

# ALGORITHMS OF IMAGE PROCESSING BASED ON GAUSSIAN AND LAPLACIAN PYRAMIDS

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The rapid development of sensor technologies has given impetus to the widespread use of multisensory systems in computer vision applications, remote monitoring of objects, as well as for medical and military purposes. The result of using multisensory systems has been a rapid increase in the amount of information to be processed and stored. To provide an effective method of reducing data flow, algorithms for combining images are developed that ensure the preservation of useful information obtained from the source images [1].

An algorithm for the significance map synthesis based on the analysis of low-level image properties (intensity, color, orientation), the formation of a Gaussian pyramidal structure, the calculation of characteristic maps and visibility maps by intensity, color and orientation, and the calculation of the resulting significance map of the original image is developed. It is shown that the multisensory image representation as a pyramidal structure is effective for detecting low-contrast objects.

An algorithm for image enhancement based on combining source images using the Laplacian pyramid is proposed. The developed algorithm is efficient for use in both single-sensor and multi-sensor systems.

The simulation of the algorithms was performed in Matlab programming environment. It was found that the best results for significance map synthesis could be achieved for Laplacian pyramid. For image enhancement algorithm, the smallest standard error is ensured by using a three-level pyramidal structure.

## References

1. Gonzalez R., Woods R. Digital Image Processing: International Edition. Pearson Education, 2011. – 976 p.