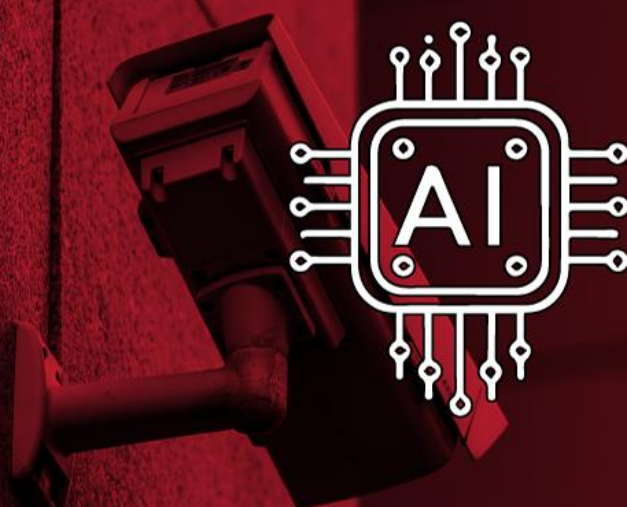com
sur™
the missing piece of CCTV

"SEE WHAT THE CAMERA SAW"

THE FOOTAGE WHISPERER

'BETTER' AI VIA DAILY AUDITS
NO MORE DATA WALL

100+ TOPICS - AIRPORTS TO ZOOS

GAUTAM D. GORADIA

UTILITY VALUE OF COM-SUR™ FOR SEA EXPLORATION FACILITIES

WELCOME

AUDIT HOURS OF FOOTAGE IN MINUTES
FIND OUT HOW COM-SUR, THE BEST 'MOUSETRAP' WILL HELP

"Seeing is believing - See what the camera saw"

CCTV and other forms of video surveillance are common in sea exploration facilities world over, but footage is often only reviewed reactively. Our company realized this problem early-on and has developed the world's only CCTV video footage auditing software that encourages daily auditing (hours in minutes) of CCTV footage, filling the gap for a complete "workflow". The software works with existing cameras and VMS, regardless of type/brand, and provides a standardized approach for intelligent incident reporting. Our software also offers exceptional investigative capabilities.

'COM-SUR' – THE WORLD'S ONLY CCTV/OTHER SURVEILLANCE VIDEO FOOTAGE AUDITING, SMART BACKUP, AND STANDARDIZED INTELLIGENT INCIDENT REPORTING SOFTWARE – THE MISSING PIECE OF CCTV/OTHER SURVEILLANCE VIDEO

COM-SUR is the world's only CCTV/other surveillance video footage auditing, smart backup, and standardized intelligent incident reporting software that serves as a complete workflow and force multiplier. It helps audit 24 hours of footage in minutes, reduces data size, creates standardized intelligent reports, and delivers business intelligence. COM-SUR helps unlock hidden information in CCTV/other surveillance video footage and enables people to gain actionable intelligence, improve homeland security, prevent crime and losses, identify and mitigate threats and hazards, and improve operational efficiency. It empowers people to gain new jobs as CCTV/other surveillance video footage auditors and start new businesses of auditing video footage. Like MS Office, COM-SUR is an enabler that makes it easy to work with CCTV and other surveillance cameras in a standardized way, leading to better decision-making. It also offers exceptional investigative capabilities.

BETTER AI VIA DAILY AUDITS – NO MORE DATA WALL

COM-SUR delivers 'BETTER' AI by transforming how organizations approach CCTV video

surveillance, auditing, and post-event analysis. By generating a constant stream of real-time, site-specific data—Continuous Frontier Data—COM-SUR ensures that AI systems are never starved for fresh, actionable insights, which is key for building custom models and addressing key challenges like data exhaustion, data walls, and data cascades that often hinder AI from performing at full potential.

A key to making AI more effective lies in continuous learning from real-world incidents through daily and post-event auditing. COM-SUR enables AI models to evolve based on audit findings and incidents that go beyond real-time detection. By auditing daily footage, capturing exceptions, and feeding this data back into AI models, COM-SUR significantly improves the accuracy of AI systems, helping to reduce false alarms and enhance detection capabilities. This continuous feedback loop ensures that AI learns from what might have been missed in real-time, making it smarter and more reliable over time.

By integrating Reinforcement Learning from Human Feedback (RLHF) and Explainable AI (XAI), COM-SUR ensures that AI systems are continuously refined, transparent, responsible, and contextually aware. However, recognizing that AI can only perform tasks it's programmed for, human intelligence and intervention remain essential in verifying and refining AI outcomes. With COM-SUR, businesses can leverage AI as a powerful tool while maintaining human oversight, ensuring more accurate and informed decision-making—ultimately leading to 'BETTER' AI. This not only enhances surveillance but also paves the way for Augmented Intelligence, where AI-driven insights empower human operators while keeping them at the center of decision-making.

