



WHITE PAPER

# Radisy's Computer Vision for IoT, Security and Authentication Use Cases

## Adding Network Based Programmable Intelligence to Real Time Video

Today's 5G and private IoT networks bring significant increases in uplink performance, bandwidth and speed, along with the ability to support edge computing. These performance advantages enable the increased use of real-time audio and video. However, while real-time audio and video streams have already existed in carrier and enterprise networks for decades, they have not been actionable.

Recent advances in Artificial Intelligence (AI) and Machine Learning (ML) technology are game-changers in enabling Communications Service Providers (CSPs) and Systems Integrators (SIs) to analyze live video and audio traffic in their networks and monetize it. AI and ML-based media analytics are not new, but they have now reached a level of maturity where they are incredibly accurate and economically viable.

One of the most powerful tools for a wide variety of AI and ML applications is **Radisy's programmable Computer Vision**, which uses software processing of video streams to "see" in real-time. With this, CSPs and SIs can program the Radisy's platform to provide instruction on "what to look for" in an existing real time video stream—without any upgrade to end point equipment. This cost effectively enables new enhanced security, IoT, remote monitoring applications, and more. Computer Vision enables these applications to become mainstream, **at the high scale and low cost required.**

**Radisy's Media Analytics Solution** enables computer vision in a scalable and cost-effective manner. Radisy's Media Analytics is the combination of the Radisy's Media Server and optional advanced analytics features such as Radisy's Computer Vision. Rather than building media processing into end devices, service providers can use their networks' media processing to keep media analytics centralized, cost-effective and scalable. The benefits of Radisy's Media Analytics approach include reduced costs and reduced time-to-market, with the increased ability to monetize real-time video through analysis of the data.

## Radisys' Media Analytics Solution

Radisys' Media Analytics solution leverages a Radisys industry-leading Media Server platform that is deployed in 200+ global fixed and mobile networks. Within a single platform, Radisys enables voice and video processing, voice and video mixing, other Media Analytics features such as voice biometric authentication and "command word" speech detection for speech analytics, and now Computer Vision capabilities for video analytics.

With the Radisys Media Analytics solution, the source video from multiple external end-points (e.g., cameras) can be aggregated and processed within the media server. A wide variety of processing can be performed in the network, such as: combining multiple video streams into a single stream for redistribution, on the fly transcoding and transrating of streaming videos to ensure the end users get the best quality experience according to the capability of their devices and network. The integrated Computer Vision capability and associated APIs on the Radisys platform provides an additional layer of advanced media processing that enables application developers to provide programmable instructions on what to "look for" in the video.

The platform provides a standards-based interface to the application server so that every "event" that is identified in a video stream via the programmable instructions is sent to the application for further action or is appropriately labeled for storage in data lakes for analytics and business improvement purposes.

The Radisys Media Analytics solution provides the following benefits:

- On-premise support for local processing of media content with security or privacy requirements, eliminating the need to send sensitive content offsite to cloud-based processing solutions.
- Built-in Computer Vision capabilities to enable different inference operations to be applied to individual media streams (for example: supporting face recognition on some streams and object detection on different streams).
- High-density and scalability, leveraging best-in-class hardware assist technology that is optimized for AI and ML frameworks and algorithms.
- In-network processing to allow inexpensive video cameras to simply forward video streams rather than requiring video cameras to support complex compute functions.
- Easy software upgrade to an existing Radisys Media Server.

## COMPUTER VISION: Simple and Complex Events

Computer Vision is the ability to recognize events and actionable information in real-time media streams without human intervention. Accuracy of inference and high-performance, cost-effective solutions are required to meet the fast-growing demand for new and innovative applications in this domain.

These events can be as simple as...

- **Motion Detection:** Seeing motion where there shouldn't be any or not seeing motion where it should be seen
- **Object Detection:** Seeing and classifying objects such as an unattended suitcase at an airport
- **Object Counting:** Identifying and counting specific items passing the camera's field of vision

Or as complex as...

- **Object or Image Recognition:** Recognizing specific objects such as license plate numbers or parking stickers
- **Facial Recognition:** Identifying a face based upon an existing database of known facial images
- **Emotion Recognition:** Identifying an emotion in a specific image in the camera's field of vision
- **Age and Gender Recognition:** Classifying age and/or gender from face detection

## Enabling Multiple Use Cases and Monetization of Media Streams

Radisy's Media Analytics platform—deployed in-network for real-time voice and video stream processing can support and monetize multiple use cases.

