IMAGE ANALYSIS BASED ON OBJECT BOUNDARY CHARACTERISTICS

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The comparison and classification of images can be carried out by means of numerous methods. In this study we develop the approach based on object boundary curve analysis.

In general, object boundaries can be extracted from the image in two following ways:

1) Segmentation followed by the extraction of segmented areas boundaries. In this case each object in a scene can be represented by a single closed contour. Usually such contours have not branches and can be represented by piecewise smooth curves. For description of such objects we propose to use curvature as significantly invariant curve characteristic: curvature is invariant to affine transforms and the proportional scaling leads only to its linear change.

2) The detection of the object boundary by means of segmentation is not always possible (for example, for objects with strongly nonuniform brightness characteristics). Nevertheless, object boundary still can be quite distinct even if segmentation fails, and it is possible to extract it using an edge detector of some kind. Such an approach yields a boundary consisting of disconnected branching curves with self-intersections. In our study we try to generalize curvature-based approach for such arbitrary edges.

The proposed approach had been used for image comparison and classification. In the study we empirically reveal specific object categories on which our methods work well.

The connection between the mentioned approach with the methods of morphological analysis of *Yu.P. Pyt'ev* [1] is also discussed in this work.

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References

1. *Yu.P. Pyt'ev., A.I. Chulichkov.* Morphological methods of image analysis. –M.: FIZMATLIT, 2009 (in Russian).