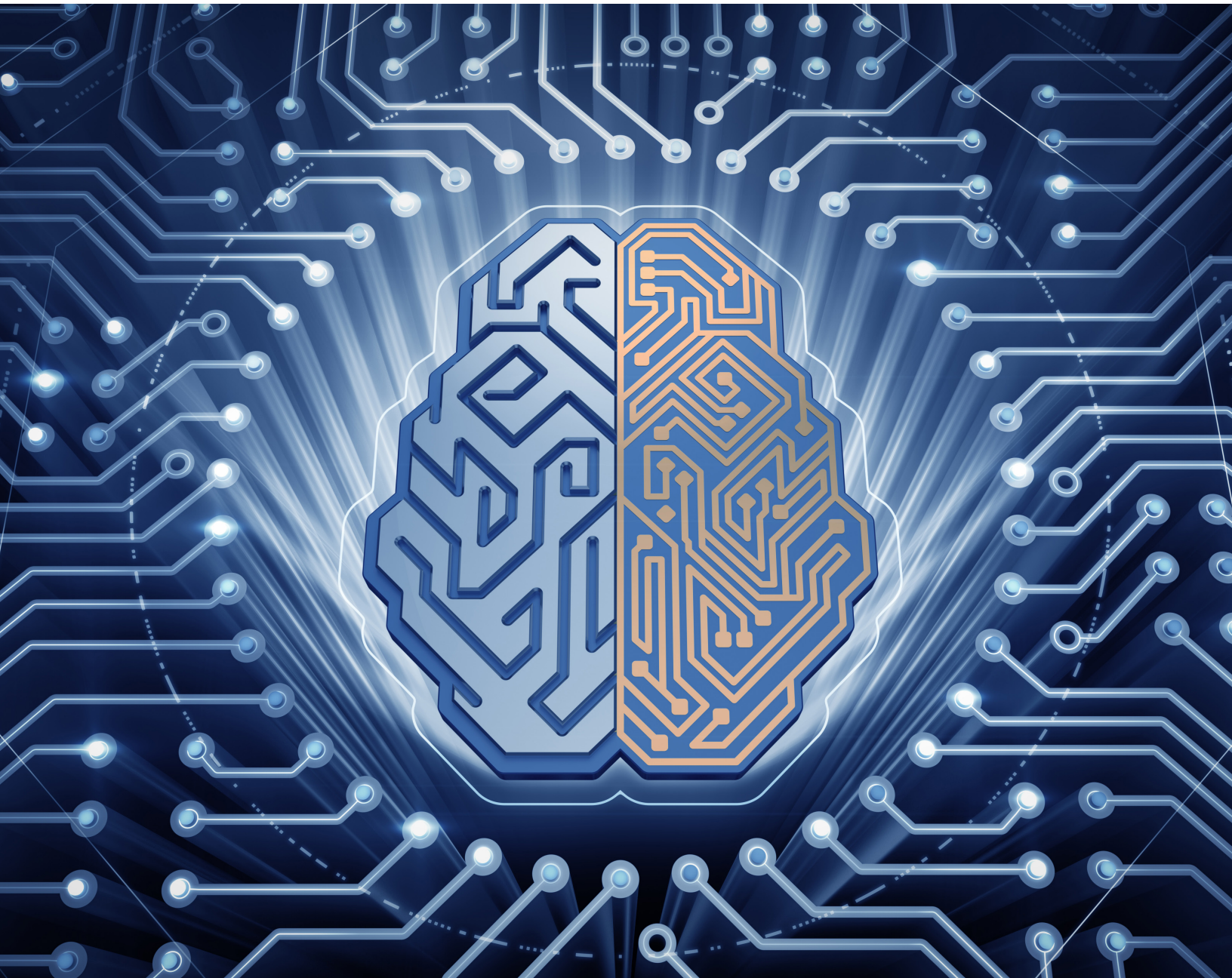


# The ReconaSense AI Platform for Physical Security

By John Carter President/CTO ReconaSense Inc.





## AI: A Tool for Learning

Artificial intelligence (AI) is the tool that allows machines to learn. When properly trained, machines can adjust to their environment and perform tasks much like humans. Our perceptions of AI run the gamut from loving the idea of self-driving cars, to fearing killer robots from the future. The reality is that a properly configured and trained AI machine can save lives.

At ReconaSense, we have built a solution that incorporates Artificial Intelligence on an Artificial Neural Network (ANN). Our system provides real-time analytical processing of aggregated data from a wide array of intelligent sensors, access control activity, video systems and big data repositories. We have created

a machine that enhances situational awareness by identifying anomalous events, enabling automatic risk adjustment and providing detection of threat conditions before an event occurs.



As humans, we all have limitations. We all need sustenance and rest. Our attention spans typically deteriorate in less than ten minutes.

As biological entities, we sometimes find ourselves in need of stimulants like coffee followed by occasional restroom breaks. We can be easily distracted. A machine doesn't need food, rest or breaks and has an unlimited attention span. It doesn't discuss sporting events or personal interests. A machine can be used to do those tasks that require constant data evaluation without a break. It can sift through endless mounds of data looking for that one key piece of information that the human needs to know, but might miss.

**“We have created a machine that enhances situational awareness by identifying anomalous events, enabling automatic risk adjustment and providing detection of threat conditions before an event occurs.”**

In the physical security environment, security officers are tasked with life-safety, employee accountability and asset protection. They are provided with tools ranging from handheld weapons to fully equipped, state of the art security operations centers (SOCs). SOCs may be fitted out with views of countless cameras, alert notifications and a variety of control systems. Officers are expected to monitor everything and respond to anything that happens on their watch. In many cases, they are using outdated systems that lack the ability to interoperate and provide real-time actionable intelligence in a single view. Officers are forced to interact with several systems and maintain a working understanding of very different user interfaces. Multiple studies have shown that human attention spans are unable to keep pace in this environment. The result is decreased life-safety and security.

Much has been written recently about the growth of deep learning, big data analysis and the IoT (Internet of Things). Some companies have added support for some IoT devices to provide additional data within physical security. Others have provided post-event data analysis to improve policies and procedures. While those are worthwhile endeavors, they fall short of the mark and cannot be considered an AI solution.

## Artificial Neural Network Intelligence

At ReconaSense, we consider ourselves to be the first in our industry to produce a true AI solution. Using AI, we have developed a solution that constantly and automatically evaluates every event. The system can be configured to automatically adjust risk levels as events occur and in so doing, eliminate threats before they occur. Alerts and notifications of threatening conditions can help officers avert disasters before they unfold.

**"We consider ourselves to be the first in our industry to produce a true AI solution."**

Based on an Artificial Neural Network, the system treats everything as a data point. We classify all data points as individual entities that are part of the whole. For example, a person is an entity, a sensor is an entity, a camera is an entity and so on. The ANN works very similar to the human brain. Our brains are constantly scanning our sensors for activity and adjusting in real-time. If it starts raining, we go inside. If we touch something that is too hot, we pull back. Over time the human brain learns to make these decisions in advance. We may take an umbrella because it is likely to rain. If we smell smoke, our brain has learned to look for fire. For humans and machines, more data leads to better decisions. ReconaSense is introducing that brain to the physical security industry where it is sorely needed.

Like the brain, the ANN grows as the needs of the organization increase. While babies start with simple needs such as food and warmth, they quickly begin understanding the more complex data you provide them. Similarly, a facility may start with a few entities that need constant evaluation, and then grow to thousands or millions as needs increase.

The ANN works on a few basic principles. It receives a wide array of input data that affect internal variables. The ANN evaluates the data based on internal information and sends results to several output variables. The output response can back-propagate and start a new process with that additional intelligence.



