Literature Review
Team 43
Phase 1 project

Research Article Title	Automatic skin disease diagnosis using deep learning from clinical image and patient information
Authors	K. A. Muhaba,K. Dese,T. M. Aga,F. T. Zewdu,G. L. Simegn
Published Date	25 November 2021
Problem Addressed / Identified	The most prevalent diagnosis approach for illnesses is visual assessment in conjunction with clinical information. Manual skin disease diagnosis takes time, requires skill and great visual acuity, and is prone to error.
Aim & Objectives	A deep learning pre-trained mobilenet-v2 model is provided for the automated diagnosis of five common skin diseases using data from clinical photos and patient information.
Model / Algorithm Used	Mobilenet-v2
Results	Using the suggested technique, a multiclass classification accuracy of 97.5%, sensitivity of 97.7%, and precision of 97.7% has been attained for the common five skin diseases.
Reference	https://onlinelibrary.wiley.com/doi/full/10.1002/ski2.81

Research Article Title	A Method Of Skin Disease Detection Using Image Processing And Machine Learning
Authors	Nawal Soliman ALKolifi ALEnezi
Published Date	2019
Problem Addressed / Identified	The advancement of lasers and Photonics based medical technology has made it possible to diagnose the skin diseases much more quickly and accurately. But the cost of such diagnosis is still limited and very expensive.
Aim & Objectives	Proposed an image processing-based approach to diagnose the skin diseases. This method takes the digital image of disease effect skin area then use image analysis to identify the type of disease.
Model / Algorithm Used	AlexNet (CNN)
Results	Initially, the input images are preprocessed, then features are extracted using pretrained CNN. Finally, classification is performed using SVM classifier. The system was tested on six types of skin diseases with accuracy of 95%.
Reference	https://www.sciencedirect.com/science/article/pii/S1877050919321295

Research Article Title	Segmentation and Classification of Skin Lesions for Disease Diagnosis
Authors	R.Sumithra MahamadSuhil D.S.Guru
Published Date	2015
Problem Addressed / Identified	Visual evaluation in concert with clinical data is the most common method of sickness diagnosis. Manual skin disease diagnosis is labour-intensive, error-prone, and demands considerable skill and visual acuity.
Aim & Objectives	A novel approach for automatic segmentation and classification of skin lesions using SVM and k-NN classifiers is proposed.
Model / Algorithm Used	SVM and k-NN classifiers
Results	A dataset of 726 samples from 141 photos representing 5 different types of diseases is used to assess the system's performance. The results are highly encouraging, with F measures of 46.71% and 34% for SVM and k-NN classifiers, respectively, and 61% for SVM and k-NN classifier fusion.
Reference	https://www.sciencedirect.com/science/article/pii/S1877050915003269

Research Article Title	Multiclass skin cancer classification using EfficientNets – a first step towards preventing skin cancer
Authors	KararAliac, Zaffar Ahmed Shaikha, Abdullah AyubKhan, Asif Ali Laghari
Published Date	December 6, 2021
Problem Addressed / Identified	The dermatologist's experience limits the visual examination of dermatoscopic pictures. Due to the subjectivity of human decision-making, alongside high inter-class similarity in skin lesions and other complicating factors, this method is prone to mistakes. To better mimic and maybe exceed medical experts, an automated computer system must engage in vast amounts of visual exploration utilising historical data.
Aim & Objectives	To examine the EfficientNets B0-B7's classification abilities using the HAM10000 dataset of dermatoscopic pictures. 10015 photos from seven different skin cancer classes—akiec, bcc, bkl, df, mel, nv, and vasc—make up the dataset.
Model / Algorithm Used	EfficientNets B0-B7
Results	By performing transfer-learning on the pre-trained weights of ImageNet and adjusting the Convolutional Neural Networks, they trained the EfficientNets B0-B7 on the HAM10000 dataset. They assessed the performance of all EfficientNet variations on this unbalanced multiclass classification issue using metrics such as Precision, Recall, Accuracy, F1 Score, and Confusion Matrices in order to examine the effects of transfer learning and fine-tuning. For each of the eight models, the study displays the per-class classification scores as Confusion Matrices. Our most reliable model, EfficientNet B4, in particular, achieved an 87 percent F1 Score and an 87.91 percent Top-1 Accuracy.
Reference	https://www.sciencedirect.com/science/article/pii/S2772528621000340

Research Article Title	Assisted deep learning framework for multi-class skin lesion classification considering a binary classification support
Authors	Balazs Harangi Agnes Baran, AndrasHajdu
Published Date	26 June, 2020
Problem Addressed / Identified	Skin cancer is a frequent and locally damaging type of malignant development. It comes from the cells that are arranged in a row along the membrane that divides the outermost layer of skin from the deeper layers. Because pigmented lesions are found on the skin's surface, a clinical professional can visually check one to identify malignant behaviour (such as melanoma) early. However, the majority of the time it goes unnoticed, which has serious health consequences.
Aim & Objectives	In this paper they proposed a CNN architecture, which is simultaneously trained to solve a binary and a multi-class classification problem, where the two classes of the binary task represent the benign/malignant classes of the original 7-class skin lesion classification problem.
Model / Algorithm Used	GoogLeNet Inception-v3
Results	They have simultaneously trained the identical CNN architecture (GoogleNet Inception-v3) for a binary and multi-class challenge by merging their softmax outputs on a support training layer and multiplying the multi-class confidences with the corresponding binary ones. By doing this, They have significantly improved a 7-class classification issue with regard to skin lesions. When the classes cannot be combined directly into fewer classes, Their method has a natural constraint. However, by using a non-supervised technique like k-means clustering, this problem can be solved.
Reference	https://www.sciencedirect.com/science/article/pii/S174680942030197X