HOW COM-SUR SMARTLY REDUCES 'VIDEO' STORAGE SIZE

COM-SUR employs an innovative approach to smartly reduce the amount of video to be audited and consequently the storage size of videos. Regardless of the video's frame rate, COM-SUR captures a single screenshot of the consolidated 'moment' of 'that' one second, when the I, P, and B frames come together. This method significantly reduces data size without sacrificing vital information. It goes without saying that when multiple cameras are displayed in a grid view, say 4x4, the storage size is further reduced since all the cameras are captured as a single image. Since no suggestion is being made to replace the actual video with screenshots, COM-SUR acts as a wonderful supportive technology both to audit (review) just 86400 frames representing 24 hours and reducing the data size at the same time.

CHALLENGES FACED BY SEA EXPLORATION FACILITIES

1. Unauthorized access:

Sea exploration facilities are highly restricted areas with limited access. Controlling and monitoring access to these facilities is crucial to prevent unauthorized individuals from entering sensitive areas and to protect valuable assets.

2. Sabotage and vandalism:

The potential for intentional damage to equipment, vehicles, or infrastructure is a security concern. Sabotage or vandalism could compromise the success of sea missions and result in financial losses.

3. Threats from marine life:

Sea exploration facilities often encounter threats from marine life, including biofouling

(the process of marine life, such as barnacles, algae, and other organisms attaching to the hulls of research vessels and other submerged structures) affecting performance, accidental collisions or damage to equipment by larger organisms, interference with scientific instruments deployed in the water, and potential impacts on underwater infrastructure. Artificial lights and noise from facilities attract marine organisms, potentially disrupting research activities, and researchers need to be mindful of the sensitivity of marine ecosystems during experimentation.

4. Piracy and maritime security:

Sea exploration vessels may encounter the threat of piracy, especially in regions with a history of maritime security issues. This poses a risk to the safety of crew members and the security of valuable equipment.

5. Environmental hazards:

Sea exploration facilities are susceptible to environmental hazards such as storms, hurricanes, and rough sea conditions. These can jeopardize the safety of vessels and equipment, requiring careful navigation and preparedness.

6. Remote and harsh environments:

Many sea exploration facilities operate in remote and challenging environments, such as the open ocean or polar regions. The isolation and harsh conditions can make emergency response and evacuation more difficult.

7. Data security:

Sea exploration facilities generate valuable scientific data, and ensuring the security of this information is crucial. Measures must be in place to protect data from theft, cyberattacks, or unauthorized access.

8. Occupational safety and health issues:

Sea exploration facilities need to monitor the safety and health of workers within their premises, ensuring that they are following proper safety protocols and identifying potential hazards that may need to be addressed.

9. Compliance issues:

Sea exploration facilities must comply with various regulations and standards related to environmental monitoring.

10. Insider threats:

Sea exploration facilities have to deal with insider threats from disgruntled employees or even unwitting staff who fail to follow proper security and safety measures.

11. Humongous growth of surveillance video:

The exponential growth of surveillance cameras has resulted in an unprecedented surge in surveillance video. Effectively managing this data has become a daunting challenge due to the massive storage capacity required, especially considering the prolonged retention periods necessary for security, incident investigation, or legal purposes. Furthermore, the prevalence of high-resolution video with increasing megapixels compounds the storage demands, making efficient data management an urgent priority for organizations grappling with the immense volume of surveillance footage.

USE OF VIDEO SURVEILLANCE AT SEA EXPLORATION FACILITIES

Most sea exploration facilities have video surveillance covering the following areas:

- Entry and exit points

- Bridge and navigation areas of research vessels

- Research and laboratory spaces

- Equipment deployment and retrieval areas

- Crew quarters

- Storage areas

- Engine rooms

- Perimeter and exterior spaces

Further, the concerned officials of sea exploration facilities generally need to review and analyse recorded CCTV video footage from time to time for investigating incidents and/or accidents, staff negligence etc., in order to corroborate evidence, as well as assisting Police/other Law Enforcement Agencies.

USE OF OTHER FORMS OF VIDEO SURVEILLANCE BY SEA EXPLORATION FACILITIES

Besides CCTV, sea exploration facilities deploy various other forms of video surveillance technologies to enhance monitoring and security as follows:

1. Underwater cameras:

Underwater cameras, whether mounted on remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), or fixed underwater platforms, provide visual data of the seafloor, marine life, and underwater features during exploration and research activities.

2. Thermal cameras:

Thermal cameras detect heat signatures, allowing for surveillance in complete darkness or adverse weather conditions. They are valuable for identifying potential issues with equipment or detecting anomalies in temperature.

