Deep learning for multi-sensor perimeter intrusion detection systems.

Siqura B.V. is located in Gouda and provides advanced video surveillance solutions. These solutions include IP cameras, video encoders, network video recorders, fiber equipment, video management and video analysis software. Siqura has developed an video-based perimeter intrusion detection algorithm to protect areas where maximum security is required. For difficult scenarios, we have developed an event-based automatic tuning algorithm which can adjust the parameters of the last detection stage to decide whether an detected object would be of interest to the security operator (e.g. a person would be of interest in contrast to falling leaves). It enables the security operator to increase the detection performance by a few event annotations, but also enables the algorithm developers (us) to quickly evaluate the performance of a new algorithm.

However, there a re a number of situations where the above-mentioned learning procedure does not perform as well and we need to optimize parameters in an earlier stage of the detection. An example is the removal of headlights, which need to be removed at a region-level. Another example is a perimeter protected by a mix of visual and acoustic sensors, and the optimal decision when one sensor generates an alarm, while another sensor does not detect anything. In both cases, parameters in multiple stages of the algorithm can be optimized simultaneously to improve the detection performance of the whole system.

Goals

- Create a training procedure which can automatically adjust parameters at all stages of the detection algorithm in order to increase the overall detection performance.

Tasks

- Record "intrusion events" with visible-light and thermal cameras extended by other sensors such as radar, laser scanners or microphones.
- Implement the training procedure to simultaneously optimize parameters at several stages of the algorithm.
- Invent a general description of a sensor (group) which allows substitution by another sensor and to find a new weighting of the parameters to increase performance in the detection system.

Keywords and -technologies

- Computer vision, pattern recognition and machine learning.

Contact information

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