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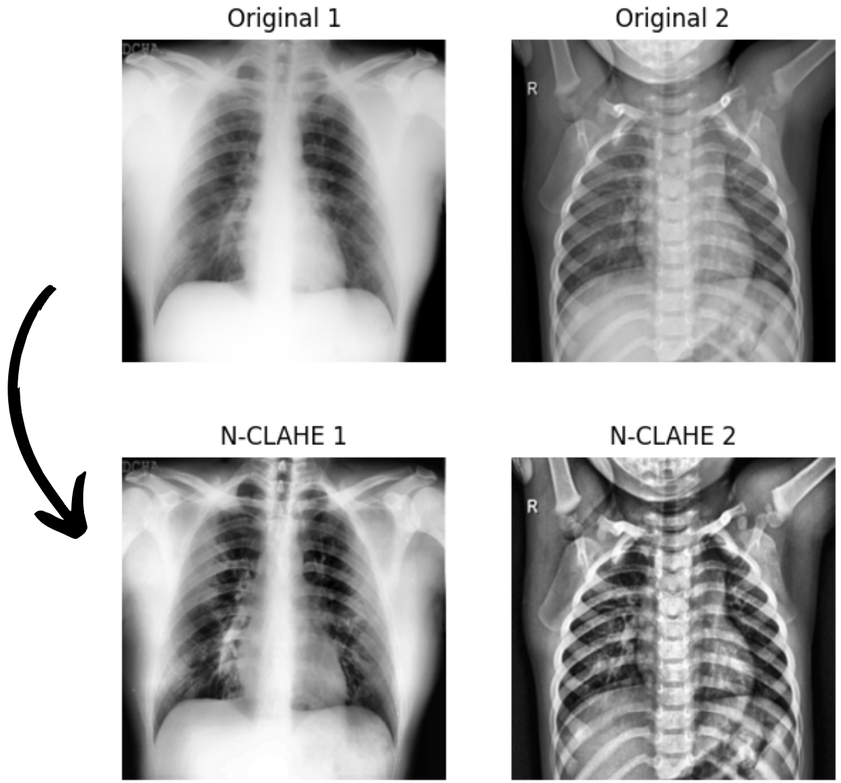
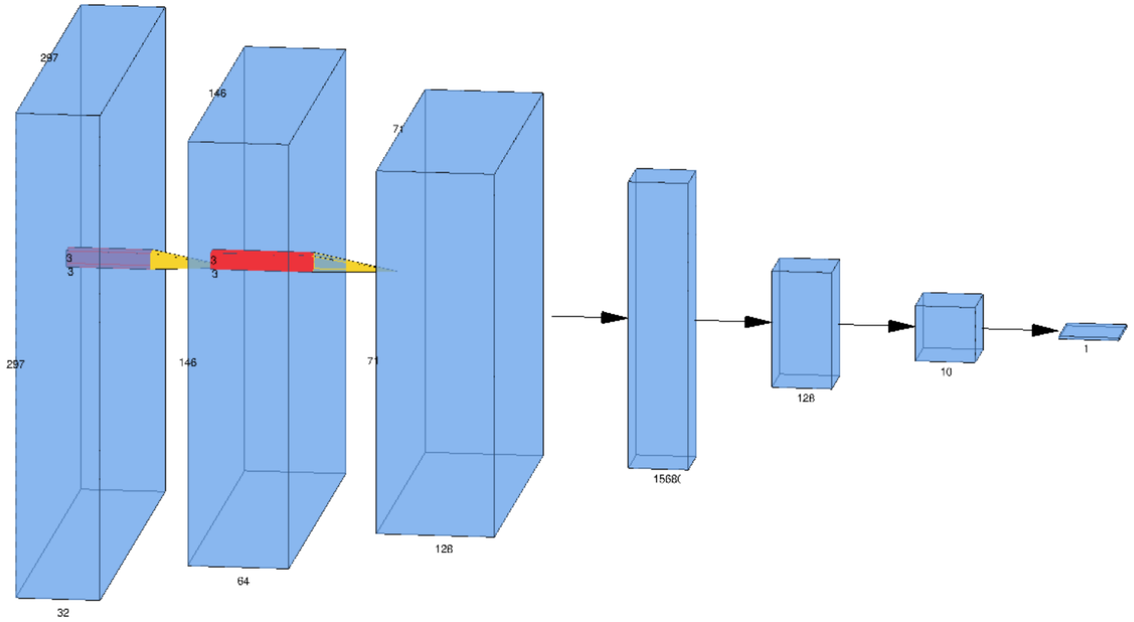
Shallow CNN & N-CLAHE

on COVID-19 Detection from CXR Images





C32-M | C64-M | C128-M | D128-D10-D1

Design Steps

1. Try to find best fit CNN blocks. --> C(x)M|C(2x)M|...
2. Tune the hyperparamters with Hyperopt.

TABLE II
THE TRAILS OF HYPERPARAMETERS FOR TUNING THE ARCHITECTURE

Hyperparameter	Tested Values	The Best
Dropout Rate	[0.0 0.1, 0.2, 0.3, 0.4, 0.5]	0.1
Model Depth	[2, 3]	3
Starting Filter Size	[16, 32, 64]	32
1st Dense Layer Size	[32, 64, 128]	128
Increasing Kernel	[True, False]	False
Starting Kernel Size	[3, 5]	3

