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Evaluating Intelligent Methods for Decision Making Support in Dermoscopy Based on Information Gain and Ensemble

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Abstract

Melanoma, the most dangerous skin cancer, is sometimes associated with a nevus, a relatively common skin lesion. To find early melanoma, nevus, and other lesions, dermoscopy is often used. In this context, intelligent methods have been applied in dermoscopic images to support decision making. A typical computer-aided diagnosis method comprises three steps: (1) extraction of features that describe image properties, (2) selection of important features previously extracted, (3) classification of images based on the selected features. In this work, traditional data mining approaches underexploited in dermoscopy were applied: information gain for feature selection and an ensemble classification method based on gradient boosting. The former technique ranks image features according to data entropy, while the latter combines the outputs of single classifiers to predict the image class. After evaluating these approaches in a public dataset, we can observe that the results obtained are competitive with the state-of-the-art. Moreover, the presented approach allows a reduction of the total number of features and types of features to produce similar classification scores.

Keywords

[Machine learning](#) **[Computer-aided diagnosis](#)** **[Image analysis](#)**

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