Application of LABVIEW and MATLAB software products for infrared objects detections

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Abstract: - Objects detection in thermal or infrared images is an actual problem in wide range of applications like medicine, biology, security etc. Application of software products can facilitate the process of objects detection in thermal or infrared images. The goal of this article is to examine LABVIEW and MATLAB software products application for objects detection in thermal images.

Key-Words: thermal images; infrared images; MATLAB; LABVIEW

1 Introduction
Infrared technology is a modern and advanced method to detect and analyze scenes or objects normally hidden from the human eye. With thermograpic cameras we detect radiation range of the electromagnetic spectrum. Humans and other warm animals become easily visible against the environment, day or night because of increasing of radiation emitted by an object with temperature enhance. One allows to detect variations in temperature and consequently to detect cold objects against warm humans. The produced images of radiation mast to be processed with order to detect and separate the objects. The algorithms for object detection in thermal images are based on the general methods for image segmentation [1] and objects separation [2]. In this article are used some of the basic principles in image processing for objects and people detection in thermal images with software products LABVIEW and MATLAB.

2 Application of MATLAB software product for object detection and objects separation in thermal images

The MATLAB software product is suitable for image processing. In this paragraph is shown that MATLAB’s functions based on the general methods for image processing and objects separation are suitable for object detection in thermal images.

Figure 1 depicts an infrared image. For one processing with MATLAB’s functions is applied.

With MATLAB function rgb2gray(.) the image is transformed to gray image (Figure 2).

The histogram for this gray image is seen from Figure 3.
On the base of the histogram a label threshold is calculated and then objects separation is made (Figure 4).

The second infrared image is depicted to Figure 5.

The second image for that processing with MATLAB’s functions is applied.

The image is transformed to gray image (Figure 6).

On the base of the histogram for this image a label threshold is calculated and then objects separation is made (Figure 7).

The third infrared image is depicted to Figure 8.

The image is transformed to gray image (Figure 9).

The histogram for this gray image is seen from Figure 10.
On the base of the histogram a label threshold is calculated and then object separation is made (Figure 11).

The fourth infrared image is depicted to Figure 12.

The image is transformed to gray image (Figure 13).

The histogram for this gray image is seen from Figure 14.

On the base of the histogram a label threshold is calculated and then object separation is made (Figure 15).

The fifth infrared image is depicted to Figure 16.

The image is transformed to gray image (Figure 17).

The histogram for this gray image is seen from Figure 18.

On the base of the histogram a label threshold is calculated and then objects separation is made (Figure 19).
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It can be made LABVIEW model for object detection and objects separation in thermal images (Figure 20).

The front panel for the processing is given from figure 21 to figure 25.

For more precision in image processing in addition it can be applied neural network. One can be implemented on LABVIEW too [3].

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References