Solution Brief

Situational Monitoring
Artificial Intelligence

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Automating Video Monitoring and Event Detection with AerVision's AerWatch

The AerWatch Solution uses Intel® Technology to optimize advanced artificial intelligence and deep machine learning to enhance safety and security and offer greater video monitoring efficiency

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About AerVision

Founded in 2013, AerVision is a technology company developing innovative solutions for enhanced safety and security using state-of-the-art artificial intelligence, computer vision, biometrics, Internet-of-Things, and video analytics. AerVision deploys a number of cutting-edge applications in a variety of industries including aviation, education, correctional facilities, healthcare, government, commercial, mining, and retail.

Creating Greater Efficiency and Accuracy in CCTV Video Monitoring

CCTV and camera systems are nothing new. They've become ubiquitous across a wide variety of industries to help improve security and provide organizations with insights into how people move throughout their spaces. However, manual monitoring of video streams is a tedious and costly process, often resulting in errors and slow response times. In addition, the vast amount of data collected is overwhelming and the inability to process it efficiently leads to underdeveloped insights.

To overcome these challenges organizations across industries are looking to harness the power of AI and video analytics for more efficient video monitoring. The global video analytics market is estimated to reach a value of USD $20.3 billion by the year 2027, up from $7.1 billion in 2022[1]. Meanwhile, many traditional video management solutions don't meet the real-world requirements or use cases customers need. While there are various AI-based CCTV video analytics solutions in market to choose from, it can be difficult to find a solution that provides high accuracy, produces few errors or instances of false alarm, and that fits within an organization's existing workflows. In addition, customers often struggle to determine the appropriate hardware or optimal camera position for their given use case, resulting in an inefficient use of resources and operator time.

To help customers overcome these challenges, AerVision Technologies created AerWatch, an intuitive AI-based CCTV video analytics solution that reduces monitoring workloads and simplifies day-to-day operations for operators by integrating into existing workflows.

AerVision AerWatch: An AI-based Video Analytics Solution

AerVision's AerWatch is a highly efficient and accurate AI-based CCTV video monitoring solution that can automatically detect, recognize, track, and monitor a wide range of objects, people, and events.

It combines sensing and computer vision to automatically enable functions such as human and object detection with activity classification, single and multi-camera target tracking, recognition using biometric information or appearance, and monitoring crowd behavior. AerWatch is a software-based solution that works as an add-on to existing CCTV monitoring systems to function alongside building, security, and video management systems. This enables customers to deploy the solution on their current infrastructure – no additional hardware required.

The solution enables businesses across a variety of verticals—including aviation, retail, and commercial spaces—to enhance safety and security, gain insights into their premises and how people interact with their space, and improve workload efficiency. AerWatch does this by:

- Utilizing advanced technology designed to operate automatically, giving security operators more time and freedom to ignore distractions or "noise" from normal events or people.

- Providing real-time alerts to allow security personal to act immediately and reduce response times.

- Offering a dashboard with real-time analytics showing operators data around the current situation, in addition to historical statistics for insights into events and processes overtime.

- Augmenting CCTV video stream in real-time with virtual lanyards to provide situational awareness, such as understanding who is in a specific area (e.g., whether it's a visitor, the CEO, a staff member, etc) and crowd behavior and movement.

- Identifying precursor events, allowing for timely intervention before a situation escalates.

- Offering compatibility with most major video management systems, a system that can perform load balancing on CPU and GPU cores, and a simple API feature that allows for easy third-party software integration.

AerWatch is a powerful tool that enables companies to implement new capabilities and use cases beyond traditional video security systems. Whether a school, a shopping center, or a warehouse, the solution provides unprecedented insights into the operations of customer locations.

Enhancing Operational Efficiency and Security with AerWatch

AerWatch can be applied for a variety of use cases for customers seeking to improve their level of monitoring accuracy, reduce false alarm rates, and utilize existing hardware for AI-based video monitoring. Whether it's enhancing security or optimizing operational efficiency, the solution provides insights that enable end users to improve monitoring by understanding crowd and object movement, human behavior, and situational contexts such as interactions between customers and staff. These advanced analytics not only help optimize monitoring and improve response times, aggregated data and forecasting capabilities can enable companies to make future forward, data-driven decisions that improve business outcomes.

