Early Skin Cancer Detection Using Macroscopic Images and Convolutional Neural Networks

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The purpose of this experiment was to see if convolutional neural networks can accurately predict whether a macroscopic image has skin cancer in it or not. Steps taken for the completion of this project are: Obtain a data set of images of both melanoma lesions and non-Melanoma lesions in early stages zero to two, create a testing set and a training set from this data. Build a convolutional neural network to take the images as input. Train and validate the convolutional neural network on the testing set and training set respectively. The images used to train and test the model were obtained from a local dermatologist. Images must first undergo pre-processing which involves color normalization and augmentation. After that images were randomly separated a training set and a testing set where the testing set is 20% of the images and the training set is 80%. After much configuration of the convolutional neural network, or model, the model can consistently achieve 88-90% accuracy and 0.86-0.92 receiver operating characteristic area under the curve score. These results correctly proved my hypothesis.

Awards Won: