Melanoma Classifier

Oliver Toole - toolebox@stanford.edu
Dave Dolben - ddolben@stanford.edu

Melanoma is the most serious type of skin cancer; however, early detection and removal can lead to a greater chance of successful treatment. The goal of our project is to take an image of a potential melanoma, and calculate the risk that it is cancerous. The specific goal of classifying melanoma is difficult for several reasons. The first is that only subtle differences exist between completely harmless common moles, and deadly melanoma. Both are roughly the same size, with similar color. In our project, we will harness the power of image processing algorithms to analyze the subtle differences between these two conditions to provide a prediction, and provide information regarding our classification confidence.

We will look at several key features of melanoma. The first is its irregular borders. Because it has fairly well defined edges, we should be able to use Otsu’s method to binarize the image, and then use erosion to find the edges. From there, we can compute a histogram of distances from the centroid. Based on this histogram, we will be able to detect the irregularity of the boarders, as well as the eccentricity of the shape, both telling features of melanoma. Other metrics will be color variation. Once a binarized image is calculated, we can threshold the color image and look at the spatial color variation. Based on these and other features, we hope to train a svm to do the classification.
References:

http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=312091&isnumber=7570


