HPE POINTNEXT SERVICES

Solution overview

VIDEO ANALYTICS FOR SAFETY

HPE Pointnext Services for solving safety challenges within population dense areas

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Options for video analytics solutions: Many organizations already have access to CCTV and security video feeds. The challenge is to interpret what cameras see and process many different inputs in the cases where multiple camera feeds are present. This is something best left to a computer and with the advancement of computer vision algorithms that allow:

- Object detection and classification—find people within the frame and count how many are within a specified zone
- Ability to triangulate positions—understand in three dimensional space, the location of the detected people
- Distance calculation between objects—understand the interaction of the crowd and where proximity might be a risk—in real time
- Thermal imaging—determine potential fever candidates who pose increased risk to the crowd

THE PROXIMITY CHALLENGE

There are many occasions where the gathering of individuals in a single space could be problematic. This could be related to security concerns, safety concerns, or health concerns. This can often involve using teams of people to patrol areas and make a judgement on whether there are too many people, or if it is too tightly packed. Of course, team members in charge of safety can be potentially at risk.

The alternative is to use close circuit television (CCTV), which is already commonly in use, to monitor the area and for the operator again to make judgement calls. This can involve many cameras and require the operator to flip between feeds in order to cover large venues or open spaces. This increases the risk of missing contact events and potential risky crowds accumulating.

Even if the video footage is archived, to get data on the movement of those people and the trend in density would require human reviewers.

DETECTING HEALTH RISK EVENTS

In many situations where public gathering is required and public health is a concern, there is often a risk of contamination or transmission of an infection from individual to individual. Advice in these situations is that the people should maintain a safe distance from each other. This can be challenging in confined spaces, so the use of personal protection equipment (PPE) is often mandated to reduce the risk.

The other means of reducing risk is to be able to quickly identify individuals that pose a greater risk to the group by demonstrating specific symptoms such as fever. The risk can be reduced if we can pick out those subjects from a crowd and manage appropriately.

As with the proximity challenge, the ability for human observers or camera operators to cover large areas in an efficient way, helping ensure equipment is properly used and identifying risks is limited, and a better way to maintaining safety is needed.

A SIMPLE PACKAGED SOLUTION TO SUPPORT THREE MAIN OUTCOMES

Experts from HPE Pointnext Services have architected a simple solution that allows the addition of the minimal amount of infrastructure and software, whilst leveraging cameras and equipment already deployed, in order to deliver all three use cases defined in Figure 1. It allows better use of video bandwidth and processing power to empower the safety team to monitor and secure environments for the benefit of their community.

Video analytics for social distancing	Video analytics for fever detection	Video analytics for PPE detection
• Leverage existing cameras or deploy new • Triangulate individuals' location in 3D space • Measure distance between individuals in the frame • Count people within a defined zone • Trigger events when distances or counts are breached • Store data for later trend analysis for future planning	• Leverage heat-sensitive cameras to determine hot spots within a crowd of people • Utilize machine-learning algorithms to determine heat is from a person, and not an object • Use advanced analytics to determine temperature difference versus the rest of the people, to remove environmental influence	• Leverage existing cameras or deploy new ones • Utilize facial identification to find individuals and their faces, arms, or torso in a frame • Use machine-learning algorithms to determine if a PPE is present • Deploy in locations where PPE such as masks are mandatory, including health centers, public transport hubs, and large venues

FIGURE 1. Video analytics for safety use cases

Our guiding principals

- The solution is for citizen well-being and it should not cause harm in their lives including their right to privacy.
- The solution is designed to capture only the data required to make a decision on proximity or well-being.
- At no point is an individual personally identifiable and to the model it is only considered an "object".
- No data is stored that could personally identify individuals.
- The data is transient and is only held for the milliseconds required to perform the inference before being discarded.

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BUILDING A TOTAL VIDEO ANALYTICS SOLUTION WITH HPE AND PARTNERS

Video analytics requires an edge-to-core approach. HPE Pointnext Services offers expertise around data, artificial intelligence (AI), security, and Internet of Things (IoT) for the deployment of video analytics solutions at the edge, data centers, and in cloud. When building such a solution (see Figure 2), you should consider cameras, sensors, controllers, and management systems, along with edge systems, data center assets, and enterprise storage. Appropriate network infrastructure is required as well. From compute systems at the core to Aruba network and video surveillance systems at the edge, the broad HPE portfolio of solutions delivers integrated, AI-powered video analytics. Our curated APIs and ISV applications help ensure performance, efficiency, and flexibility. Edge-to-core solutions are tested in global IoT and AI labs to facilitate compatibility and functionality.

Modular architecture

- Each component can be HPE IP or partner
- Inference engine architected to support multiple use cases
- Each service is independently scalable
- Optional training module for in-solution model refinement/new use case development
- Supported by technology options for high-speed data platform

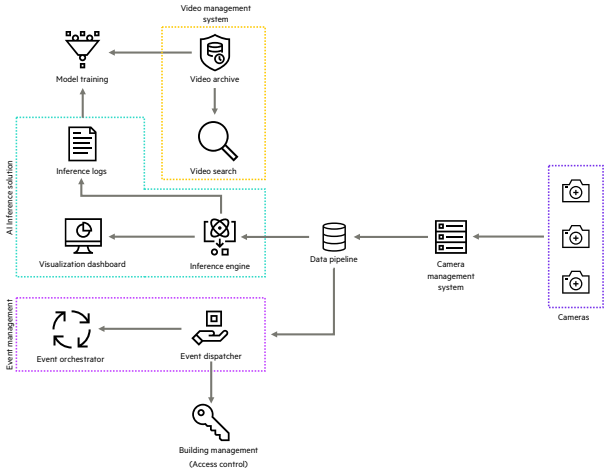

FIGURE 2. Example architecture supporting the use cases

SERVICES TO LEVERAGE FOR VIDEO ANALYTICS

Instead of building one-off pilots that don't move to production, we work closely with your teams to explore, experiment, and evolve your solution for your specific use cases. You can get started with the HPE AI Transformation Workshop and/or pilot your use case and evolve your solution. HPE's global presence and experience working with customers across industries, puts us in a unique position to address your specific needs and requirements. Combining this with our proven technology, our experience in deploying AI and IoT technologies, we can effectively address your environmental health, safety, and surveillance needs with AI-powered video analytics solutions.

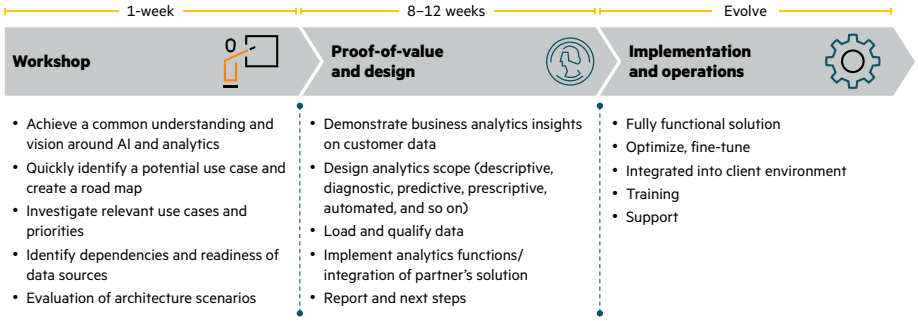

FIGURE 3. HPE Pointnext Services for video analytics

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a50001883ENW, June 2020