

Melanoma Skin Cancer Segmentation using Robust Multi-View Fuzzy C- Means Algorithm

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Abstract: Skin cancer has become a significant issue and the primary cause of death for people all over the world. Melanoma is one of the most serious types of skin cancer since it can spread to any area of the body. So, the prognosis of melanoma in its early stages is very important for figuring out how likely it is that the patient will get better. Because of this, clinical imaging science is a very important part of finding certain types of skin lesions quickly and correctly. In this study, we showed a new way to use digital image processing to separate skin lesions in dermoscopic images. First, the image is preprocessed with a median filter to eliminate extra hair, noise, and artefacts in order to create a better image for segmentation. To improve the accuracy of dermoscopic images, the preprocessed images are segmented based on an innovative method built on an improved robust Multiview Fuzzy C-Means clustering algorithm (RMV-FCM). Following segmentation, features are extracted using the ABCD rule to produce optimal features that may be used as input for classification. Lastly, the Support Vector Machine (SVM), K-Nearest Neighbors (KNN), Random Forest (RF), and Nave Bayes classifiers use machine learning techniques to characterize skin lesions as malignant and benign (NB). The RMV-FCM algorithm exhibits more adaptability and higher clustering performance when compared to a variety of related clustering techniques. In terms of detection accuracy, as noted in the conclusion of this research, the novelty of the work shows that RMV-FCM is exceptional in comparison to numerous related clustering algorithms, and SVM is exceptional in comparison to other standard classifiers. The simulated outcome indicates that the suggested strategy accurately diagnoses skin tumors with a 97.5% accuracy rate. The results of the suggested segmentation are extremely accurate when compared to other algorithms in the same domain.

Keywords: RMV-FCM, ABCD, SVM, and skin cancer

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