3. Drones:

Drones equipped with cameras provide aerial surveillance of research vessels, equipment deployment, and surrounding maritime areas. Drones offer flexibility in capturing dynamic footage from different perspectives.

4. Body-worn cameras:

Personnel involved in research and exploration activities may use body-worn cameras to capture point-of-view footage. These cameras can provide additional perspectives and documentation of tasks performed by researchers.

5. Satellite-based surveillance:

Satellite imagery and surveillance may be used to monitor large-scale oceanographic phenomena, track vessel movements, or observe changes in the marine environment from space.

USE OF CAMERAS FOR SEA EXPLORATION

Cameras play a crucial role in sea exploration, providing researchers with visual data that enhances their understanding of the underwater environment and supports various scientific objectives. Here are several ways in which cameras are used for the purpose of sea exploration:

1. Underwater exploration:

Cameras, often mounted on remotely operated vehicles (ROVs) or autonomous underwater vehicles (AUVs), capture high-resolution images and videos of the seafloor, underwater ecosystems, and geological features. This visual data helps researchers study marine biodiversity, map underwater terrain, and identify potential sites for further investigation.

2. Documenting geological features:

High-definition cameras are used to document and analyze geological features such as underwater volcanic activity, hydrothermal vent systems, and underwater geysers.
This visual data aids in understanding geological processes and formations on the ocean floor.

3. Sample collection guidance:

Cameras are used to guide the collection of samples during underwater research missions. By providing visual feedback, researchers can assess the composition of seafloor sediments, rocks, or biological specimens before deciding on sample collection.

4. Monitoring oceanographic phenomena:

Cameras are utilized to monitor oceanographic phenomena, including currents, temperature gradients, and changes in water clarity.
This visual data helps researchers study the dynamics of the marine environment and its impact on ecosystems.

5. Climate change impact:

Cameras on research vessels and underwater platforms monitor and document the impact of climate change on marine ecosystems.

6. Search and rescue operations:

Cameras on search and rescue vessels, drones, and aircraft aid in the search for missing persons, assessing emergency situations, and providing real-time visuals to coordinate rescue efforts.

7. Military and defense applications:

Cameras on naval vessels, submarines, and drones provide situational awareness, monitor maritime borders, and supporting defense operations, including reconnaissance and threat detection.

8. Oil and gas industry monitoring:

Cameras on offshore platforms, underwater installations, and drones monitor and inspect underwater oil and gas infrastructure ensuring the safety and efficiency of operations.

9. Investigating shipwrecks and submerged structures:

Underwater cameras are employed to document and explore shipwrecks, submerged archaeological sites, and underwater structures. This visual documentation assists in historical research and the preservation of cultural heritage.

10. Fisheries management:

Cameras on fishing vessels, buoys, and underwater structures monitor fishing activities, and fish behavior in order to help implement strategies for sustainable fisheries management.

11. Recording ROV and AUV operations:

Cameras are integrated into ROVs and AUVs to record the operation of these vehicles during

underwater missions. This footage can be valuable for post-mission analysis, training, and documentation of exploration activities.

12. Monitoring instrument deployments:

Cameras are used to visually monitor the deployment and retrieval of scientific instruments, sensors, and equipment. This helps ensure the proper functioning of instruments and assess the success of data collection activities.

13. Real-time observation for researchers:

Live streaming cameras on underwater vehicles enable researchers to observe and direct exploration activities in real time.
This immediate visual feedback enhances decision-making during exploration missions.

14. Educational outreach:

Cameras are employed to capture engaging visuals for educational outreach purposes. Live streaming or recorded footage from sea exploration missions can be shared with the public, students, and educators to promote understanding and interest in marine science.

LIVE MONITORING – CHALLENGES

Several sea exploration facilities have a dedicated control room with operators, set up for live monitoring of CCTV and other cameras. However, live monitoring comes with its own set of challenges of video blindness, poor attention span, boredom, operator bias, false alerts, and so on.

Moreover, these cameras continuously capture and record humungous amounts of video data. It therefore becomes a daunting task for the operators to review and analyse this data

whenever the need arises. Thus, it may be noted that benefits from video surveillance systems can accrue only when they are used optimally, suggestions for which are enumerated further on, in this document.

COMPLIANCE - GENERAL

Conformity or compliance in any organization means adherence to laws and/or rules and regulations, various standards, as well as data storage and security requirements as laid down by government bodies, governing bodies of the respective industry, or the management of the organization. When an organization complies with the requirements mandated by government and/or governing bodies, then it is termed as 'regulatory compliance' which enables the organization to run in a legal and safe manner.

