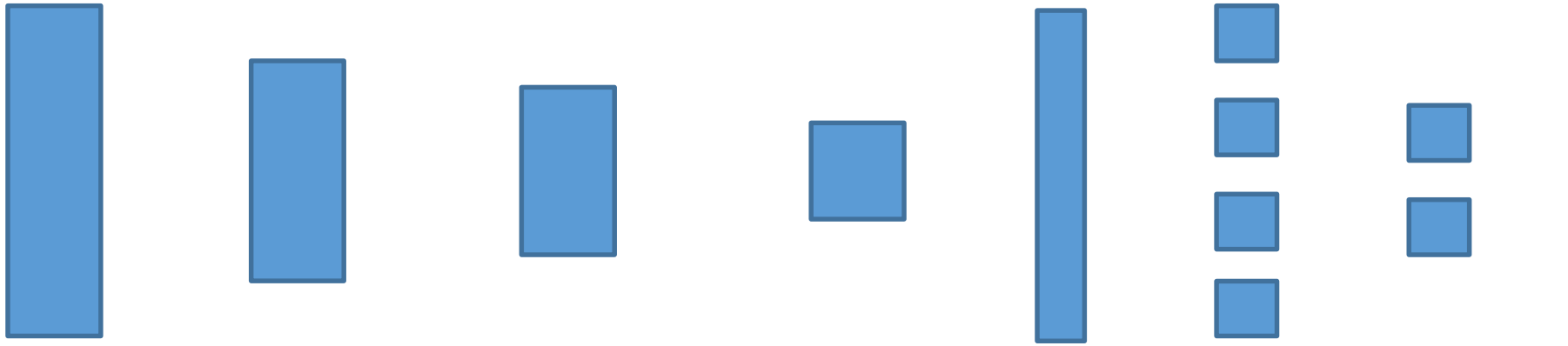
CS725 Project

- Pneumonia Classification using CNN
- All hyperparameter tuning results are included in this document

CNN - Epochs



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

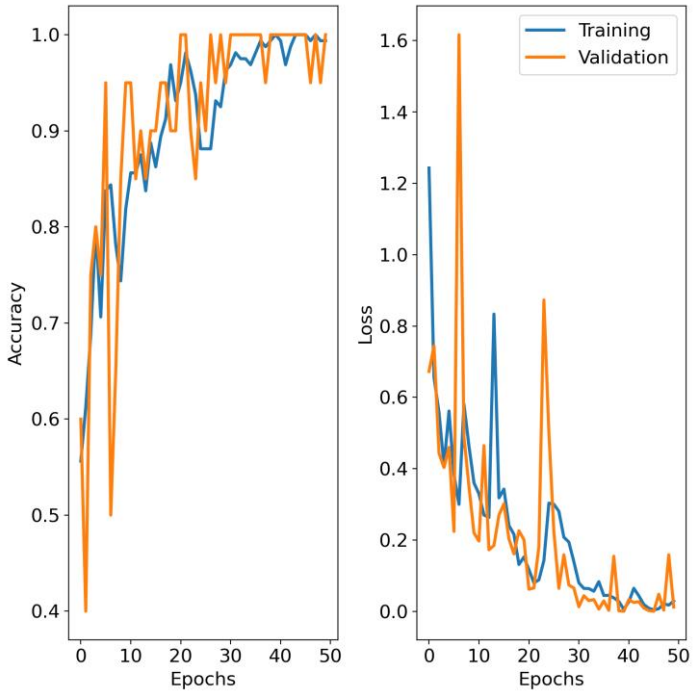
Pool size : 2
strides : 2

Flatten

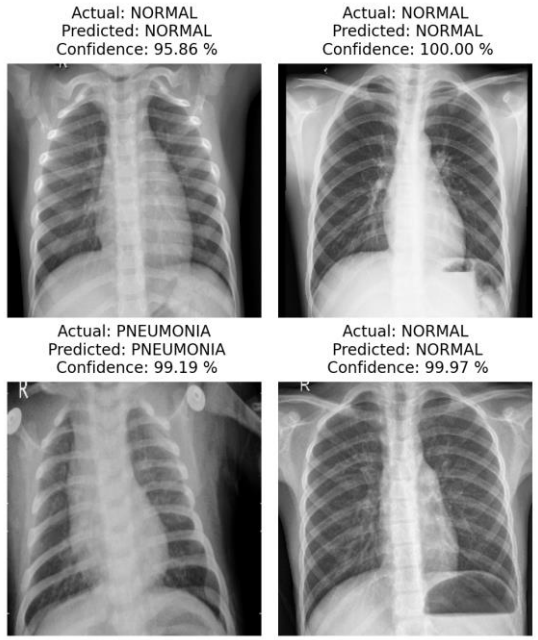
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

