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AAD 2017 abstract (200 words).
TITLE: Content Based Image Retrieval of Dermoscopy Images Using Deep Learning
Alternative: Content Based Image Retrieval using Deep Learning as a Decision Support Tool for Dermoscopy

Co-Authors (In-Order): Jordan Yap, Majid Razmara, Maryam Sadeghi, Stella Atkins

Objective 1: Create a system to perform query-by-example image retrieval to aid doctors in diagnosing skin lesion images
Objective 2: To evaluate the system's performance on retrieving visually similar skin lesion images

Study type:
- Basic Science
- Procedural Dermatology

Content based image retrieval (CBIR) is useful in medical applications to support physicians' decision making on suspicious cases by displaying visually similar images. We have built a CBIR tool that when given a dermoscopy image as a query, finds similar images from a database containing thousands of previously validated images. This tool can also be useful for non-expert physicians, medical students and researchers.

We use a deep neural network trained for segmenting skin lesions to extract image features for our CBIR system. We find that using the image features from the neural network to generate a candidate set of similar images gives superior performance over using standard image colour histograms and texture descriptors. Our CBIR system performance is further improved by refining the images in the candidate set using features calculated from only the predicted lesion region which excludes normal skin. Performance is evaluated qualitatively by an expert dermatologist to determine the relevance of the retrieved image's size, colour, shape and texture to the query image. Quantitatively we evaluate our method on a dataset with 6036 benign or malignant skin-lesion images. In the top 15 most similar images retrieved, 71.2% are of the same class as the query image.

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