

# AN INTRODUCTION TO BEHAVIORAL ANALYTICS FOR REALTIME VIDEO INTELLIGENCE



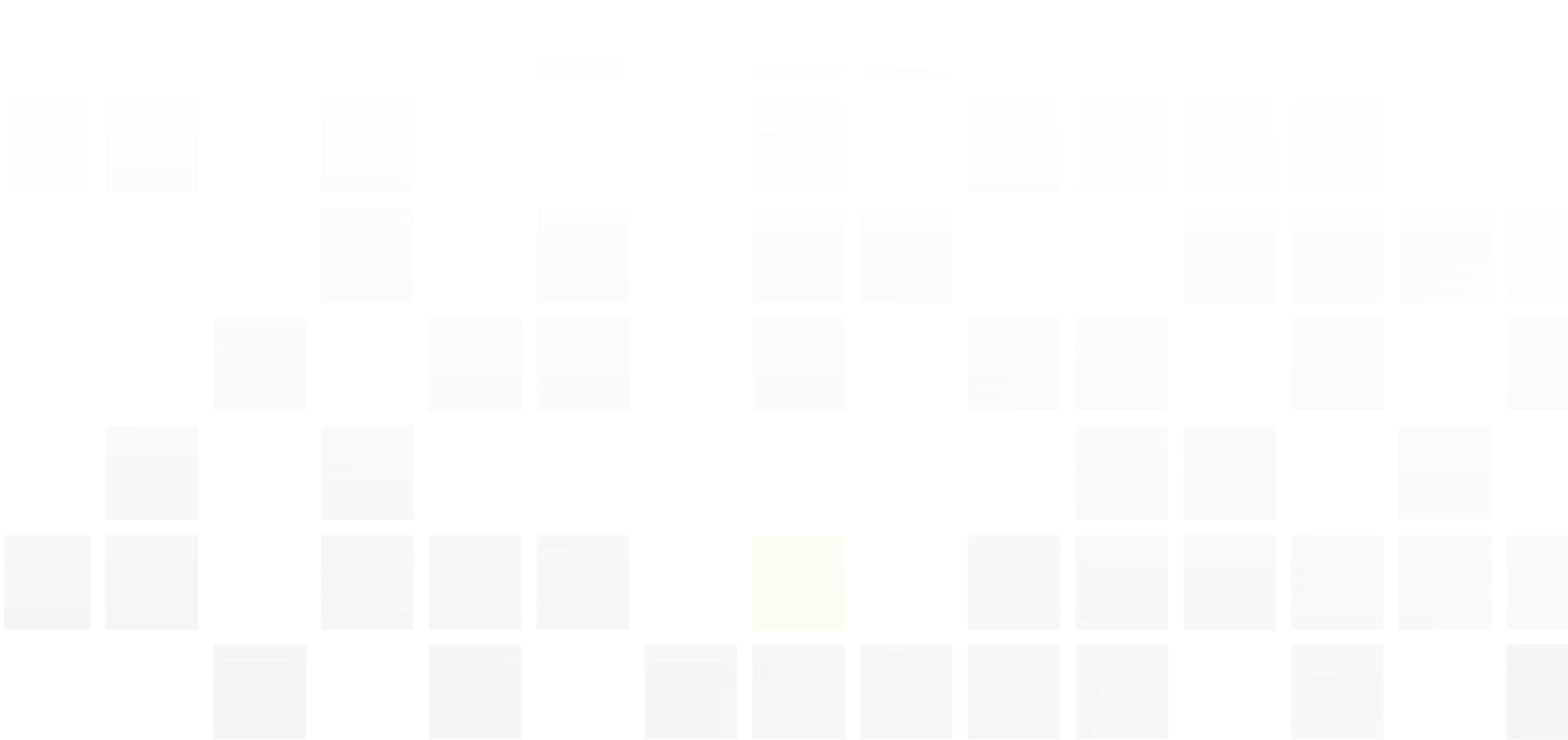
viisights

Intelligence by vision

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# THE VIISIGHTS ADVANTAGE

## Overview

New and emerging security and health safety challenges demand new solutions to best protect people, property, and assets. viisights' innovative behavioral analytics leverage the latest advancements in imaging and artificial intelligence technology to deliver new benchmarks in video intelligence that transcend traditional real-time monitoring and forensics by providing actionable intelligence to minimize liabilities and prevent incidents from escalating.

