DermaTech: A Novel, Non-Invasive Technology To Detect Skin Cancer

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Skin cancer is the most common cancer worldwide, with 2 people dying of skin cancer every hour in the United States alone (Skin Cancer Foundation, 2022). However, if detected early (before the cancer reaches the lymph nodes), the death rate drops dramatically, with the 5-year survival rate being about 99%. Many rural or low-income communities lack healthcare facilities, increasing the risk of skin cancer going undetected. By developing an online application that can accurately detect the main types of skin cancer, people without access to the proper healthcare resources will be able to easily identify potential tumors with their own device, such as a phone with a camera. DermaTech is the first non-invasive, online tool to be able to detect all 7 of the main types of skin lesions (Melanocytic Nevus, Melanoma, Benign Keratosis, Basal Cell Carcinoma, Actinic Keratosis, Dermatofibroma, and Vascular lesions) that uses the MobileNet AI model, a new type of streamlined, highly accurate computer-vision model. To make an accurate image-recognition model that would be able to distinguish between the specific types of cancerous, precancerous, and benign lesions, 3 different artificial intelligence models were built and tested for the highest ROC AUC score: K-Nearest Neighbors (KNN), Convolutional Neural Network (CNN), and MobileNet. The model with the highest predictive accuracy was the MobileNet model, with a ROC AUC score of 0.9228, as opposed to the average 0.866 to 0.889 score for expert dermatologists (ScienceDaily, 2018)

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