Key Benefits:

| Enhance safety and security | Optimize video analytic processes for greater efficiency | Reduce manual monitoring workloads | Integrate with existing infrastructure and workflows | Improve efficiency | Get insight into people movement and crowd behavior | Increase accuracy of statistics |

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AerWatch Key Features

AERWATCH

1 Detection

- Object detection and tracking
- Person, bike, and bag detection
- Human pose and skeleton detection
- Vehicle detection
- Air and sea vessel detection
- Animal detection
- Fire risk
- Left/removed object
- Slip and fall
- Vandalism/Camera tampering

2 Recognition

- Face recognition
- Facial expression and analysis (e.g., demographic and mood)
- Number plate recognition
- Gender identification
- Unauthorized person
- Adult/child classification
- Entering restricted area

3 Monitoring

- Trespassing
- Social distancing monitoring
- Occupancy monitoring
- Rule-based alarms (If This Then Do That, IFTTT)

4 Tracking

- People tracking
- Vehicle tracking
- Aircraft tracking
- Object tracking
- Irregular traffic flow
- Bag tracking
- Irregular movement

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Deploying the AerVision Solution

AerWatch specialists begin by mapping a customer's existing capabilities and identifying pain points to recommend the AerVision capabilities best suited to meet their unique needs and desired outcomes. AerWatch also consults with customers on their current video systems to help customers maximize the use of their existing infrastructure. Specialists can help ensure optimal efficiency by recommending improvements such as changing the field of view or small adjustments to camera position and location. In addition, they may recommend supplementary hardware to enable new use cases existing infrastructure cannot manage. The customization portion of the process can be iterative and AerVision works with customers on setting success criteria during the consultation phase.

AerVision also enables customers to get the most out of their hardware by optimizing the solution for Intel® Xeon® processor-based virtual servers, removing the need for expensive, dedicated physical hardware. This can reduce the TCO for customers as Intel® Xeon® processors enable the solution to process a greater number of camera streams with highly efficient computing resources. In addition, by optimizing the solution with the Intel® Distribution of OpenVINO™ toolkit, customers can achieve even greater performance on Intel-based virtual servers.

AerWatch is both an on premise and cloud-based solution depending on customer preference. The solution can receive video feed directly from cameras or through an existing video management system that is being used on site. Once video input is received, it is processed by the AI engine to perform analytics that track, identify, monitor, and recognize humans and objects. The contextual alarm and annotation data is sent back to the video management system or the on-site security information management system to notify the correct individuals with necessary information to enable timely action. Alternatively, there's also a hybrid option for cameras on site where the edge device sends the camera stream from the site to the cloud where AI processing occurs. Actionable intelligence from those video streams then is sent back to the physical site.

As the solution is used over time it becomes increasingly accurate and efficient. AerWatch's AI engine is a continuous learning mechanism, meaning it learns on the job and adapts to new information, enabling even better performance as time goes on.

AerWatch in Action – Example Use Cases

Museum

Challenge: A major Australian museum wanted to improve their efficiency, as their staff were currently tasked with monitoring over 400 cameras across the museum. In addition, they needed accurate statistics about visitors and how different exhibition halls are visited by public.

Aerwatch Solution: Using AerWatch, the customer enhanced their security and gained insight into their customers movement, consequentially increasing the value from their investment in CCTV equipment.

Prison

Challenge: Several prisons needed to count inmates in real time and monitor behavior to predict potential riots or fights.

AerWatch Solution: Using AerWatch, the prisons achieved higher degrees of workplace safety for guards without the need for additional hardware investment.

Conclusion

The AerWatch solution provides highly efficient and accurate AI-based CCTV video monitoring software that integrates into existing customer workflows and hardware to reduce operator workload. It includes capabilities for automatic detection, recognition, tracking, and monitoring for a wide range of objects, people, and events.

Intel Components

Intel® Core™ Processors: Intel's highest-performance CPUs for laptops and desktops, delivering advanced responsiveness, connectivity, and graphics performance.

Intel® Xeon® Processors: Intel® Xeon® Scalable processors handle the heaviest data loads across cloud, enterprise, HPC, network, security, and IoT workloads, AI acceleration, and other advanced capabilities. This combination of technologies enhances data protection and privacy by increasing the performance of encryption-intensive workloads including SSL web serving, 5G infrastructure, VPNs and firewalls, or other networks from edge to cloud.

Intel® Distribution of OpenVINO™ Toolkit: The Open Visual Inference and Neural Network Optimization Toolkit enables developers to build and optimize AI-based computer vision models on Intel® hardware and makes it simple to adopt and maintain code. Developers can take advantage of existing Intel® processor architecture to quickly build, optimize, and scale deep learning and visual inference applications.

Learn More

- AerVision Technologies Website

- AerWatch Solution Website

- Intel® Core™ Processors Product Page

- Intel® Xeon® Processors Product Page

- Intel® Distribution of OpenVINO™ Toolkit Product Page

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Sources

1. Video Analytics Market Worth $20.3 Billion By 2027, MarketsandMarkets, 2022.

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