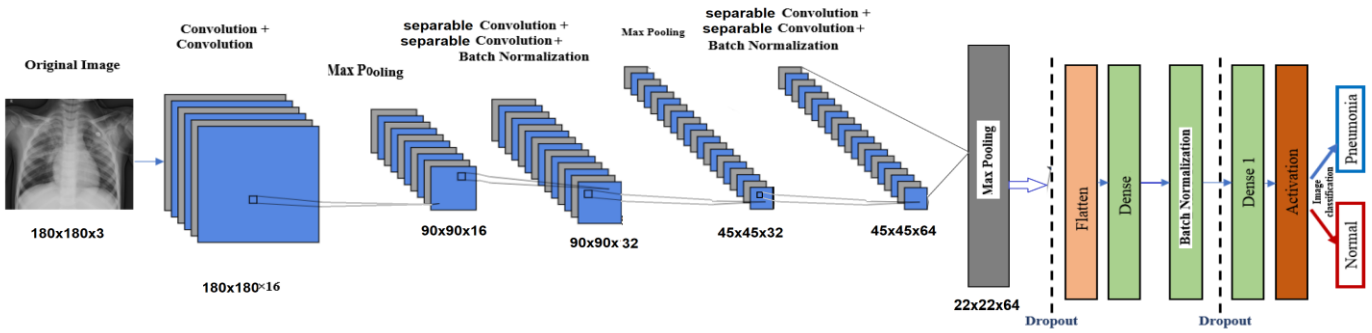
Design Report

- CNN layers and input and output size and shape:

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 180, 180, 16)	160
conv2d_1 (Conv2D)	(None, 180, 180, 16)	2320
max_pooling2d (MaxPooling2D)	(None, 90, 90, 16)	0
separable_conv2d	(None, 90, 90, 32)	688
separable_conv2d_1	(None, 90, 90, 32)	1344
batch normalization	(None, 90, 90, 32)	128
max_pooling2d_1	(None, 45, 45, 32)	0
separable_conv2d_2	(None, 45, 45, 64)	2400
separable_conv2d_3	(None, 45, 45, 64)	4736
batch_normalization_1	(None, 45, 45, 64)	256
max_pooling2d_2	(None, 22, 22, 64)	0
dropout (Dropout)	(None, 22, 22, 64)	0
flatten (Flatten)	(None, 30976)	0
dense (Dense)	(None, 64)	1982528
batch_normalization_2	(Batch (None, 64)	256
dropout_2 (Dropout)	(None, 64)	0
dense_1 (Dense)	(None, 1)	65

- **Design your implemented NN:**



- **activation functions used in model:**

1- **ReLU:** used in hidden layer of CNN the formula is deceptively simple: $max(0,z)$max(0,z). Used to introduce non-Linearity. And ReLU does a great job in introducing the same. Three reasons I choose ReLU as an Activation Function. First, it's Non-Linear (although it's acts like a linear function for x > 0) ReLU is cheap to compute. Since it's simple math, model takes less time to run

2- **sigmoid:** used in output layer of CNN used because it exists between (0 to 1). Therefore, it is especially used for models where we have to predict the probability as an output. Since probability of anything exists only between the range of 0 and 1, sigmoid is the right choice.

- **Dropout layer usage:**

It is used to prevent the network from overfitting. In this layer, some fraction of units in the network is dropped in training such that the model is trained on all the units.

A series of convolution and pooling layers are used for feature extraction. After that, we construct densely connected layers to perform classification based on these features.

Design Report

- Dataset link:

https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia.

NOTS:

Every member of our team will send the video from own email.

- **Team Members data:**

Member name	Member ID
يحيي نبيل محمد السيد محمد	20191480676
نور الدين ايمن احمد عبد التواب حسن	20191613726
محمود محمد شعبان عبد الطويل	20191480223
مصطفي محمود عمران محمود	20191613724
محمد عاصم فاروق عبد النبي	20191613926
احمد صلاح ابو الفضل ابو العلا	20191613603