Using Machine Learning To Diagnose Pneumonia and Skin Cancer: DoctorNet

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The purpose of this project is to develop a model to assist with the early diagnosis of pneumonia and skin cancer, using machine learning. This model will distinguish and identify infected organs from the rest and assist doctors in diagnosing patients that have these conditions. To develop the machine learning model or Convolutional Neural Network(CNN) Tensorflow and Keras frameworks were used, the algorithm was trained using two datasets which were combined, the datasets combined are pneumonia data (positive, negative) and skin cancer (benign, malignant). The machine learning model consists of 11 hidden layers, with 4 layers being that of convolution, another 4 that of max pooling, 1 flattening layer and 2 Dense or fully connected layers. The dataset for pneumonia is for paediatrics patients. The dataset for both pneumonia and skin cancer were acquired at Kaggle, a platform where they host machine learning competitions for machine learning engineers to develop solutions. The machine learning model achieved an accuracy and fl score of 85% on the data tested. This is without any fine-tuning and/or hyperparameter tuning, which is known as tuning or searching best parameters for the model, this is without transferring from pre-trained models as well. This is a convolutional neural network developed from scratch. The engineering goals were reached as the model can classify if an individual is infected with one of the diseases with an accuracy of 85%This is important because it means accurate and faster diagnosis. The f1 score as well, which is calculated using precision and recall is very good since it surpassed 80%.

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