WHITE PAPER

# THE BUSINESS CASE FOR GORILLA EDGE AI

Implementing Video Analytics is Easier than You Think

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# Overview

System integrators and resellers across industries are struggling to find value-added solutions to meet their edge AI needs, while also running into perceived implementation barriers to getting their projects off the ground.

Located at the forefront of edge AI, real-time video analytics and computer vision advancements, demand for Gorilla Technology's IVAR™ is growing. Gorilla identified three key markets for change - retail, enterprise, smart city - as discussed in the first whitepaper, Gorilla Edge AI: The Future of Intelligent Video Analytics Recorder (IVAR). The market-ready Intelligent Video Analytics Recorder is a complete video management system (VMS) as well as a comprehensive real-time video analytics solution which is ready to meet the demands of both the business and security intelligence fields. With an Intel certification and Milestone verification, companies can easily download and install or integrate this performance-driven edge AI and computer vision software today. Fueled by the need to make sense of large data sets from video applications and the need for AI optimization, several industries are now turning to Gorilla's IVAR.

In research released in October 2018, the global video analytics market accounted for some $2.95 billion in 2017 with expected growth to $15.26 billion by 2026. This would be driven largely by the "falling prices of video surveillance equipment, growing inclination toward advanced technologies, rise in smart cities expenditure by governments and growing application of video analytics for reducing crime rates."

Additional research from May 2019 on the global surveillance analytics market says that companies have completely changed how they approach their own security and surveillance operations with new applications of big data analytics. As noted in the report that includes Gorilla Technology:

> "Rather than relying on manned guarding, passive video monitoring, or after-incident reporting, the latest innovations in surveillance analytics solutions can analyze an organization's total video surveillance operation and alert operators of potential incidents based on preprogrammed detection and alerting capabilities."

And while there may have been a few technical hurdles early on as companies adapted to change, with the advances in analytics algorithms and AI, security personnel now have an added edge in how they manage their complete system.

Companies are already finding several uses for Gorilla IVAR technology, including:

- **Software Platforms:** The Internet of Things, video management software, kiosk and smart signage providers are integrating intelligent video analytics (IVA) for added depth to the data gathered.
- **Systems Integrator and Hardware Vendors:** When IVA is bundled with video management software and hardware devices (from cameras to large servers), it provides added value for access controls, auto-gate and more.
- **End-clients:** Large cities, local governments, enterprises and retailers are seeing applications for security, market planning and business intelligence, to name a few.

As the first certified computer vision MRS partner of Intel® to optimize their solution with OpenVINO™, Gorilla Technology's IVAR is on the pulse of the market, enabling clients to benefit from the Open Visual Inference & Neural Network Optimization toolkit in new and unexpected ways. OpenVINO™ is helping fast-track the deployment of computer vision for edge computing involving cameras and IoT devices, and it's being used to develop solutions that emulate human sight, useful for addressing the growing markets in deep learning and computer vision. It has been used successfully in edge implementations, useful for single, stand-alone device locations like when pointed at a point-of-sale system, in an edge/gateway configuration, used in larger areas

encompassing multiple moving pieces like for large train stations, and in server configurations, which ensure expansive areas like hospitals, airports and smart cities can keep their citizens safe.

And Gorilla isn't only working with Intel®, it's working within the entire Intel® ecosystem, from hardware manufacturers and system integrators to distributors and end clients. Whether that means protecting a business, a school, an entire railway system, Gorilla Technology's IVAR solution can bend and flex to meet almost any need. But it's not just security. The technology is also being used in new and surprising ways to help retailers better anticipate and prepare for spikes in consumer demand. The possibilities are limitless with Gorilla's advanced recognition technology, and there are already several industries reaping the benefits.

# Key Markets and Applications for IVAR™

With Gorilla Technology's IVAR™, companies can expect to see benefits across a host of applications. There are several IVA (Intelligent Video Analytics) types that can be used.

A few key markets have already started implementing this technology, including smart cities, in business and large enterprise settings, in retail and hospitality, and to help protect academia. And while security and safety are at the root of these solutions, governments and enterprises are using IVAR in new and innovative ways, like to ease traffic congestion or better manage customers in a busy retail environment.

## A Few Top Examples Include

### People Detection/Human Recognition

Whether for human detection, facial recognition, identifying an age group, gender, or even specific features like glasses, and clothing color, IVA can help better identify specific features faster, with fewer false positives.

### Vehicle Detection/License Plate Recognition/Vehicle Counting

Specific features like a vehicle's color, type and driving direction can be identified, and IVA can also be used to aid city planners in their quest to build better cities, with insights into traffic hot spots and parking management. This also makes for much happier residents.

### Behavior Analysis

Managing populations to maintain peace is no easy task, but IVA can help by detecting intrusions, loitering, sudden running, crowds and more. This can be helpful in a connected city or even on a school campus.

### Business Intelligence

Easily integrated with retail systems, IVA can also help monitor overall occupancy, people counting and even heat maps so employees feel safe and employers get better insights into performance.

In addition to the benefits above, Gorilla IVAR was recently rated by The National Institute of Standards and Technology. Given the number of solutions available and tested from various vendors, Gorilla received an accuracy rate of 99.47% from the NIST based on its scoring for Ongoing Face Recognition Vendor Test (FRVT).

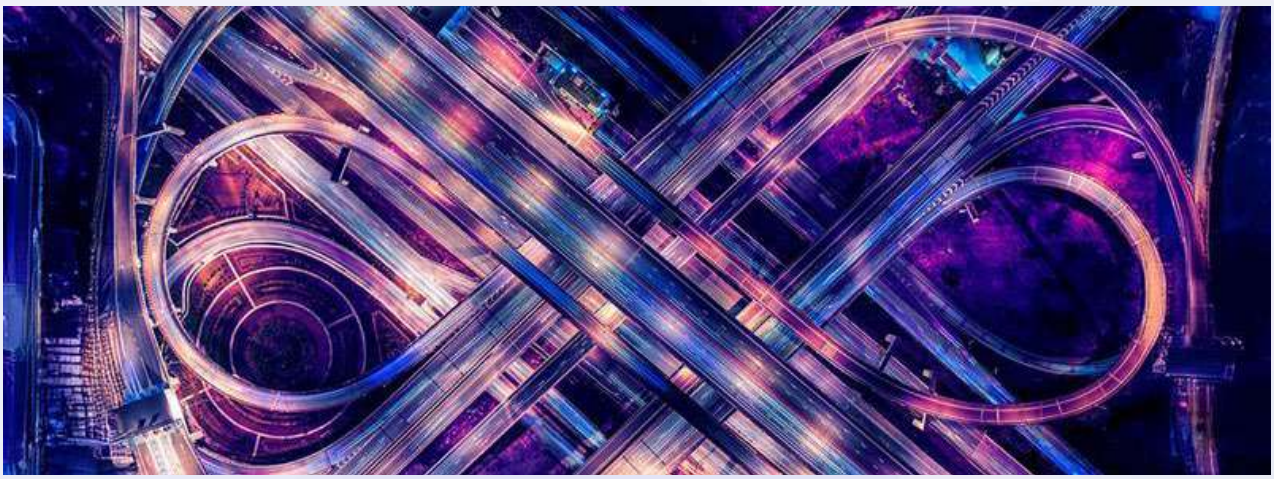
Gorilla's IVAR is also compatible with industry protocols and standards such as ONVIF, RTSP and H.264. It has been verified by Milestone to integrate into their XProtect® VMS software so users can view and act instantly on video analytic events generated by IVAR. Furthermore, devices with built-in cameras, and other IoT platforms easily integrate with IVAR to offer valueadded applications in different verticals.

Key industries that stand to benefit from IVAR deployments include, but aren't limited to: retail, industrial, banking, education, and public safety. Remember, this isn't just another basic security solution for only one market. Gorilla IVAR can also help management teams make more informed decisions about customer purchases and adjust supply based on rising or falling demand.

# An Improved Approach to Public Safety and a Smarter City

Security is at the heart of Gorilla's IVAR, and whether it's a single enterprise, a large retailer, school campus or an entire connected city, there are many ways that each can better manage the needs of their population with this technology.

As cities get faster networks and move to greater connectivity, many can start gaining a better understanding from video AI data to work and make actionable plans that better their overall populations. For example, userspecified cameras can detect and count people in any defined area for set scheduled durations. This can be especially useful when there's an influx of foot traffic to any one location in a city, like at a transport hub, a football game or concert. The added security and watchfulness that Gorilla IVAR brings can be used to help authorities better manage and monitor ongoing events and situations to keep citizens safer.



It can also be used in high-traffic areas to help city planners better manage population movement. In this case, Gorilla IVAR can help gather insight and take snapshots to create comprehensive reports and make informed decisions about next steps.

If there's too much congestion developing on a specific bridge or tollway, city planners will be able to address these issues in their future planning meetings and allocate budgets accordingly, rather than spending on items that their population might not value. For use at large shipping ports or even parking garages, where the tech can also monitor vehicle detection and classification, Gorilla IVAR can help closely monitor large spaces when feet on-the-ground just aren't enough and can't

effectively provide surveillance over large areas. Its training platform learns regional-specific car types quickly, ensuring that it's never limited to a geography. And rather than take jobs away from existing security personnel, IVAR can be used to help security teams do their jobs better and faster.

But it doesn't stop there. Education and campus safety is another important part of what Gorilla IVAR covers. Unfortunately, campus violence continues to rise almost every day. IVAR can help administrators monitor their students in a non-invasive way to ultimately keep them safer. Gorilla IVAR technology enhances any surveillance network by detecting, recording and comparing facial data to known threats or specific people who have already been identified as persons of interest.

Gorilla IVAR can also be used in conjunction with other IoT sensors. This makes it an especially useful tool for protecting students in the event of a sudden fire or natural disaster, helping school authorities be more efficient in getting notifications out to their student body. Whether identifying VIPs to ensure their safety and comfort, providing insights into traffic congestion or notifying authorities to the presence of unwelcome guests, Gorilla IVAR can handle it all.

## Comprehensive Tools for the Enterprise

With many companies today focused on cybersecurity and protecting their systems and networks from malware and various attacks, it's important that physical, on-premises security isn't overlooked. Adding an additional layer of protection for employees with facial recognition can add a significant shield and act as a deterrent to potential physical criminal activity. Gorilla IVAR can be used to detect events in user-defined invisible virtual perimeters around facilities or designate entire areas to watch for intrusions, loitering or directional movement. From there, an alert notification API can be used to integrate push notifications to email or SMS messaging.

In thinking about a 20-story building, for example, security personnel can get a better overall view into the whole structure by using IVAR. Given the average city office building these days has hundreds of cameras, it's a daunting task for any one person (or even a small team) to stay focused on all of them at once. Things can inevitably go missed or undetected and may only get noticed once a security incident has already happened. By then, it's too late.

And unlike traditional internal security and surveillance systems, which are only turned on once people leave a building, Gorilla IVAR can provide helpful monitoring during regular office hours. For example, to ensure employees are kept safe while they're at the office in sensitive environments when confidentiality is important. IVAR helps to introduce greater efficiencies and includes cost reduction and time saved because it no longer necessitates hiring several more people to monitor one building, no matter the size. The technology can also help take some of the burden off regular security personnel so that they are better able to manage and attend to specific needs at any given time.

With the growing number of companies now creating larger "campus" environments - e.g. Googleplex or Apple Campus - and tech tourism on the rise, Gorilla IVAR is one solution to help limit access to only certain people and employees when data and information must be kept from prying eyes.

# Improving Customer Experiences for Smart Retail

Retail is the third key industry now adopting AI technology to help improve customer experiences and deliver actionable insights so that store managers can better plan advertising strategy, staffing management and drive business outcomes. Gorilla IVAR technology provides a comprehensive, real-time, portable analytical tool for single to multi-store operational managers and retail marketers. It delivers video analytic data for store operation overviews of top performing traffic, shopper, revenue count and conversion rates.

Using Gorilla IVAR to identify shopper demographics can help store managers better plan which goods to stock. It can be used to deliver single and multi-store visual overviews of top performing traffic, people count, gender and ages. When combined with point-of-sale data, which tracks what consumers ultimately purchase, conversion rate and shopper preference analysis, managers can better plan and predict product promotion to help move goods off the shelf to prepare for new shipments, for example.

IVAR is also useful to analyze and understand shopper behavior. Cameras can be assigned in stores for real-time and historical data of different brands and product areas to trace a shopper's location, and analyze dwell time, to systematically visualize shopper behavior and product interest. Managers can get a better understanding of the effectiveness of a store’s layout, advertising tactics, and employee deployment to further increase efficiency and performance.

