work with recorded video and images that are gathered from a scene of crime and offer no capabilities of frame matching which would be a great asset to help join the dots.

To mitigate some of the above issues, systems often offer features like Fast Forward, Skip, Silence/No-Motion, Event Search, Thumbnail Search, and so on. However, while these features can help, reviewing surveillance footage can still be a very time-consuming and frustrating task, especially when one is trying to carry out RVA (remote video auditing).

"ALL THAT GLITTERS IS NOT GOLD". AI IN SURVEILLANCE: CUTTING THROUGH THE HYPE AND UNVEILING THE REALITY

In the realm of video surveillance, there's a cacophony of buzzwords being bandied about by camera manufacturers and Video Management System (VMS) providers. "AI-powered", "Edge computing", "Deep learning" - these terms are often used as shiny baubles to dazzle potential customers. But it's crucial to cut through the hype and understand the reality.

1. Limited Scope: AI systems are not omniscient. They can only perform tasks they've been explicitly programmed for. They falter when faced with unexpected or unknown situations. The world of surveillance is dynamic and unpredictable, and AI will not always be up to the task.

2. False Positives: AI systems are notorious for generating false positives. In the context of surveillance, this could lead to unnecessary alerts, wasted resources, and potentially missed threats.

3. Continuous Training: AI systems require continuous training to improve their accuracy and adapt to new situations. This necessitates a significant investment of time and resources, which is often glossed over in the sales pitch.

4. Processing Power and Expense: The promise of edge computing - processing data on the device itself - is often touted as a solution to

COM-SUR™ the missing piece of CCTV

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE.

bandwidth and latency issues. However, the reality is that managing high-resolution feeds from hundreds or thousands of cameras requires significant processing power and storage capacity, leading to substantial hardware and software costs.

5. Specificity of AI Applications: AI's success in one domain doesn't guarantee its effectiveness in another. Each application of AI requires specific training and tuning. Just because AI excels in natural language processing or image recognition doesn't mean it will perform equally well in video surveillance.

6. Human Oversight: AI is a tool, not a replacement for human judgment. Even when AI systems provide suggestions or insights, human oversight is always necessary to make final decisions. For instance, a doctor would review an AI's suggestion of a malignancy before starting treatment.

In conclusion, while AI can be a powerful tool in video surveillance, it's not a panacea. It's important to have realistic expectations about its capabilities and limitations. It's crucial therefore to look beyond the shiny exterior of AI hype and understand the reality underneath.

ENTER COM-SUR™

COM-SUR addresses these challenges in innovative ways:

- Efficient Auditing: COM-SUR converts live (or recorded) video feeds from multiple cameras into raster images at every second, capturing the critical moment when the Intra (I), Predicted (P), and Bidirectional (B) frames converge. This means that COM-SUR captures the 'finished product' of that ONE SECOND when the frames converge. This reduces the 'volume' (maximum of 86400 images representing 24 hours) of the data to be

reviewed, and in conjunction with COM-SUR's smart media player, users can audit hours of surveillance footage in minutes. Additionally, because the 'moment' or the finished product is being converted to images, there is minimal loss of information.

- Smooth as silk: Since COM-SUR eliminates the need for encoding/decoding, the playback of the images is literally as smooth as silk. On a serious note, when one is investigating, this smoothness and the ability to go back and forth with efficiency becomes very essential (including zooming/panning into multiple cameras), something that is generally found as impossible or very sluggish and cumbersome when working with a DVR/NVR/VMS/Storage system because, there is resource-consuming processing involved before the videos are displayed to the user.

- Data Size Reduction: By capturing all the cameras in a single frame, COM-SUR significantly reduces the data size, alleviating storage and network load.

- 'Relevant' Data Sets for AI Models: Images created by COM-SUR are 'site-specific'. They can be used to train AI models which will deliver better accuracy and lesser bias because the model is trained on site-specific and continuous flow of new images.

- Remote Video Auditing (RVA): COM-SUR allows for efficient RVA by having the auditor remotely access the PC running COM-SUR, significantly reducing the load on the network.

- Backup and Disaster Recovery: COM-SUR provides a smart backup feature and allows users to sync the data to cloud storage services like Dropbox, Google Drive, or OneDrive, ensuring that the data is always

COM-SUR
the missing piece of CCTV

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE.

available.

- Camera type agnostic: COM-SUR works with all types of cameras; CCTV, Drones, Body-Worn, Dashcams, and even videos shot using Mobile Phones. It offers exceptional investigative features including forensics filters, frame matching, exceptional Pan and Zoom, and also one-click reporting in PowerPoint, Word, etc.

- Institutional Library: COM-SUR's ability to create an institutional library of important findings ensures that any data that is useful can be searched at the click of a button.

