

# Defining the Boundaries of Structural Texture Region in the Space of Transform with Distributional Scaling Functions

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**Abstract** - In this paper the method for determination of the structural texture region boundaries is proposed.

**Keywords** – Distribution Scaling Function, Structure Texture Image, Underlining Transform.

## I. INTRODUCTION

At the processing of radar images, air photos of agricultural cultures, and also at inspection of fabrics quality the segmentation of structure texture images is used [1]. The problem of detection of the boundaries of texture region with the known parameters on a homogeneous background is decided with the method in the Gilbert transform domain [2]. This method differs by high robustness as a result of underlining of boundaries of every texel of structure texture and subsequent detection of texel groups [2]. As texel groups is detected by comparison with good examples in Gilbert transform domain the method is time consuming.

As an alternative the differential methods which differ with a low level of calculation are used for image segmentation of structure texture. The basic stages of differential methods are underlining transform (UT), thresholding and morphological processing. For elaboration of differential method of selection of the boundaries of texture region on a homogeneous background it is necessary to underline of the boundaries of texture region as group of objects (texels). A similar problem decides by the distribution scaling (wavelet-) function with a compact support [3].

## II. PROPOSED METHOD

The proposed method includes in the following blocks:

- in a 1st block it is assumed that as a result of choice of type of UT a transform with the distribution scaling (wavelet-) function with a compact support is preferred, and the parameter of UT is determined from a priori information about an image;
- in the 2nd block for the result of UT with the distribution scaling (wavelet-) function with a compact support the estimation of segmentation feature, transform this feature to intensity and underlining of resulted image edges is used;
- in the 3rd block of processing the boundaries of texture region on the initial image are determined as the points of extremes of resulted image after transform with the distribution scale (wavelet-) function;

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- in the 4th block the image pixels is labeled by thresholding; the threshold is chosen from a priori information about minimum amplitude of detected signal;

- in the 5th block the morphological processing of binary image which resulted after the previous block of processing is used .

Taking into account the result of labeling of image pixels the morphological processing of the resulted binary image consists in the following. For the improvement of quality of boundary of region of structural texture the previously unconnected pixels is bridged. Then the structural texture region was painted by a white color. For this purpose for every line (column) of binary image we set all pixels which are previous to boundary of texture region to 0.

To the pixels after the element of boundary of texture region to the next element of boundary texture region is assigned to 1. Then to all pixels following to the element of boundary of texture region a value 0 is assigned. As a result of such processing a white area on a binary image corresponds to the structural texture region on an initial image. However after such processing the resulted white area on a binary image contains also small dark areas.

For the deleting of these small dark areas the filtering of connected pixels groups is used. More detailed the regions of dark pixels are selected and the area of each these regions is calculated. If area of some the region exceed some threshold then this region painted with a white color. Then after filtering of connected pixels groups the boundaries of structural texture region is detected by the method for binary image segmentation.

## III. CONCLUSION

The robustness of the proposed method is comparable with the method of Gilbert transform domain. In respect of segmentation quality the proposed method exceeds a base method to 4 times. The processing time for the proposed method is in 11 — 20 times low then for based method.

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