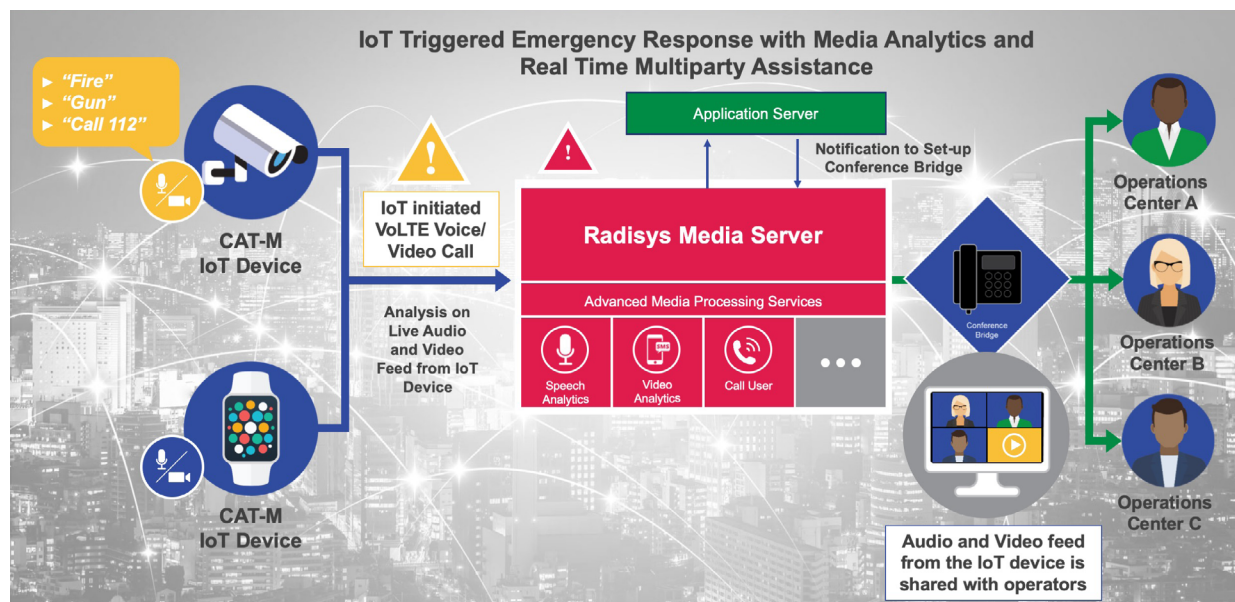


- Face Recognition
- Object Detection & Counting
- Image Recognition
- Motion Detection
- Intrusion Detection
- Loitering Detection
- Emotion Recognition
- Age & Gender Recognition
- Virtual Reality
- Augmented Reality
- and more ...

Example: Computer Vision Video Use Cases at a Train Station

## IoT Applications

IoT-enabled (CAT-M) cameras with both audio and video streaming capabilities send these video and voice streams to Radisy's Media Analytics platform, which processes the information in real time and creates actionable "events" based on visual cues such as "motion" or audio cues such as the word "fire."



Example: Enhanced Public Safety

## Security and Remote Monitoring Applications

Computer Vision is applicable to multiple security scenarios—everything from validating a user identity to enter a remote facility (e.g., using facial recognition in addition to a magnetic ID card to create multi-factor authentication) to adding an extra layer of security (and confidence) to consumer cash withdrawal transactions at an ATM machine by linking facial recognition to the ATM card and the PIN.

Computer Vision also provides a replacement for traditional closed-circuit TV monitoring, allowing motion detection for secure areas, remote areas, etc., to be coordinated with an alarm and escalation call as an alternative to having a person continually monitoring video screens.



Example: Remote Surveillance

## Data Gathering Applications

Computer Vision can support data gathering use cases. It can be used to count traffic (highways, intersections, mass transit, or foot traffic) and provide everything from just pure data gathering to notifications when threshold limits are exceeded. In retail, this data gathering supports analysis of consumer response to advertisements, displays, and more.

## Video Authentication for Commercial Transactions

Computer Vision supports commercial transaction use cases, such as providing a simple way to use license plate recognition for parking lot payment transactions. It identifies the plate number and enables it to be linked to the time of entry and departure.

## Advanced Speech Recognition Applications

Radisys' Media Analytics platform combines [the ability to process speech](#) ranging from a small vocabulary of keywords and commands to natural language interaction in the context of voice and video calls. The advanced media analytics capabilities can process these real-time audio streams and keyword detection to trigger an action such as listening for the word “fire” or to take an action such as enabling a command word to turn on or off an additional device.

# Summary

Computer Vision is a critical new tool for the real-time analysis of multi-media content streams, using Artificial Intelligence and Machine Learning-based analytics.

Radisys' Media Analytics solution adds Computer Vision capabilities that enable CSPs and SIs to quickly analyze media streams and take action to monetize real-time content. By taking an incremental approach to add these capabilities to the media processing already in their networks, rather than leveraging expensive external solutions, Radisys is enabling CSPs and SIs to cost-effectively scale to support a growing number of media streams and then use the analysis to generate new revenues.

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## Why Radisys

- Dual competence: 28+ years of experience + IT data center expertise
- Partner of choice for service provider central office migration to open compute/open source platform
- Industry best time to market in open data center turn up with field proven methods of operations and global staging centers
- Commitment to open source platforms: actively contributing open compute platform specification and software stack back to open source community
- Experience resources well versed in open source software development; multiple cloud infrastructure such as Openstack, Mirantis, Windriver; and traditional mobile and fixed networking skills
- Excellence in support services with global technical centers across the globe



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