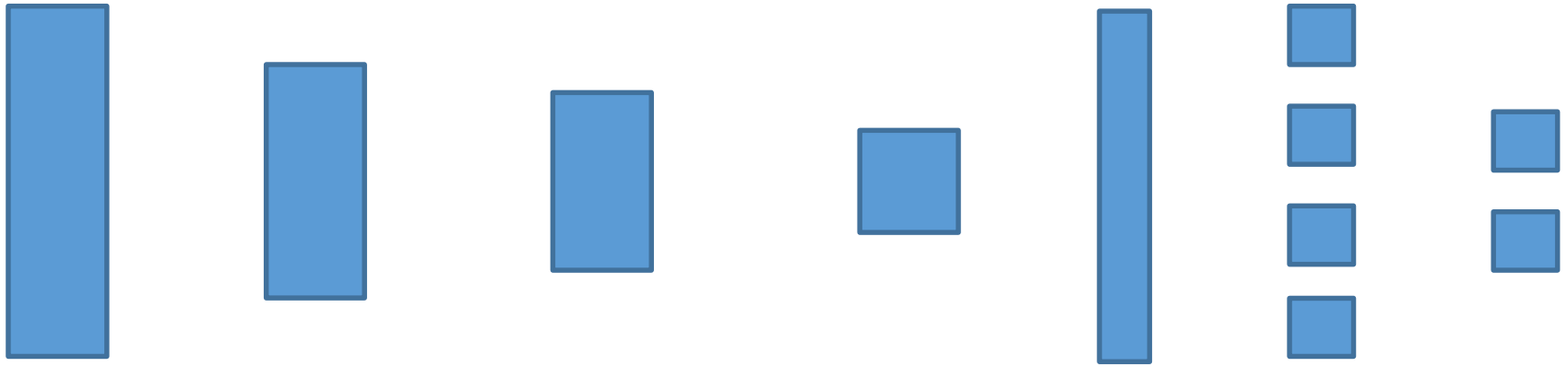
Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 100.00 %