- Community Policing and Visual Dragnet: Once people (both home and commercial users) audit their own video footage daily, it will lead to the discovery and prevention of several threats. COM-SUR's free HOME version will help both home users and housing complexes to remain safer. This kind of community policing and crowd-sourced surveillance with standardized CCTV signage that delivers a powerful new message "For everyone's safety, we audit CCTV footage everyday" will save governments significant amounts of funds. The police on the other hand will get quick access to analyse large amounts of visual data from multiple sources to identify potential suspects and criminal activity. The combination of community policing and visual dragnet will help prevent crime and ensure a secure environment for all members of society.

"OH, BUT AUDITING IS SO MANUAL"

People often feel that 'auditing' is manual, and that there is no intelligence in it. But aren't most things in life manual? And isn't human intelligence finally needed to make real judgment, even with all the AI, ML, and such automated technologies? Isn't playback of a

DVR/NVR/VMS/Cloud storage system also manual? Here are a few more examples related to visual information in daily life, all of which are manual:

1. Browsing Social Media: Scrolling through a social media feed is a manual process. Each post or photo must be individually viewed and processed.

2. Watching Videos: Whether it's on a streaming platform or social media, we manually select each video to watch. Even with autoplay, we still make the decision to continue watching or skip to the next video.

3. Reading News or Articles Online: We manually scroll through the text, read it, and process the information. We also decide when to move on to the next article.

4. Navigating Maps: When using digital maps, we manually zoom in and out and move the map around to view different areas.

5. Online Shopping: Browsing products in an online store is a manual process. We look at each product photo, read the descriptions, and make decisions based on this information.

In all these examples, just like with CCTV footage playback, there's a manual element involved in processing visual information. But what if the manual process is itself so efficient and easy?

"JUST SHOW ME WHAT'S IMPORTANT"

Another thing that people say, "oh but why should I see 24 hours of footage"? Just show me the important stuff. To which, the answer is "in order to understand the perspective of a movie or the entire story, one has to see the entire movie. The director shoots thousands of hours, then edits the footage, and gives you a short capsule. To

COM-SUR
the missing piece of CCTV

THE LIMITATIONS OF DVR/NVR/VMS/CLOUD STORAGE SYSTEMS TO OFFER THE 'GRACE AND ELEGANCE' TO 'AUDIT' SURVEILLANCE FOOTAGE.

understand the perspective, you have to see the entire film, not just the scene when the mystery unravelled". So, while it's possible to focus on key events or anomalies, the context provided by the full footage can often be crucial in understanding the bigger picture. This perspective can be especially important in situations where security, safety, or compliance are concerned. Finally, one must remember that any automated system can only show you what it has been programmed for. For example, 1,2,3. What about 4,5,6,7 etc? What about the unknown and the unexpected? Why depend on an algorithm to decide what you need to see? And in any case, whether the results are true or false positives, it will always be YOU, the human to see it. Therefore, why not then see the entire picture now that you have the tool? While algorithms can help filter and highlight potentially important events, they might miss out on subtle details or context that a human observer could pick up. Moreover, the final decision often rests with a human, who needs to verify and act upon the information provided by the system. With a tool like COM-SUR, users can review the entire picture without missing a 'single frame. This can provide a more comprehensive understanding of the situation and allow for better decision-making. It's about leveraging the strengths of both humans and technology to achieve the best results, which may be referred to as Augmented Intelligence (AI).

CONCLUSION - COM-SUR™ - THE FUTURE OF CCTV TECHNOLOGY - AVAILABLE TODAY!

In the realm of video surveillance, the need for daily auditing of CCTV footage is not just important, it's indispensable. Traditional DVR/NVR/VMS/Cloud storage systems, while necessary, will fall short when it comes to efficient auditing of 24 hours of footage. This is where COM-SUR steps in, not as a mere tool or kernel, but as an indispensable cornerstone of your surveillance system.

COM-SUR, with its innovative approach, provides a comprehensive solution for CCTV footage auditing. It enables efficient auditing, smart backup, and standardized reporting, transforming CCTV from a reactive security tool into a proactive, intelligence-gathering system. It's not just a game-changer, it's a paradigm shift for anyone who needs to manage and analyse large amounts of CCTV footage. On a lighter note, you can jump up and down, pull your hair, or explore every other option out there, but the fact remains - without COM-SUR, your video surveillance efforts are incomplete. Imagine you're at a buffet. You try every dish, savour every flavour, but then you discover the dessert section - that's COM-SUR. No matter how much you've enjoyed the rest, your video surveillance efforts are like a meal without dessert until you add COM-SUR. It's the sweet finish that completes the experience. The future of CCTV/surveillance footage auditing is not just here, it's been redefined, and it's spelt 'COM-SUR!'

COM-SUR – THE MISSING PIECE OF CCTV - ITS COMPARISON WITH A VMS, VIDEO ANALYTICS, AI/ML

It is recommended that you also read the above document to make an easy comparison. To download the same, click here:
https://comsur.biz/COM-SUR_-_Comparison_with_a_VMS_VA_AI_ML_-_Template_no._13.1a.pdf

In closing, we present three guiding principles that will revolutionize video surveillance:

1. Auditing is fundamental—everything else is peripheral.

2. Cameras have lenses—humans have eyes.

3. Let's make cameras 'accountable.'