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Convolutional Neural Network Approach to Classify Skin Lesions Using Reflectance Confocal Microscopy.

Wodzinski M, Skalski A, Witkowski A, Pellacani G, Ludzik J. *Conf Proc IEEE Eng Med Biol Soc. 2019 Jul;2019:4754-4757. doi: 10.1109/EMBC.2019.8856731.*

ABSTRACT

We propose an approach based on a convolutional neural network to classify skin lesions using the reflectance confocal microscopy (RCM) mosaics. Skin cancers are the most common type of cancers and a correct, early diagnosis significantly lowers both morbidity and mortality. RCM is an in-vivo non-invasive screening tool that produces virtual biopsies of skin lesions but its proficient and safe use requires hard to obtain expertise. Therefore, it may be useful to have an additional tool to aid diagnosis. The proposed network is based on the ResNet architecture. The dataset consists of 429 RCM mosaics and is divided into 3 classes: melanoma, basal cell carcinoma, and benign naevi with the ground-truth confirmed by a histopathological examination. The test set classification accuracy was 87%, higher than the accuracy achieved by medical, confocal users. The results show that the proposed classification system can be a useful tool to aid in early, noninvasive melanoma detection.

PMID: 31946924 DOI: 10.1109/EMBC.2019.8856731