

Intrusion Detection and Cooperative Tracking Using PTZ Network Thermal Imagers

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Nowadays more and more network thermal imaging cameras are working over distributed networks, offering the capability of online remote intelligent video surveillance. In this paper, we propose an original intrusion detection and cooperative tracking approach applied for PTZ (Pan/Tilt/Zoom) network thermal imagers. The key module in the proposed approach is real-time FOV (Field-of-View) matching. It is realized in a parallel way. One thread tracks the keypoints employing our ultra-low-weight keypoint description and hybrid SP-Tree, and the other thread handles the three-dimensional mapping task. In the intrusion detection module, after eliminating the offset between current frame and prior frame through FOV matching, it handles the intrusion detection by motion detection in the pre-set surveillance zone. In the cooperative tracking module, it shifts the priority of tracking by imager pose estimation, which is also based on FOV matching, avoiding transferring the local features from one imager to another. Experiments are conducted to demonstrate that the proposed approach is of high accuracy for intrusion detection and cooperative tracking, while keeping the frame rate over 20fps.