The combined use of structural analysis and Hausdorff metrics in comparison of an object to a sample

R.V. Khmelev[1,2]
[1]*Image Processing Systems Institute of RAS*
[2]*Samara State Aerospace University (SSAU)*

Abstract:

The paper presents a modification of the basic algorithm for comparing contour images according to the Hausdorff metric, which takes into account the direction of traversal and allows binding the boundary points of one set only with the boundary points of another set that are close in the direction of traversal. A diagram of the application of the Hausdorff metric in structural analysis is also presented.

Keywords: Hausdorff metrics, images, boundary points, structural analys.

Acknowledgments: This work was supported by the Russian-American program "Basic Research and Higher Education" (BRHE), grants of the President of Russia No. NSh-1007.2003.01 and the Russian Foundation for Basic Research No. 04-07-96500.

Citation: Khmelev RV.The combined use of structural analysis and Hausdorff metrics in comparison of an object to a sample. Computer Optics 2005; 27: 174-176.

Access full text (in Russian)

References:

[1] Huttenlocher DP, Klauderman GA, Ruckligde WJ. Comparing images using the Hausdorff distance. IEEE Trans Pattern Anal Mach Intell 1993; 15(9): 850-863. DOI: 10.1109/34.232073.

[2] Kazanskiy NL, Khmelev RV. Comparison of an object and asample for the deviation of the contours [In Russian]. Computer Optics 2000; 20: 134-139.

[3] Mauch S. A fast algorithm for computing the closest point and distance transform. 2000. Source: http://www-cgrl.cs.mcgill.ca/~godfried/teaching/cgprojects /98/normand/main.html.

[4] Felzenszwalb PF, Huttenlocher DP. Distance transforms of sampled functions. Cornell computing and information science Technical Report TR2004-1963 2004.

[5] Kazanskiy NL, Myasnikov VV, Khmelev RV. Algorithms for calculating distances to object pixels in binary images [In Russian]. Computer Optics 2000; 20: 128-133.

[6] Volotovsky SV, Kazanskiy NL, Popov SB, Khmelev RV. Vision system for the recognition of numbers of rail wagons using a modified correlation function in the Hausdorff metric. Computer Optics 2005; 27: 177-184.