CNN - Epochs



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

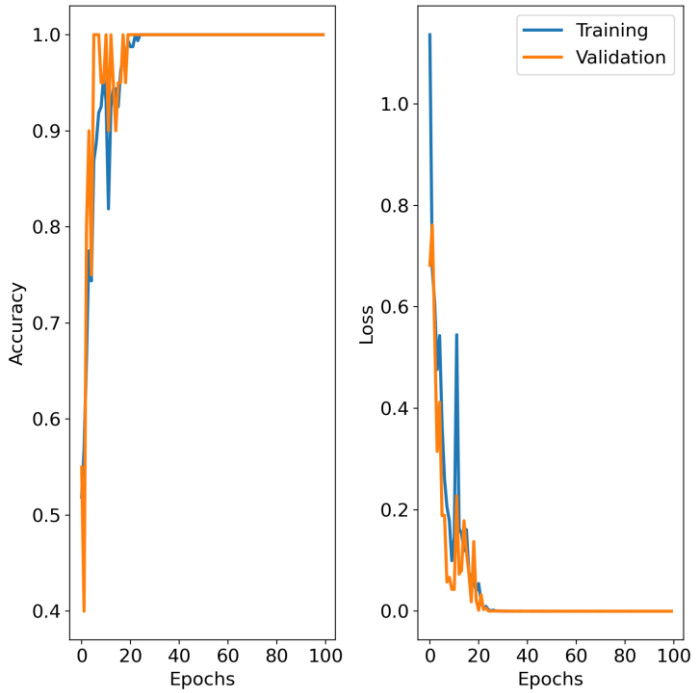
Pool size : 2
strides : 2

Flatten

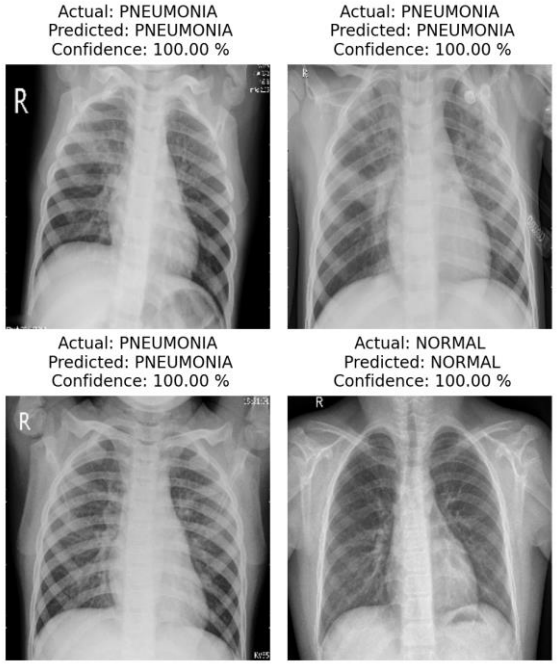
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

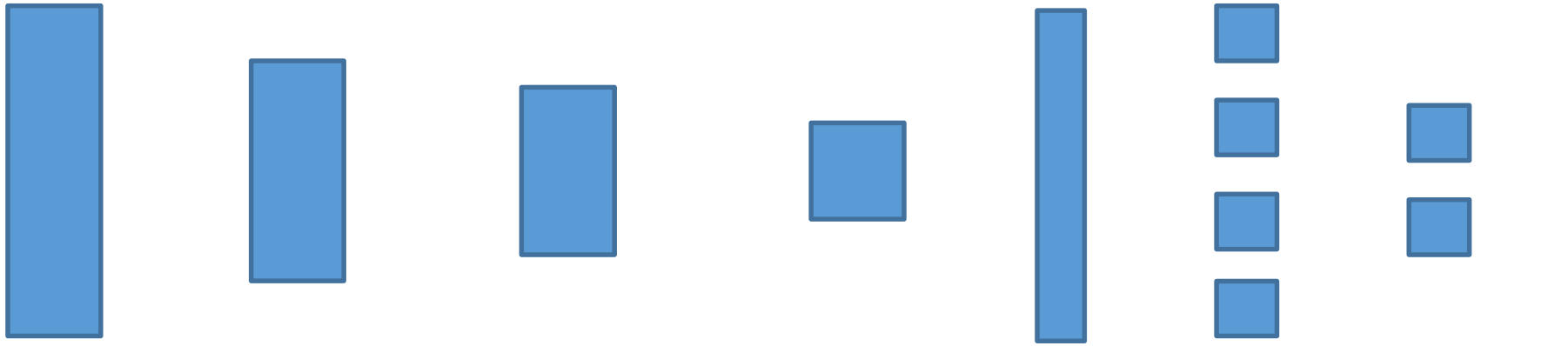
Epochs : 100
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 100.00 %