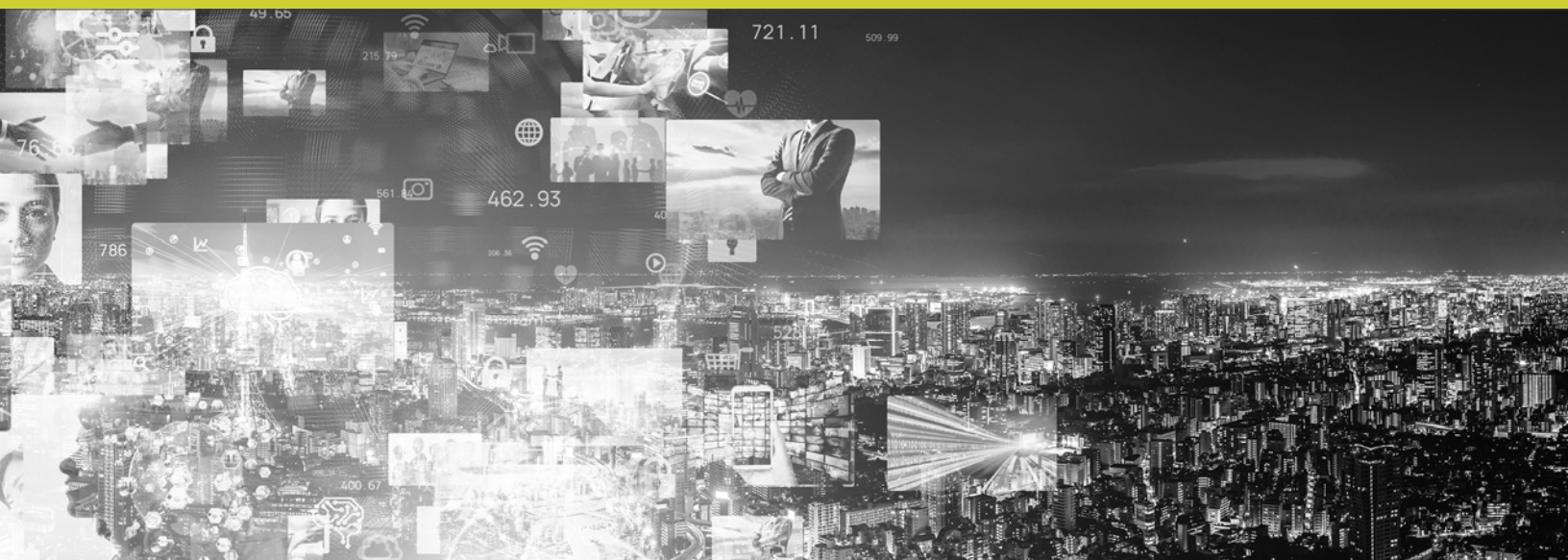
## Why We're Different

Unlike conventional video analytics that use old pixel technology to recognize static objects and classify objects, viisights behavioral analytics employ Artificial Intelligence (AI) to automatically detect, analyze, and understand actions and events. This unprecedented level of video understanding is based on a unique implementation of deep neural networks capable of analyzing and defining specific activities using video streams from conventional security cameras.

viisights' behavioral analytics recognize the behavior of diverse objects and their relevant contexts. For example, an individual moving back and forth in a predefined area may simply be loitering or waiting for a bus. However, if the individual is hovering in the vicinity of an ATM, this may indicate a potential problem. viisights automatically identifies the location as a bus stop or ATM – without any manual setup or calibration.

The ability to distinguish a potentially dangerous situation from a normal occurrence provides security professionals with the unique ability to initiate fast and appropriate responses to minimize or even prevent incidents from occurring.





Other common examples of behavior analysis include the ability to differentiate between individuals embracing or fighting, a parade or a riot, or a person falling versus tying their shoelaces.

viisights uses deep learning technology to integrate the holistic view of the image and the temporal analysis of the video to provide unique event detection capabilities. These intelligent analytics solutions also continuously learn from video streams to define and prioritize dynamic situations with unique signatures that change over time. This machine learning approach to event detection and analysis ensures that viisights behavioral analytics are both scalable and future-proofed.

A new benchmark in video technology, viisights behavioral analytics deliver unprecedented levels of intelligence using commodity NVIDIA GPU processors in a unique system architecture that significantly reduces the hardware footprint required for advanced analysis in near real time.



