

At a Glance

What is it?

■ TAVI is a software product that leverages commercial video cameras to perform automated threat detection and face recognition for urban warfare environments.

How does it work?

■ TAVI leverages video analytics and biometrics to provide a software solution to perform threat detection, automated identification of subjects, and higher level situational awareness. It can perform autonomous intelligence gathering from video.

What will it accomplish?

■ TAVI can be used to support pedestrian or vehicle checkpoints, to augment local area force protection, or to do target identification for long range chokepoints. It can be used for access control with overt camera hardware, or it can be used covertly for long term intelligence or evidence gathering. TAVI provides a never-tiring eye that can be used for a variety of security or intelligence-gathering requirements.

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The Tactical Analysis of Video Imagery (TAVI) system provides video analytics and remote face recognition from unattended video surveillance. TAVI detects user-defined security threats, identifies the perpetrators and identifies their associates.

The system monitors the entire scene to look for user-defined security threats, such as the violation of a secured perimeter, entry into a secured area, or other suspicious activity. Once a threat event has been detected, the system tasks one or more pan-tilt-zoom cameras to track the subject and zoom on the subject's face. Face detection is performed on every frame, and the highest quality frames are submitted against a face recognition database for identification of the subject.

Multiple pan-tilt-zoom cameras can track multiple people simultaneously. Alternately, if there is only one person in the field of view, all cameras can simultaneously track this single target to optimize the chances that a facial shot suitable for face recognition can be obtained. TAVI can also use a single, multi-megapixel camera for doing long distance face recognition of choke points, such as doorways or narrow corridors.

TAVI also detects rendezvous events between two individuals, either when two people meet each other, or when two people are seen walking through the scene together. These data are analyzed using a technique called social network analysis, which takes pair-wise interactions between people and constructs a social network as well as statistics indicating the roles individuals play in the network. This technique has been used for analyzing email or financial transactions for many years, but this is the first time the technique has been applied to data derived from surveillance video

Research Challenges and Opportunities:

- *Face recognition in realistic outdoor environments, with bright lighting, stark shadows, and uncooperative subjects*
- *Subject tracking and identification in crowded or complicated scenes with lots of background activity*
- *Segmentation of threatening activities and individuals of interest from background civilian activities*