Leveraging Face Detection Technology to Enhance Security

Getting to Know Verint Video Face Finder Analytics

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Introducing Verint Video Face Finder Analytics

Face detection has become one of the most important technologies for identifying criminals in a crowd. The goal of face detection systems is to quickly find suspicious faces in populated environments, such as streets, stadiums, train platforms, airport terminals and other densely occupied areas. One of the most common uses of face detection systems today is the ability to highlight single image captures to help identify facial features. However, finding a solution that can account for a myriad of external influences – potential appearance variation, change in illumination, occlusions or camera angle – and can accurately extract face data from video feeds, is challenging.

By leveraging advanced technology, such as Verint® Video Face Finder Analytics™, organizations can more effectively locate suspects in a crowd and investigate suspicious activity.

Understanding the Challenges

Some face detection technologies can be extremely beneficial, while others may offer little to no value. Accommodating typical "free flow" human traffic using standard face detection technologies has limitations.

For example, the angle of the camera and the position of the face are very important to the success of the detection process. Many face detection technologies require that the person being detected look straight into the camera field-of-view in order for the camera to acquire a view of the subject's eyes. However, cameras need to detect people during their everyday activities — on the streets, during sports events, and more. Therefore, the risk of not catching the suspect in a front pose is quite high. Detection results may well be unreliable.

This image illustrates how the video camera captures and identifies faces in front of a building entrance.

For example, many standard face detection systems would be unable to accurately detect the faces of the people in the adjacent image for two reasons:

1. They require the camera to be installed at eye level and in front of the traffic. Normally, it is impossible to install the camera at such a low level because it may block the traffic; also, subjects vary in height. Even if a camera could be installed at face level, people in front would block the view of people at the back, and only a limited number of faces would be detected.
2. Standard face detection engines have difficulty detecting faces when people are looking sideways. The required face pose is not always obtainable in natural circumstances.

The Verint Solution

Verint Face Finder Analytics overcomes the challenges faced by previous face detection solutions. Designed to run on video streams from cameras installed above walking gates, doors, and passages such as stadium entrances or airport passages, Verint Face Finder Analytics typically captures more than 95 percent of faces in a crowd and saves high-quality images in a searchable database. The successful capture rate depends on camera position, congestion and light conditions.

Images captured by Verint Face Finder Analytics can be used by an operator or investigator to scan and find relevant suspects. Normally, the human eye can review a few faces per second and filter-in/out other known image features of a suspect, such as glasses, a hat or a cap, shirt color and more. The process of identifying a suspect can become faster and more reliable if Verint Face Finder Analytics is used. For example, what if an investigator needed to find a suspect out of the approximate 1,000 people who entered a train station in the last 24 hours? Using Face Finder Analytics, the process may take the investigator only a few minutes, as compared to the significant amount of time required for the investigator to review the last 24 hours of a recorded video.

The database of collected face images can be used for:

1. Retroactive face **searching** (time, specific camera, specific area, etc.)
2. **Finding** a suspect by scanning all faces
3. **Confirming** the suspect by viewing the relevant video stream
4. **Reporting** the suspect

In contrast to traditional face detection systems that require high-resolution cameras to identify a person and strong CPU power for detection, Verint's Face Finder Analytics can work with low-resolution images and much less CPU power.

Solutions in Action: Train Passenger Robbery

In the case of a robbery, the first action is to look for a known suspect (in this case, a brown haired young male wearing a cap and a green shirt that entered the station 30 minutes before the attack). Performing full video scanning on relevant transit stations could take days, if not weeks.

Verint Video Face Finder Analytics can help organizations reduce the time that would be required to find the suspect:

- **Search** – Conduct on-site search for suspect and retrieve faces using a known time frame (30 minutes before the attack) from relevant transit stations cameras.
- **Find** – Scan the face album to find the young male that entered one of the stations wearing a cap and a green shirt.
- **Confirm** – Click a suspect image to retrieve the original video of the suspect and verify the suspect's behavior and the suspect's interactions with potential accomplices.
- **Report** –
    - Add the suspect(s) to the reference list
    - Manage the case in the Verint investigation management system
    - Export the relevant video for further investigation

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