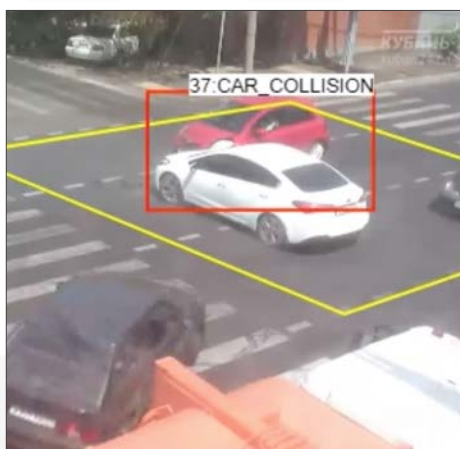


viisights unique capability to transform video streams into actionable insights provides users with myriad benefits, including the ability to...

- Automatically detect and predict events of interest such as violent and suspicious activity, crowd behavior, perimeter (protection) violations, public health violations (eg. COVID-19), traffic congestion and accidents, environmental and personal safety threats, and occupancy and mobility counting.
- Improve security monitoring accuracy and efficiency by eliminating the need for personnel to monitor large numbers of cameras simultaneously.
- Reduce personnel cost associated with monitoring large security systems and responding to false alarms.
- Improve SOC/security personnel performance by allowing them to focus on real events of interest and provide additional services.
- Improve overall safety and security through automatic detection, analysis, and reporting.
- Deliver implementation versatility in the Cloud or locally for one, some, or all networked security cameras.



## Privacy Protection



The heightened level of situational awareness and risk mitigation provided by viisights solutions is further complemented by the inherent ability of their behavioral analytics to ensure personal privacy protections. This is accomplished by analyzing the general behavior patterns of individuals, groups, vehicles, and traffic-flows without identifying faces or license plates. For high-security or law enforcement applications that require identification and authentication functionality, viisights behavioral analytics can be integrated into systems employing face and license plate recognition solutions.

## Key Advantages



### Actionable Intelligence

viisights patented video understanding technology employs cognitive computing and holistic video analytics to understand video more like humans do and deliver intelligence in real-time. A breakthrough in video analytics technology, viisights provides actionable intelligence on the events that matter most to help minimize potentially dangerous situations, reduce liabilities, mitigate risks, and help maintain compliance to new and emerging mandates.

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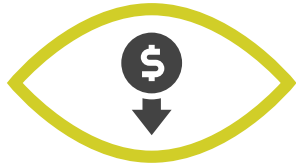
### Autonomous Operation

viisights provides the ability to not only automatically detect in real-time what has happened, but to predict events before they occur based on preliminary behavioral patterns. This autonomous functionality enables the user to operate with the goal of preventing events of interest by responding before a scenario escalates.



### False Positive Reduction

viisights unique video understanding technology makes critical decisions based on a sequence of images in a sliding window of up to 3 seconds – not a single image. This technique dramatically reduces false positives and increases the recall rate, which increases personnel and SOC efficiencies while reducing costs.



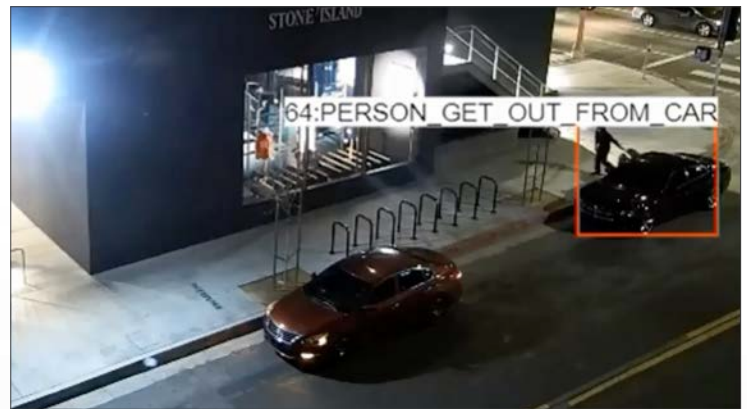
## Tangible ROI

In addition to cost-reductions associated with false alarm reduction, viisights behavioral analytics offer a low cost of entry by leveraging existing video camera feeds. The analytics software solution supports two configurations:

1. Maximizing server utilization – maximum streams per server.
2. Near edge architecture – limited number of streams for low energy consumption device.

“viisights behavioral analytics offer a low cost of entry by leveraging existing video camera feeds.”

viisights behavioral analytics are ideal for a wide range of use cases including safe and smart cities, transportation hubs, banking and financial institutions, corporate campuses, and education campuses.



