



SERVING PUBLIC SAFETY WITH ARTIFICIAL INTELLIGENCE

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"Artificial Intelligence" was first coined by John McCarthy in 1956. An esteemed computer and cognitive scientist, McCarthy proposed that "all aspects of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." This proposal birthed the field and study of Artificial Intelligence and created new possibilities for technology and innovation.

What is Artificial Intelligence?

Artificial intelligence as defined by Merriam-Webster is "the capability of a machine to imitate intelligent human behavior." Simply put, machines can learn, just as humans do, with compounding knowledge to become increasingly more aware at a given task. Artificial Intelligence surrounds us in everyday life. From the smartphones in our pockets to the automatic doors at the grocery store, variations of A.I. have slowly emerged to make life easier.

Artificial Intelligence in Public Safety

Public safety personnel deal with an overwhelming number of challenges on a day-to-day basis. As staffing shortages increase, tasks such as record requests, document, and media editing (i.e., manual redaction and transcription), and patrolling of high value

assets are not feasible anymore. As innovations in the field of Artificial Intelligence continue to move forward, these gaps in staffing can be filled by computers and help to increase efficiency and safety.

Equature and Artificial Intelligence

Equature has recognized this gap in public safety and significantly invested in the development of artificial intelligence technologies and infrastructure for use in both real-time and retroactive Intelligent Video Analytics (IVA) and audio processing. These technologies were developed to fully leverage the latest hardware capabilities (ie. Body-worn cameras, security cameras), thus facilitating fast and accurate generation of useful analytic metrics across multiple, simultaneous streams. System architecture options range from near-edge embedded devices (Nvidia Jetson) to single, PC-based systems, to multi-PC server farms (Azure, AWS, private, etc.) allowing for significant scalability. With the use of this Artificial Intelligence model, public safety moves to become proactive through crime prevention/prediction and automated evidence processing.



Crime Prevention/Prediction

Current crime prevention measures include bright lights, locks, unbreakable glass and other fixtures, security fences, security personnel, video cameras, manually reporting to the police, and quick removal or fixing of the vandalism. Cities and municipalities pay millions of dollars each year to maintain these measures, clean up graffiti, repair buildings, and replace vandalized equipment. Annual damage costs in vandalism throughout the country are estimated to be in the billions of dollars.

Equature's A.I. detection and alerting application allows users to easily configure a system of one or more cameras to perform object detection and alerting to mitigate some of these costs. Any of the Equature object detection networks can be incorporated into the detection pipeline that monitors the video stream of each connected camera. As part of the configuration process, each camera can have defined cross lines of detection and/or "regions of interest" (ROI) that are monitored and will send alerts as detected objects either cross a cross line or enter an ROI. Alert triggering is highly configurable. Trip wires can be configured to alert for every object that crosses it, for every Nth object, or simply just to count without alerting. Similarly, ROIs can be configured to alert when there is a single object detected inside it, when there are N or more objects, or simply to count without alerting (Object Tracking).

Equature's weapons detection application separately detects handguns and long guns. There are challenges. Equature understands that identifying a weapon is difficult and preventing false positive identification is paramount. Detection is easily made when weapons are clearly brandished and weapon features are plainly visible; however, in situations when weapons are only partly visible, where other small objects may be in a person's hand, i.e., cell phone or wallet, a false positive identification may result. This is common among single-image weapons detection neural nets. Equature is working on novel techniques to reduce and eliminate false positive issues, improving the ability of agency to better leverage our unique approach within security solutions.

Automated Evidence Processing

Evidence processing is often a time-consuming and cumbersome task. Manually editing both video and audio can take personnel hours to complete, costing staff time and agency money. A 1-hour video can take up to 8 hours to manually redact. Many departments have dedicated positions specifically designed for managing evidence and other media.

Equature's automated redaction application is used to redact faces or full bodies from recorded video while reducing the time it takes to complete the redactions, thus saving staff time and agency money spent in

overtime costs. The process is simple and fast:

1. Submit video for automatic detection of faces or bodies
2. Examine detections and select which are to be redacted, or simply redact all faces.
3. Mark and track other non-face objects that need to be redacted. A common need is to obscure non-face object/features in a video (ie. Recognizable signs, tattoos, landscapes).

With Equature's "region of interest" configuration, redactions can be completed in real-time as an object or person enters the ROI.

Audio is transcribed simultaneously to mitigate hours of manual labor and allow for full text searching. Other capabilities include processing and editing of 9-1-1 calls, court documentation, and witness statements.

