**LITERATURE SURVEY**

**1) Performance of Multi-Layer Perceptron and Deep Neural Networks in Skin Cancer Classification**

**AUTHORS:**  Y Jusman

Skin cancer refers to a condition where there exists abnormal growth of skin cells, mostly occurs on skin exposed to the sun. There are several types of skin cancer, where the most common types include basal cell carcinoma, squamous cell carcinoma, and melanoma. Without proper treatment, skin cancer, particularly in the melanoma form, can lead to deaths. Fortunately, early detection and classification of skin cancer are highly effective in preventing serious damages from skin cancer. In this paper, we train Multi-layer Perceptron, a custom convolutional neural network, and VGG-16 for skin cancer classification on a large skin cancer dataset, HAM10000. The performance of each trained model is subsequently compared and analyzed in terms of classification accuracy and computational time. Our experimental setups reveal that the VGG-16 model can set the best classification accuracy among the compared networks while in terms of testing time, the VGG-16 and custom CNN models are being much faster than the Multi-layer Perceptron. The results of our study are beneficial in providing systematic comparison and analysis of several neural networks in skin cancer classification.

**2) Skin Cancer Classification using CNN**

**AUTHORS:** R Raja Subramanian

There is a necessary need for early detection of skin cancer and can prevent further spread in some cases of skin cancers, such as melanoma and focal cell carcinoma. Anyhow there are several factors that have bad impacts on the detection accuracy. In Recent times, the use of image processing and machine vision in the field of healthcare and medical applications is increasing at a greater phase. In this paper, we are using the Convolution neural networks to detect and classify the class of cancer based on historical data of clinical images using CNN.Some of our objectives through this research are ,to build a CNN model to detect skin cancer with an accuracy of >80% ,to keep the false negativity rate in the prediction to below 10%, to reach the precision of above 80% and do visualization on our Data. Simulation results show that the proposed method has superiority towards the other compared methods.

**3) Skin Cancer Classification using Transfer Learning**

**AUTHORS:** Harikrishna

Today, Cancer is one of the major lethal diseases in the world. Globally out of every three cancers diagnosed, one is identified as skin cancer. Some reports suggest that one out of every five Americans might fall prey to skin cancer in the course of their life. Early detection of the disease plays a pivotal role in the treatment of skin cancer. Though these skin lesions can be seen without the help of any external clinical device, it is a challenging task to distinguish between malignant and benign skin lesions as they are alike in their physical appearances. This leads to an increased number of unnecessary biopsies where in one study it was revealed that nearly 5,00,000 biopsies are done in children every year to diagnose a mere 400 melanomas. To tackle this problem and help dermatologists in the diagnosis process, we developed an enhanced image classification model which can act as a preliminary check before moving to a costlier biopsy. This model can identify 7 distinct types of skin lesions. An analysis has been carried out on the HAM10000 dataset. We used transfer learning utilizing multiple pre-trained models, combined with class-weighted loss and data augmentation techniques for the classification process. Experimental analysis shows that the modified ResNet50 model is capable of identifying skin lesion images into one of the seven classes with categorical accuracy, weighted average precision, and recall of 90 percent, 0.89, 0.90, respectively. Our model can be used as a clinical decision support system to help dermatologists in the diagnosis process.

**4) Skin Cancer Based on VGG19 and Transfer Learning**

**AUTHORS:** Nourabuared

Skin cancer is a concerning health issue with yearly increasing numbers. Detecting and classifying cancer type is problematic, especially since patients have to undergo several diagnosis over lengthy periods of time, which hinders early treatment and survival chances. With the aid of digital image processing, features can be extracted to identify skin cancer and its different types. Convolutional Neural Networks (CNNs) recently emerged as powerful autonomous feature extractors, and they have high potential to achieve high accuracy with skin cancer diagnosis. In this paper, two cancer types in addition to one non-cancer type taken from Human Against Machine (HAM10000) dataset are classified using CNN model based on VGG 19 and Transfer Learning technique. The training strategy is explained, tested, and evaluated by calculating the network's overall accuracy and loss.

**5) A Modifier Inception\_v4 for imbalanced skin Cancer Classification**

**AUTHORS:** Emara

Deep learning architectures, especially deep convolutional neural networks (CNN) achieve high accuracy on object classification and localization tasks. Achieving such high accuracy requires powerful devices. In this paper, rather than an ensemble of multiple complex models, a single Inception-v4 model is adapted to classify extracted from the HAM10000 dataset. The proposed model is enhanced by employing feature reuse using long residual connection in which the features extracted from earlier layers are concatenated with the high-level layers to increase the model classification performance. The dataset used in this study is imbalanced; therefore, a data sampling approach is used to mitigate the data imbalance effect. The proposed architecture achieves an accuracy of 94.7% using the provided test set at the official benchmark for the International Skin Imaging Collaboration (ISIC) 2018.