2. Train the model with larger dataset and check the loss differences.

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Model: "sequential"
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 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 297, 297, 32)      896

 max_pooling2d (MaxPooling2D  (None, 148, 148, 32)     0
 )

 dropout (Dropout)           (None, 148, 148, 32)      0

 conv2d_1 (Conv2D)           (None, 146, 146, 64)      18496

 max_pooling2d_1 (MaxPooling  (None, 73, 73, 64)       0
 2D)

 dropout_1 (Dropout)         (None, 73, 73, 64)        0

 conv2d_2 (Conv2D)           (None, 71, 71, 128)       73856

 max_pooling2d_2 (MaxPooling  (None, 35, 35, 128)      0
 2D)

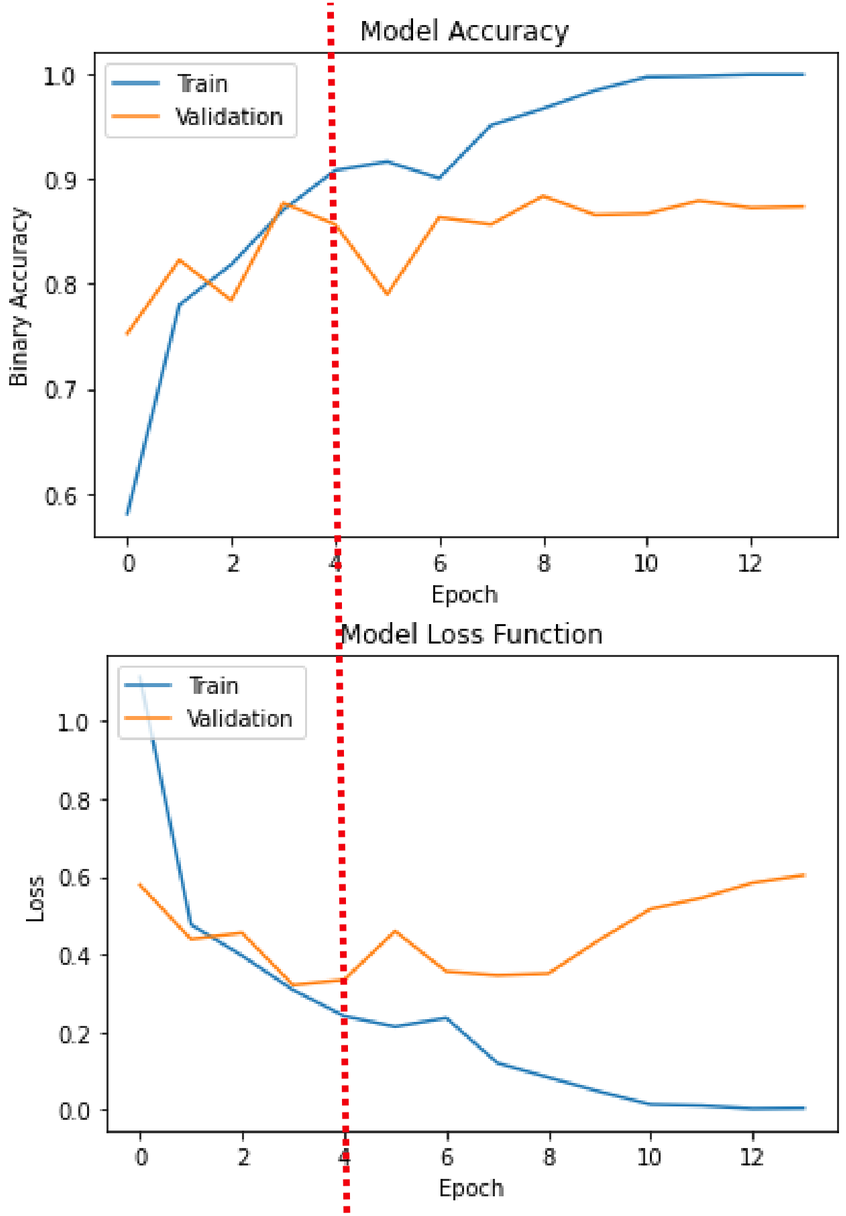
 flatten (Flatten)           (None, 156800)            0

 dense (Dense)               (None, 128)               20070528

 dense_1 (Dense)             (None, 10)                1290

 dense_2 (Dense)             (None, 1)                 11

=================================================================
Total params: 20,165,077
Trainable params: 20,165,077
Non-trainable params: 0
```



Train Results
loss: 0.3082
accuracy: 0.8703

Validation Results
loss: 0.3209
accuracy: 0.8768