CNN - Learning Rate



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

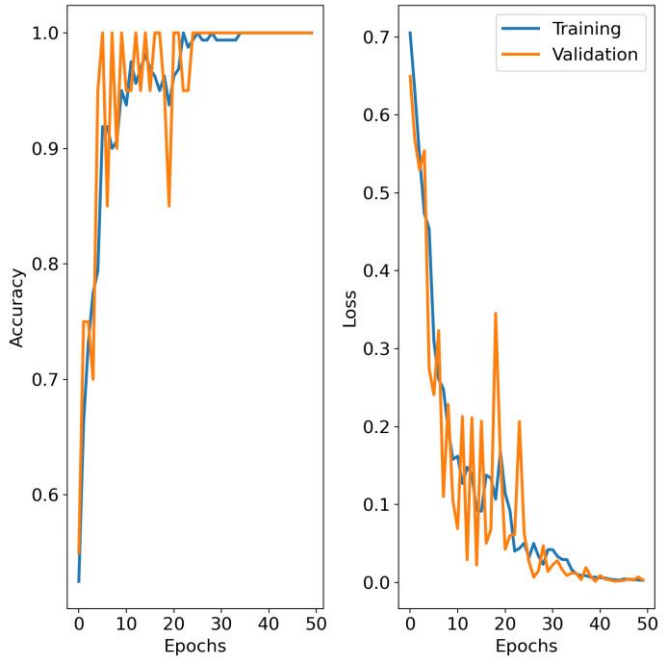
Pool size : 2
strides : 2

Flatten

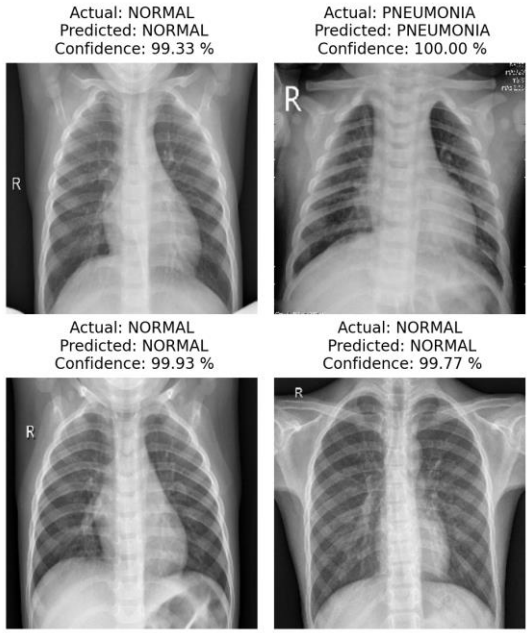
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

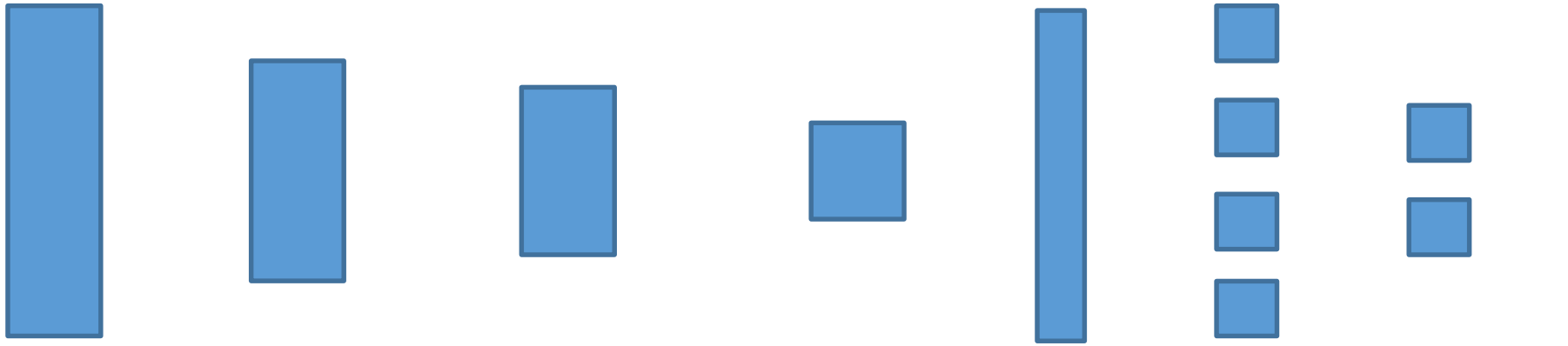
Epochs : 50
Learning Rate : 0.001
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 100.00 %