Learn more by visiting  
[viisights.com/solutions](https://viisights.com/solutions)



# INDUSTRIAL AND MANUFACTURING FACILITIES

# Enhance Overall Safety at Industrial and Manufacturing Facilities with Intelligent Behavioral Recognition Video Analytics

The risks associated with safety at industrial and manufacturing facilities are far reaching, going well beyond the most critical concerns related to personal safety. Safety violations can bring operations to a standstill – impacting production schedules, throughput and product deliveries for prolonged periods of time – which are all detriments to an organizations' operations and profitability. Product liability is another huge concern for customers who may be affected by defective products across every category of industry – from automobiles to jet engines and consumable goods to pharmaceuticals. In a split second, a single safety violation or accident can also cause irreversible damage to your organization's otherwise stellar brand. From any perspective, safety issues impact virtually every aspect of industrial and manufacturing business operations.



One proven way to increase safety at industrial and manufacturing facilities is with heightened supervision. The higher the degree of supervision over employees and processes, the lower the probability of safety violations and accidents. Video surveillance technology has long been heralded as a highly efficient means of increasing supervision, but it requires the vigilance of dedicated "live" supervisors to continuously monitor workers and processes. This



has proven to be a challenge at even modest sized facilities where dozens, if not hundreds of cameras may be deployed across a single facility – each requiring the attention of trained personnel to monitor, detect and react to possible safety violations. This is both an inefficient use of trained personnel and prohibitively expensive, especially at facilities that operate extended or continuous shifts.

## Intelligent Video Analytics are Highly Effective and Cost-Efficient

viisights intelligent behavioral recognition analytics provide the full-time monitoring and supervision solution industrial and manufacturing facilities demand to remain efficient and profitable. Utilizing existing video security cameras, viisights AI-driven video understanding technology automatically



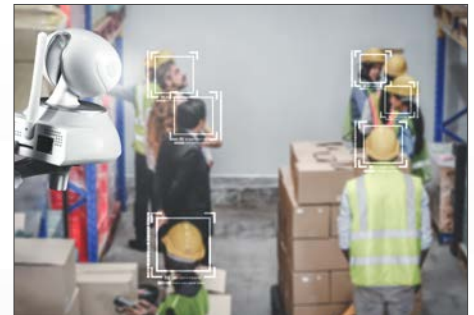
detects pattern-behaviors of interest in processes, worker activity and environment hazards both automatically and autonomously. When an event of interest is detected, designated personnel are immediately alerted to proactively help prevent the safety violation from happening or escalating further. This virtually eliminates the need for live supervisors to be glued to watching video monitors or the likelihood that they miss a potentially harmful safety breach due to everyday distractions as simple as answering a phone or using the restroom.

In addition to increasing overall safety and productivity, viisights intelligent behavioral recognition analytics leverage industrial and manufacturing facilities' current video security systems, further increasing their return on investment (ROI).

viisights behavioral recognition are ideal for a wide range of industrial and manufacturing applications, including:

### Worker and Operations Safety and Compliance

- Compliance
  - Individuals not wearing protective helmets, clothing, or other safety/protective equipment
  - Visitors and employees not wearing or wearing face masks
- Unusual Behavioral
  - Person falling or laying on the ground
  - Person running
- Safety
  - Vehicles or persons in unauthorized or hazardous areas
  - Person or vehicle moving in the wrong direction
  - Proximity alerts when safety distances between people and/or equipment are violated
  - Person is getting closer to a moving vehicle
  - People gatherings and density to maintain occupancy limitations





## Environmental and Life Safety

- Smoke and fire detection
- Hazard detection – misplaced objects, spills and refuse piles

## Security Threats

- Security and protection against unwanted intruders, thieves or vandals
  - Violence detection
  - Weapon detection
  - Vandalism detection
  - Tailgating



## Process Management and Production

- Blocked warehouse aisles or loading docks
- Misplaced equipment
- Behavioral workflow monitoring for person and/or vehicle

Conventional video security cameras and analytics simply are not capable of making human-like distinctions that viisights behavioral analytics deliver to industrial and manufacturing facilities.



Built on a foundation of advanced Artificial Intelligence (AI) algorithms that detect and analyze video content in real-time, viisights intelligent video analytics provide real actionable intelligence. This high level of video understanding is accomplished by learning to distinguish between common occurrences like a person tying their shoelaces versus falling to the ground, or items moving smoothly on a conveyor belt versus piling up. The same levels of intelligence can be applied to automatically detect vandalism,

fender benders in the parking lot, and even the difference between an individual brandishing a cell phone or a gun.

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More detailed benefits of intelligent behavioral recognition include...

