

Content-based image retrieval for fish based on extended zernike moments-local directional pattern-hue color space

ABSTRACT

Scholars have been fascinated in the areas of the description and representation of fish species images so the Content-based Image Retrieval is adopted. Proposals have been made to use various techniques like the fusion of Zernike Moments (ZM) and Local Directional Pattern (LDP) to obtain good image representation and description results for feature extraction. To elaborate, ZM is characteristically rotation invariant and it is very robust in the extraction of the global shape feature and the LDP serves as the texture and local shape feature extractors. Nevertheless, extant studies on ZM-LDP fusion are only adopted for gray-level. The role of color is substantial for the fish. The proposal is that the ZM-LDP method is improved so that it can bring out the color features for the fishdomain effectively. By computing the LDP on the Hue plane of the HSV color space of the image, the color information is obtained. Improved ZM-LDP fusion to be able to obtain color information (Extended Zernike Moments-Local Directional Pattern-Hue Color Space) is experimented on Fish4Knowledge (natural image) dataset consists of 27370 images and able to achieve Mean Average Precision of 77.62%. Based on the experimental results, it is shown that the proposed method has successfully achieved higher accuracy compared to other comparable methods. A statistical comparison based on the Twotailed paired t-test was carried out and has proven that the retrieval performance of the proposed method is improved.

Keyword: Zernike moment; Local directional pattern; Fish; Content-based image retrieval; Color feature