CNN - Learning Rate



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

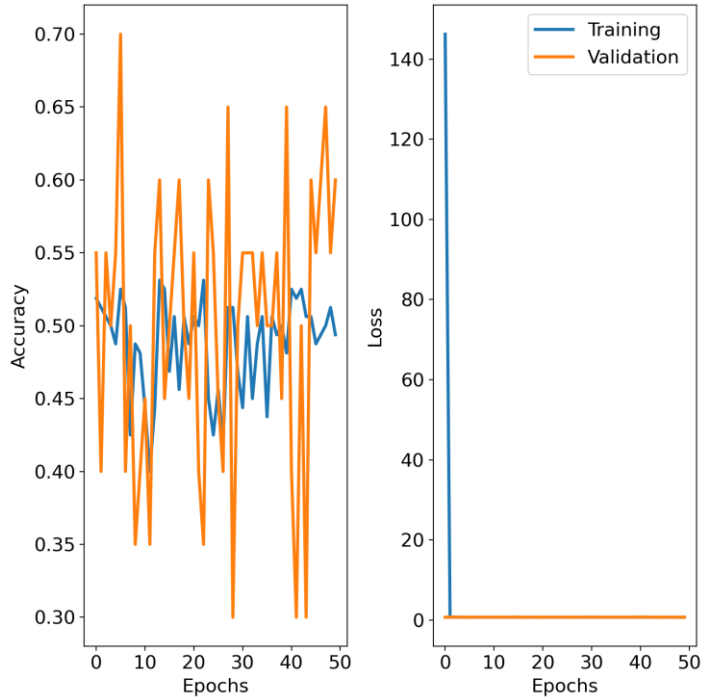
Pool size : 2
strides : 2

Flatten

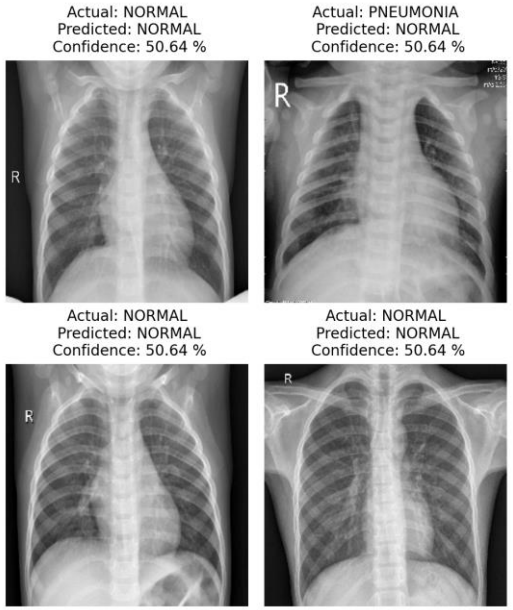
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

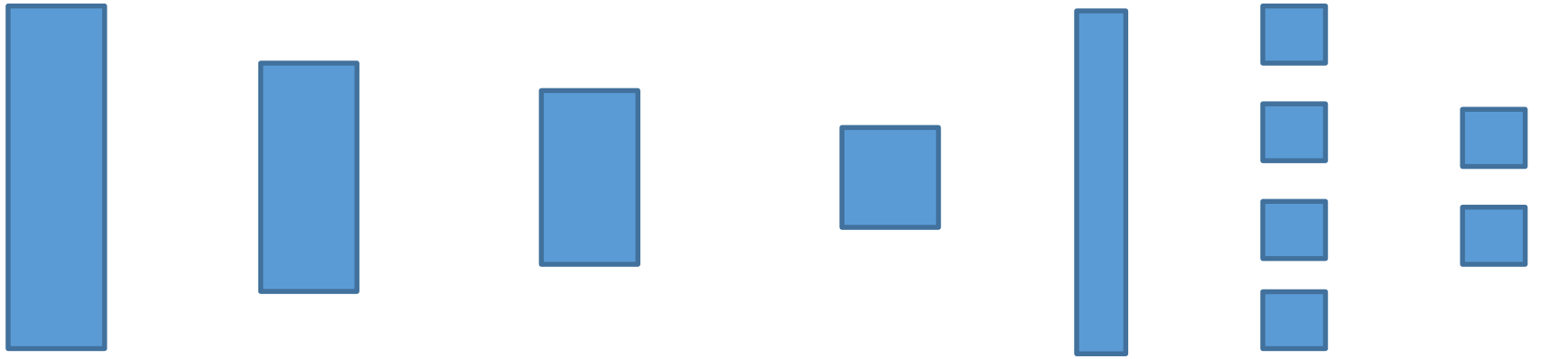
Epochs : 50
Learning Rate : 0.1
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 55.00 %



