Cascaded KNN-BPN for Classification of Ears based on Shape Measures for Person Identification

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Abstract

In this paper, a method to recognize persons using ear biometrics has been proposed. The recognition is through classification of Ears rendered conjointly by KNN and back propagation neural network. For this purpose, features of the Ear signifying its shape have been considered. To avail these features from 604 ear images, they were considered to be planar surfaces. Planar surface properties like the distribution of area, moment of inertia (MI) with respect to longest axis and MI with respect to an axis orthogonal to long axis and respective radii of gyration have been considered. KNN assisted BPN was able to categorize the ears into three distinct groups. The classification based person identification system showed an average recognition accuracy of 90%. The other metrics like entropy, purity, precession, recall and f-measure showed a comparatively high value which is suggestive of adequate performance.

References

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Index Terms

Computer Science         Artificial Intelligence

Keywords

BPN, Moment of Inertia, Radii of Gyration, Major Axis, Minor Axis, k-Means Clustering