Employee theft, robberies and shoplifting can create millions in lost revenue for retailers. To help aid loss prevention, Gorilla IVAR can be used to monitor both internal and external theft and minimize losses. Aside from the aforementioned uses to monitor shopper behavior, the technology can be used to detect unusual behavior from individuals at point-of-sale systems, such as when a specific object is returned multiple times by the same person.

With Gorilla Smart Retail's metrics dashboard, management can use a dashboard tailored to retail that allows their teams to make decisions and take action immediately to capture market momentum. Customized settings allow store managers to review higher priority, relevant individual store information, and product/behavior analysis to accurately target marketing campaigns.

Overall, what seems like a simple solution for the security and safety of shoppers goes well beyond that to create data-driven results that can help a retailer's bottom line.

## Gorilla Technology + Intel =

# A Successful Strategy for AI

As a close AI-focused partner with Intel®, Gorilla is currently working on integrating Intel® AI products to deliver cost-efficient and scalable solutions to the market. This gives customers more flexibility in hardware options.

Gorilla IVAR and OpenVINO™ work together to support:

## Applicable Devices with Built-in Cameras (Full HD)

- **1-2 Channel:** Tablets, POS systems, ATM's, Kiosks, Signage, and Access Control
- **2-12 Channels:** Drones, Vehicles, and Industrial Computers Analytics Server, AI Platform and Vertical Applications
- 24 analytics channels or above on an expanded server platform
- Industrial automation, smart city, and public safety
- Real-time alerts & post-event analytics

Gorilla IVAR contains state of the art edge AI technology that enables real-time responses to events from edge and IoT devices and security equipment. Users gain sophisticated insights about people, vehicles and moving objects for custom use-cases in surveillance and security, retail and customer service, traffic and parking, staff and visitor management and more.

Intel® is at the forefront of delivering AI solutions today. Based on convolutional neural networks (CNN), Intel®'s OpenVINO™ toolkit extends workloads across Intel® hardware (including accelerators) to help maximize performance.

OpenVINO™ is compatible with popular open source frameworks: Caffe and TensorFlow and will work with Intel®'s traditional CPUs or chips specially made for AI inference — like the Field Programmable Gate Array (FPGA) chips and Movidius Vision Processing Unit (VPU). The technology is already being used by companies like Phillips, delivering high performance, deeplearning inference on X-rays and computed tomography (CT) scans without the need for accelerators.

An added bonus is that the software is helping developers and data scientists speed up computer vision workloads and streamline deep learning accessibility into the future.

By integrating OpenVINO™ into Gorilla's Video IoT Platform, Gorilla creates better optimization on deep learning networks, which contributes to lower deployment costs as more video channels can be analyzed on the same edge devices. Combining video analytics with IoT data can further facilitate explorative business opportunities and operational efficiency improvements. Gorilla's video analytics performance also increases by a remarkable 50%, which has enabled Gorilla edge devices to handle 1.5 times as many video feeds with real-time analytics. This enables superior response times, operational performance and higher asset value, and also removes the need for dedicated GPUs.

Gorilla's Edge AI solution is helping industries become more efficient and safer by improving accuracy while reducing human error through automation. Gorilla offers high-performance video analysis optimized by Intel®'s OpenVINO toolkit to take edge and IoT data and business intelligence into the age of machine learning. This solution offers value-added applications in many verticals like retail, industrial markets, banking, education, public safety and provides advanced dataset services for cloud servers. And as industries see the potential of these devices to improve their day-to-day lives, as well as their businesses and overall safety, interest in the solution will only grow.

Don't get left behind. Find out for yourself how Gorilla Technology's IVAR and custom solutions are driving automation to reveal greater insights for the industries they serve. Integration is extremely important today, and it's easy with the benefits and ease of having a partner in this industry and what Gorilla offers – training, certification, integration support and more. By using the hardware and technology to handle repetitive tasks that require immediate responses, IVAR gives people the ability to see and understand patterns hidden in human behavior. By combining cutting-edge technologies and industry experience, the Gorilla Partner Program is committed to helping its partners deploy edge AI-based computer vision to accelerate business growth across different channels. This is done in part through the 'Gorilla Edge AI Institution' which gives in-depth training and certification on everything from camera set-up to IVA scheduling and beyond.

With Gorilla Technology, you can see the full potential of the Internet of Things and the power that a complete VMS with comprehensive video analysis can have for almost any application in the real world.

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