COMPLIANCE - AUDITS

Several organizations carry out compliance audits on a regular basis to avoid the potential consequences of non-compliance. A compliance audit examines how well an organization adheres to compliance requirements.
Some organizations use video surveillance to monitor compliance issues and audit recorded video footage from time to time for investigating and preventing compliance issues. Auditing video provides actionable insights on the level of compliance within the organization.

"CCTV AND OTHER FORMS OF VIDEO SURVEILLANCE ARE NOT ENOUGH – WE MAKE IT WORK FOR YOU"

While it is not being suggested that optimal usage of video surveillance can cure all issues, several issues of the following kind can be

addressed by doing just a little 'more' with respect to making the optimal use of video surveillance systems:

- Intrusions, especially by marine life

- Vandalism

- Tampering of equipment

- Recces/suspicious movements/activities

- Staff negligence

- Insider job/security lapses

- Accidents/Causes of potential accidents

- Unauthorized/unlawful activities/visitors

- Inattentive staff (e.g. guard sleeping)

- Fraud/loss/corruption/theft

- Potentially hazardous material

- Compliance issues

- Housekeeping issues

- Issues with female staff

- Cameras/recorder malfunctions

So, what is the 'more' that needs to be done?

1) AUDIT CCTV AND OTHER SURVEILLANCE VIDEO FOOTAGE DAILY AS A STANDARD OPERATING PROCEDURE

'Auditing' means 'seeing' what the cameras 'saw'. Auditing of CCTV and other surveillance

video footage should be done daily (continuous investigation) to identify potential issues and threats. Auditing is a dedicated and systematic process that helps address challenges related to live monitoring and alert-based systems. Auditing helps in evaluating analyzing incidents to improve existing policies, procedures, and processes. Concerned personnel should be trained to become video footage auditors, and the audit teams should be rotated to avoid complacency/collusion. Daily auditing of CCTV and other surveillance video footage can also help in adhering to the principles of Kaizen and TQM for business improvement.

2) DOCUMENT AUDIT FINDINGS/INCIDENTS

Audit findings/incidents should be documented in a standardized template to find the root cause to prevent future recurrences. Historical data of such findings/incidents can reveal patterns that can help take better informed corrective and preventive action. If all sea exploration facilities report incidents in a standardized template, relevant authorities can derive business intelligence from the data and take action for the collective benefit of all stakeholders.

3) ENSURE DISASTER RECOVERY OF CCTV AND OTHER SURVEILLANCE VIDEO FOOTAGE – LIKE A 'BLACKBOX'

CCTV and other surveillance video footage must be stored at multiple locations in order to ensure that even if the recorder/storage device is stolen, destroyed or tampered with the data is never lost. Further, any backed-up data must easily be searchable and retrievable; else, it is going to be a nightmare finding the relevant video.

4) DISPLAY DYNAMIC INFORMATION AT RELEVANT PLACES

Document and display details of information that is dynamic in nature in relevant areas. For example:

1. List of authorized staff.

2. List of authorized security personnel deployed at the sea exploration facility.

3. List of habitual offenders/suspects likely to visit the sea exploration facility's premises (a 'Watch out' list).

5) USE A POWERFUL NEW SIGNAGE

"WE AUDIT CCTV VIDEO FOOTAGE EVERYDAY".

One size, one color, one powerful message. Across the nation.

DE-CENTRALIZED SURVEILLANCE + CENTRALIZED SURVEILLANCE = OPTIMAL RESULTS

Organizations with multiple locations struggle with centralized video surveillance due to infrastructure cost, internet bandwidth, and operator limitations. De-centralized surveillance offers higher accountability at each location and better situational awareness, leading to more chances of discovering exceptions.

NEW SKILL – 'CCTV VIDEO FOOTAGE AUDITOR'

In a groundbreaking move, the Ministry of Skill Development of India has established National Occupational Standards for the crucial skill of CCTV Video Footage Auditing. The Ministry of Education has also introduced a course to teach this skill to students in grades 11 and 12. This initiative will not only create new job opportunities and business ventures for those seeking a fresh career path but also for retirees from both the armed forces and the private sector. Additionally, this skill will help activate the millions of CCTV cameras currently underutilized, bringing them out of 'sleep mode' and enhancing their effectiveness.

CONCLUSION

"You see, but you do not observe"—a famous quote by Sherlock Holmes in A Scandal in Bohemia (1891, by Sir Arthur Conan Doyle)—perfectly illustrates the need for human insight in surveillance. While computers can 'see,' it is human observation that truly interprets and acts on what is seen. COM-SUR simplifies and enhances this critical process, leading to more effective and insightful results.

"Cameras don't lie"—but how will you know unless you 'see' what the cameras 'saw'? Don't wait for things to go wrong. Start auditing your CCTV footage with award-winning COM-SUR today.

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.'