

Defense Announcement

Asymmetry Measures for Automated Melanoma Detection in Dermoscopic Images

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Dermoscopic imaging is used by physicians in an attempt identify malignant melanoma while at an early stage by looking for particular markers. Dermoscopic rules such as the ABCD rule, Menzies rule, and the seven-point checklist provide a means of scoring lesions based on the presence of these markers, with the score indicating the probability of malignancy. In previous work, our lab has developed automated recognition systems based on these rules and incorporated them into an application for the iPhone called DermoScreen. This work focuses on improving DermoScreen through new methods of recognizing lesion asymmetry, one of the primary indicators of melanoma. The methods were tested against a standard database of dermoscopic images of benign and malignant lesions. The results showed that the new methods provided better matching with ground truth asymmetry values.

Decision fusion strategies were investigated to combine the results from the dermoscopic rules implemented in DermoScreen. Utilizing the proposed asymmetry methods, the fusion of the dermoscopic rules provided overall diagnostic accuracy on the test set of 95%.