### **Prevent Trespassing or Entry Into Hazardous or Restricted Areas**

Industrial and manufacturing facilities typically endure continuous activity with high levels of pedestrian and vehicular traffic moving about 24/7/365. Suppliers, vendors and other facility related service personnel also need easy access to protected areas where facility support services such as warehousing, electrical or water services may reside. This poses a significant challenge for operations, safety and security management tasked with monitoring numerous cameras in real-time. viisights adds video intelligence to conventional camera systems with the ability to automatically identify and notify authorized personnel when unauthorized individuals or vehicles have entered specified secured areas.



### **Maintaining Workplace Safety Compliance**

Automatic real-time detection of unsafe or suspicious behavior and events can initiate immediate remedial action to help maintain compliance and prevent potentially harmful incidents from happening or escalating. Whether applied to dozens or hundreds of camera video streams, viisights intelligent behavioral recognition ensure that events of interest and potentially threatening situations never go undetected. Designated supervisors are notified the moment a potential safety violation is detected so they can take immediate action.



## Vehicle Safety

Driving onto and around the grounds of industrial and manufacturing facilities can be a real challenge and liability for facility management. viisights intelligent behavioral recognition can help improve pedestrian and vehicular safety and traffic fluidity by instantly detecting abnormalities such as car and pedestrian accidents, vehicle stopped in forbidden area, vehicle parked a long time, vandalism, theft, and overcrowded parking lots, as well as unauthorized vehicles entering sensitive areas, effectively reducing risks and liabilities.



“ viisights behavioral recognition analytics can determine group density (classified as “low”, “medium” or “high”) to help enforce occupancy compliance requirements. ”



## Occupancy, Social Distancing, and Group Density Analysis

Even prior to the pandemic, industrial and manufacturing facilities are required to comply with strict occupancy restrictions. viisights behavioral recognition analytics can determine group density (classified as “low”, “medium” or “high”) to help enforce occupancy compliance requirements.

## Identify Personnel With and Without Masks

Many organizations and municipalities have initiated rigid compliance mandates for protective face coverings. Lack of compliance can lead to fines, exposed liabilities to legal action and more. viisights behavioral analytics can automatically detect if an individual is or is not wearing a mask or mandated protective gear in specified areas.



## Environment and Life Safety

Virtually every industrial and manufacturing facility is required to have fire and smoke detection systems in place. viisights intelligent video analytics can supplement these systems to detect fire and smoke in surrounding outdoor areas where these systems are not deployed. Personal safety is improved with automatic alerts for slip and fall situations, or close proximity to a dangerous areas or equipment.

## Improve Emergency Response Times

viisights intelligent behavioral recognition notify authorized personnel to initiate action the instant a defined event of interest or an imminent threatening situation is detected. This unique ability to detect events of interests in behavior or operations in all but real-time greatly reduces response times to potential and active events which can help to better protect people, property and assets, and minimize exposure to liabilities.





### Better Personnel Morale and Resource Utilization

Nothing makes workers happier than a clean and safe environment. The ability to autonomously detect potential hazards like chemical spills, basic grounds cleaning or snow removal, or individuals in need of basic assistance instills peace of mind and confidence. Proactively addressing issues related to personal wellness, grounds keeping and general maintenance also enhances the allocation of personnel to better manage specific tasks.

### Workplace Violence and Weapons Detection

Every business environment is challenged with detecting and preventing workplace violence. Unfortunately, this also includes active shooter events. viisights' advanced AI-driven violence detection capabilities provide a powerful tool to proactively detect and help prevent workplace violence from happening and escalating. In addition to physically protecting employees and sustaining normal business operations, the ability to proactively prevent workplace violence is a smart business practice.



### Behavioral Workflow Monitoring for Person and/or Vehicle

Every manufacturing facility employs processes and workflows that if violated can result in major safety incidents or interfere with production. The ability to quickly detect and alert personnel of potentially disruptive incidents is crucial in every manufacturing and industrial facility. Alerts on such scenarios of interest can be created by viisights behavioral workflow monitoring application (coming in 2022).



### Leverage Existing Investments in Video Technology

viisights intelligent video analytics offer a low cost of entry by leveraging existing investments in security camera systems. The innovative behavioral analytics solution also offers versatile configuration options to maximize server utilization with near edge architecture.



### A Scalable, Future-Proof Solution

viisights intelligent video analytics are infinitely scalable to accommodate even the largest industrial and manufacturing facilities and surveillance and security networks. Any number of video cameras can be implemented and added at any time to accommodate your timing and budgets.

Learn more on how to make industrial and manufacturing facilities safer and more efficient by visiting  
**[viisights.com/solutions/industrial](https://viisights.com/solutions/industrial)**