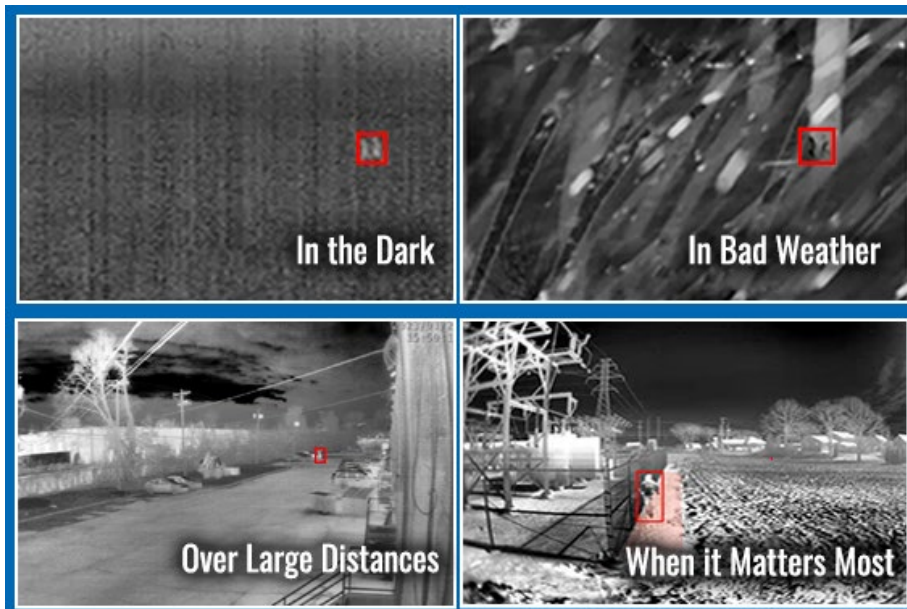


# The Power of Thermal Analytics & AI for Robust Perimeter Security

## *A Practical Approach to Unbeatable Perimeter Security*

There has long been a need for a high-performing intruder detection solution to protect outdoor assets - whether it's critical sites like the power grid with concerns about sabotage, or commercial locations like auto dealers and construction sites that need to stop theft and vandalism.

While there are good solutions for protecting well-lit outdoor areas near an asset, deploying a viable perimeter solution that detects at distance without fail, while also



limiting false alarms in the tough outdoors – in an elegant and affordable way - has been a tougher problem to solve. Yet it's the outdoors that demands performance, because security starts at the perimeter.

These outdoor environments present unique challenges: large, open spaces, low or no

light, and constant environmental changes. Perimeter systems are designed to detect movement but outdoors, everything changes, all the time. Wind, animals, and weather like rain and snow can all lead to false alarms or missed detections, making the task even more difficult.

Fortunately, by combining thermal analytics, geospatial capabilities, and Artificial Intelligence (A.I.) solutions, security professionals can now achieve real-time, proactive, and reliable outdoor security even for the toughest perimeter application.

## Thermal: The Foundation of Reliable Outdoor Detection

A viable security system starts from a simple premise – detect first, and never miss. That’s why thermal has become a go-to technology outdoors. These cameras, which work by measuring heat differences, can “see” in the dark, bad weather, and bright sun – basically, all the time. They can also detect over large areas common to perimeter applications. And they are tuned very close to human body temperature, which is why thermal is often called the “perfect people detector.”



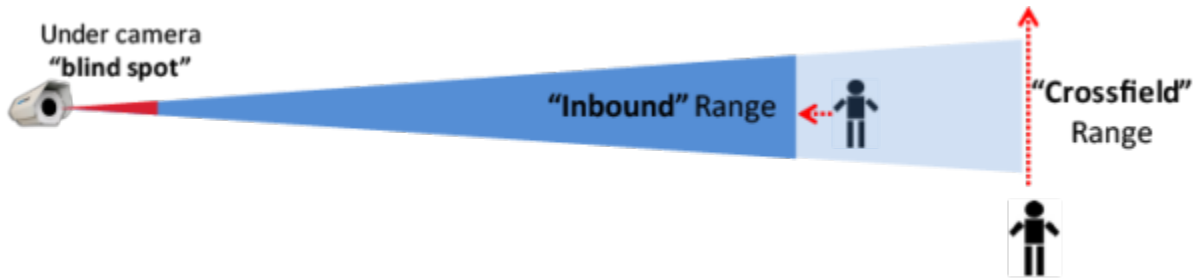
However, not all thermal cameras are alike. Some cameras are good for “seeing in the dark” but produce a lower quality image that lacks the details needed for reliable automated performance. When the goal is to precisely detect intruders over hundreds of feet – or hundreds of meters – a more sophisticated approach is needed.

When your assets are at stake, the details of security images matter. Thermal imagery works by converting temperature into shades of gray – objects that are warmer

look whiter against a background, while cooler objects are darker. At the source, this creates megabits of data, which would create a bottleneck transmitting across the network. As such, most cameras remove these details from the imagery by reducing the dynamic range and compressing the data set, making it easier to transmit across the network. But compressed video lacks the finer details needed for detection performance at longer range.

On the other hand, cameras that employ edge-based processing have the power to analyze the raw thermal video, yielding a much richer set of information for more

accurate results, even in low contrast situations like fog and humidity, when the background and the intruder are very close in temperature.



Edge processing yields another benefit, which is the ability to accurately detect an intruder walking directly towards the camera, one of the hardest situations for a smart camera to perform, especially at distances common to perimeters. Because you never know which direction the intruder will travel, always ask your camera manufacturer if their detection specs are based on Inbound or Crossfield distances, so you don't leave yourself vulnerable to missed detections.