The ReconaSense ANN is an electronic brain at the center of the physical security platform. As entities such as people, cameras and sensors are active, the ANN examines the activity and scores it against what it knows to be a risk. When the ANN identifies a high-risk situation based on those scores, it acts like the human brain. It alerts officers and adjusts the facility's security systems per its instructions, to counter that risk.



## ReconaSense Safe Campus

A real-world example of where the power of this solution can save lives is a school or university campus. If fully deployed, ReconaSense would have a database of students, faculty, employees, contractors, parents and other related persons. Additionally, full deployment would integrate the entrances, cameras with video analytics, and even specialized sensors such as gunshot detection systems.

The ReconaSense Safe Campus solution can start with students boarding school buses. The system has information on the bus, the driver, the route and the students who belong on that bus. A ruggedized mobile tablet that includes a credential reader can be installed on the bus and be connected remotely.

When the student boards the bus, they present their ID card to a credential reader that verifies that they are authorized on that bus. Their face on the tablet screen instantly changes from absent to present in view of the driver. If a bad behavior occurs on the bus, the driver can tap the student's face on the tablet screen and add the incident to the system. The recorded incident can then be dealt with at school the next time the student arrives. It will also become part of the student's activity log for future reference if needed. Additionally, if a student attempts to exit the bus at a wrong or non-designated stop, the driver will be alerted and can override the action. Even the route of the bus can be tracked to verify that it is following school rules.

At the school, ReconaSense becomes extremely powerful. The system monitors activity via access control, video systems and sensors. A version of the app used on the bus can be available to teachers, counselors and faculty to aid in adding pertinent information that would indicate that a student or other individual is experiencing issues.

As authorized persons arrive at the school, the system grants them access and provides a real-time report of who has arrived or is arriving. Resources people such as security, safety officers or even hall monitors can also be provided an application that runs on a smartphone. This app can be used when life safety issues arise. It can alert security staff, or even bar entrance to non-essential personnel to the school.

As a student misbehaves, in the classroom or around campus, a student's risk level can escalate according to the school policy. For example, if a student begins

to have increasing conflicts with others and posts threatening comments on social media, his or her risk level may reach thresholds defined by the school that automatically prompt intervention by a counselor or other staff member. If that risk score continues to escalate, the student's case may escalate to the principal. At some point they may even be identified to law enforcement as a potential threat. When the threat level is high for an individual student, their presence can be monitored and tracked via access control and video cameras to passively alert teachers and faculty to the potential issue.

If video analytics are used at the school's main entrance, people can be identified as they approach or enter the school. If they are on an alert list, they can be monitored or approached as needed. If an incident did occur, their video history can be reviewed to identify possible accomplices to the incident.

If specialized sensors such as gunshot detectors or connection to the fire system are integrated, ReconaSense listens to those sensors and can trigger other systems as desired by the school.

In summary, ReconaSense A.I. Platform provides better data, faster. It can make real-time life-saving decisions that immediately alert security personnel to high-risk situations, giving more precious time to take action before and after a crisis ensues.

## Safe Campus Use Case

A properly deployed ReconaSense system could have made a difference before, during, and after a recent school shooting with:



Advanced notifications that the school shooter was developing high-risk behaviors that could lead to an assault. At some point, the principal and/or a counselor would have been informed that a discussion with the student should occur, potentially preempting the incident.



Detection of "blacklisted" people as they approach a facility, not allowing them to enter school with a large bag if that was a concern, and notifying personnel.



Automatically activating mass notification systems to alert first responders, staff, students and parents of the situation.



Gunshot detection that could have immediately granted emergency personnel remote visibility to video cameras. This assists in dispatching appropriate resources to mitigate damages more intelligently.



ReconanSense MobileMuster, which empowers students to check in as either "safe" or "need help" on their smartphones. This information can be shared with parents while providing GPS coordinates to accelerate assistance.



Restricted entrance to everyone but emergency responders.



Accelerated investigations and case management following the incident, featuring a unified event log that helps police connect the dots faster.

©2018 ReconaSense, Inc. All rights reserved.