

People Detection and Tracking in Infrared Image Sequences

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Introduction

- Night vision surveillance
 - Human targets are crucial information for the safety of soldiers to operate in night vision
 - Two night vision sensors: infrared sensor and intensified imager
 - Infrared sensors can easily detect humans targets and other warm objects
- Advantages of infrared-image-based human target detection
 - Humans will be brighter than the background
 - The brightness of different humans is similar in spite of different color and textures of their clothing
- Disadvantages of infrared-image-based human target detection
 - Humans are not the only hot objects
 - The intensity values of the whole human body are not uniform



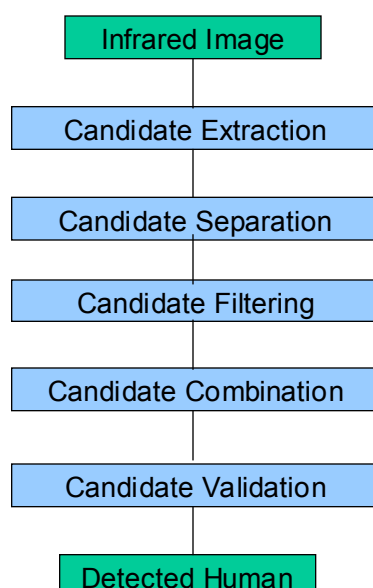
(a) Intensified image

(b) Infrared image

Figure 1. Sensor images for night vision surveillance

Algorithm Description

- Algorithm for people detection



- Algorithm for people tracking
 - Kernel-based tracking algorithm is applied
 - It is robust and has low computational complexity
- Interleaving of the detection and the tracking stages
 - Tracking takes less time than detection but only tracks the already-found targets
 - Detection provides information on new targets

Experimental Results

- Human target detection

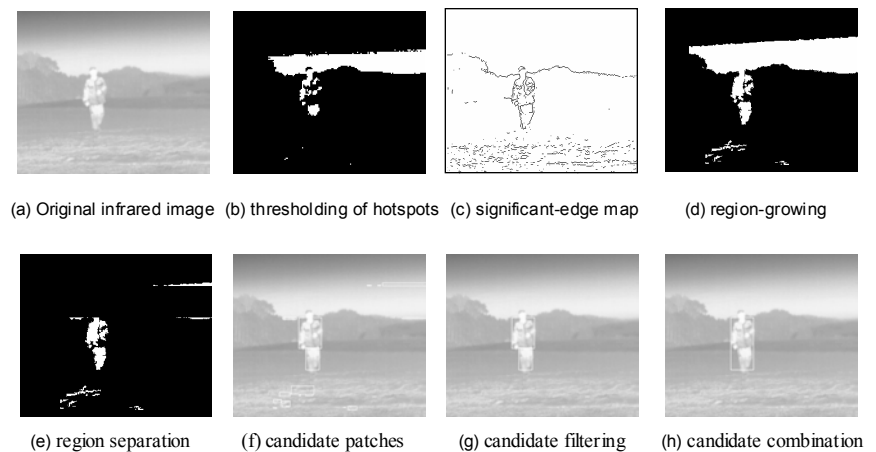


Figure 2. Results for human target detection - 1

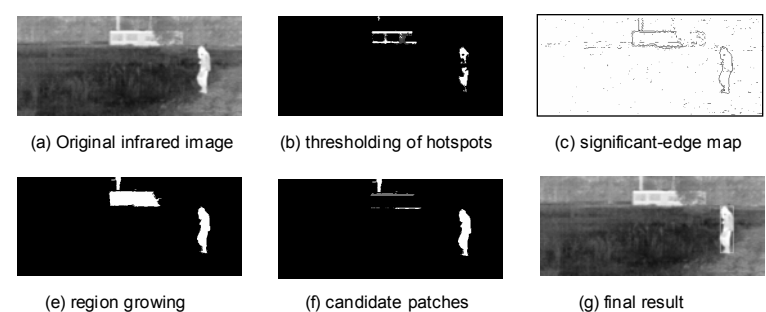


Figure 3. Results for human target detection - 2

- Human target tracking

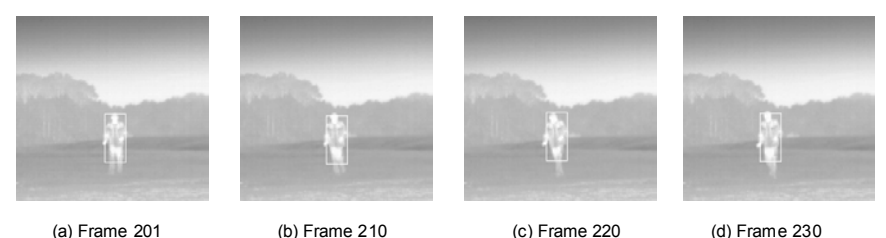


Figure 4. Results for human target tracking