## Combining Thermal with Visible for Comprehensive Security

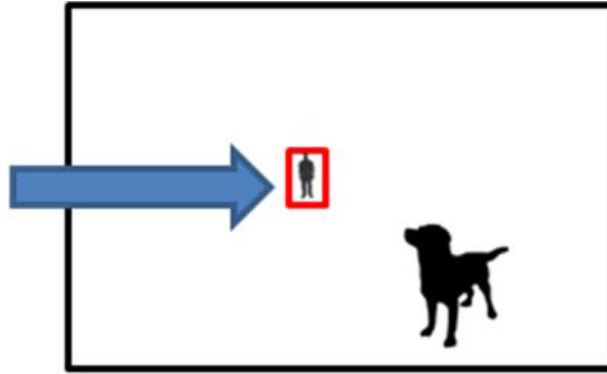
While thermal is a great outdoor detection technology, layering in a complementary capability such as visible imaging provides a redundancy level of detection for outdoor environments. This can be achieved by considering "dual-sensor" cameras that provide both a thermal detector and a high-definition visible in the same device.

Using visible and thermal capabilities in tandem to provide dual-sensor analytics can compare the detection from both in real time for the best result. Visible also provides color that can help with additional context during an event.

## Going the distance: Leveraging geospatial analytics

Quickly and accurately identifying a threat is a baseline for a perimeter intrusion detection solution. Being able to determine the distance, size, speed, and bearing of all pixels in the scene can provide the camera with "depth perception" to create an even more accurate alarm.

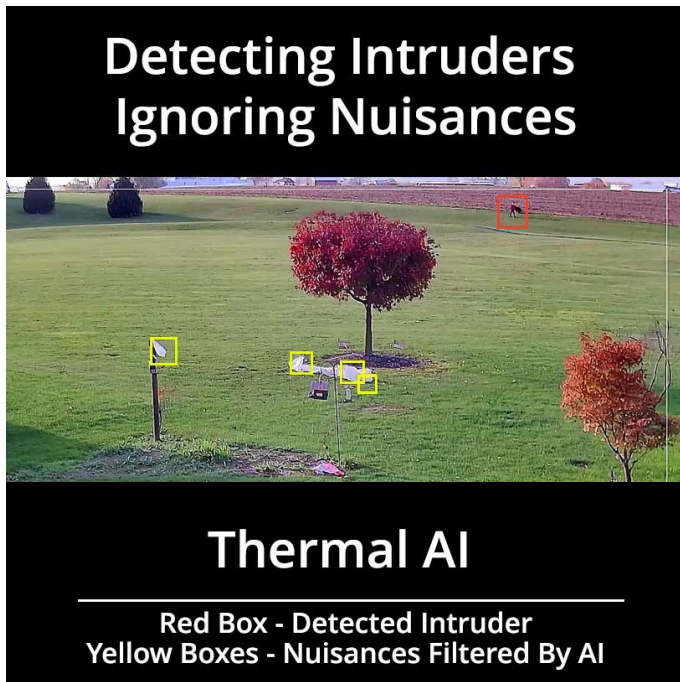
At a distance,  
the intruder  
looks small,  
but has to be  
detected



The animal  
close to the  
camera looks  
large, but must  
be ignored

Cameras that include a comprehensive geospatial framework use the tilt, yaw and height of the camera off the ground— three coordinates in space. This lets the camera calculate the actual size, speed, bearing and location of every pixel in the scene – in real time - so it can more reliably determine between a human-sized intruder from smaller objects that are more likely an animal. This can greatly reduce false positives in the outdoors while ensuring an accurate initial detection.

## How Thermal-based A.I. Can Reduce False Alarms



Once your system has determined a high likelihood of an intruder, the next step is to verify whether it represents a true threat. Until recently alarm verification was performed by an operator in the monitoring center. But now, advanced A.I. solutions are a key contributor to reducing false alarms and increasing efficiency of security operation staff.

Most A.I. software is designed to operate on visible cameras over shorter distances and provide good results. However, A.I. used for perimeter applications at night or in bad weather is much less effective,

because it can't accurately see the object.

Here again, a better choice is to consider solutions that have A.I. on the thermal streams, because these systems don't need light or color to operate and can classify an object as a person vs an animal very reliably in common perimeter situations.

And as the A.I. library evolves, verification evolves as well; continually improving when and what determines an alert. Being able to automatically verify a threat can enhance a risk mitigation strategy and can lead to significant Return on Investment/Equity (ROI), knowing that when there is an alarm, there is a high probability a real threat has been detected and it's time to take action.

Thermal A.I. delivers further economic value because reducing outdoor nuisance alarms directly reduces costs. This efficiency not only conserves manpower and limits wasted time - operators and guards can concentrate on genuine threats, protecting more sites without increasing resources – it also enhances customer satisfaction with better security, unlocking substantial value.

## Conclusion

A detection-focused philosophy that combines thermal analytics, geospatial analytics, and A.I. solutions provide comprehensive and proactive, security for outdoor environments. Solutions rooted in this philosophy give customers the ultimate peace of mind amidst any outdoor environment by integrating advanced technology to provide the highest accuracy level for intruder detection.

## About SightLogix

*For over 20 years, SightLogix's smart thermal SightSensors have provided unmatched perimeter security at sites where detection is critical. Our mission is to deliver cutting-edge security solutions with edge-based video analytics, Thermal AI filters, wide-area coverage, and geospatial target tracking, purpose-built for success.*

Learn more at <https://www.sightlogix.com>.

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