CNN - Learning Rate



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

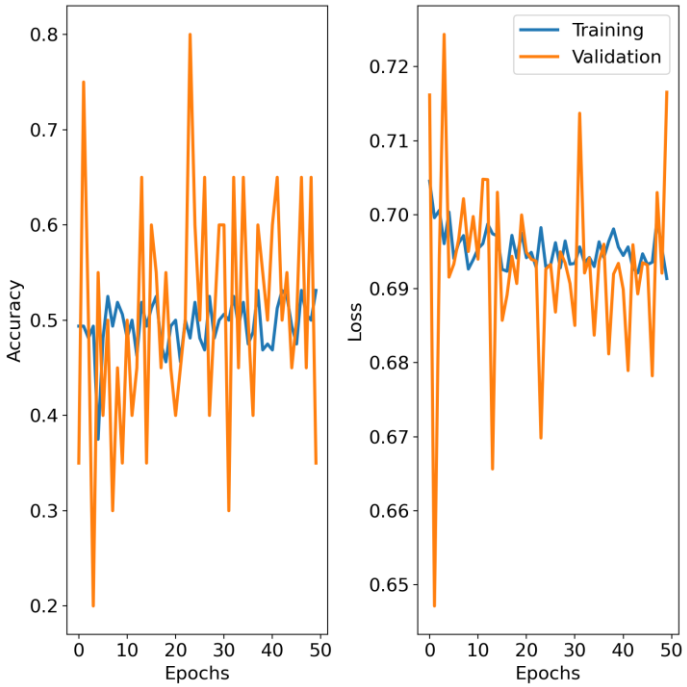
Pool size : 2
strides : 2

Flatten

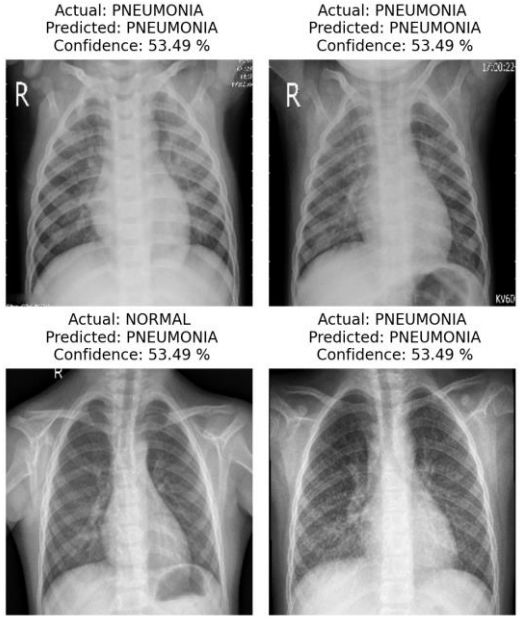
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

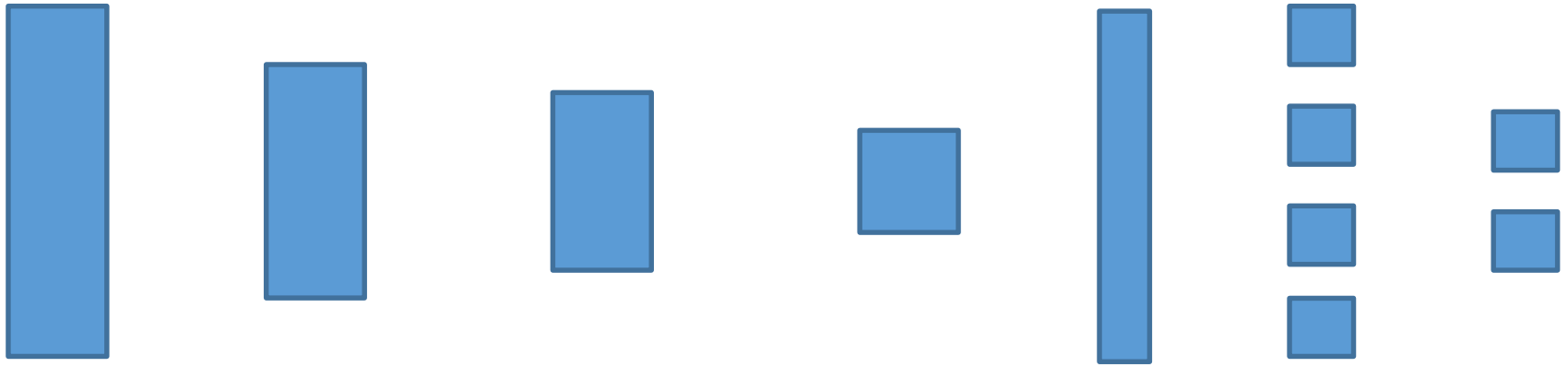
Epochs : 50
Learning Rate : 0.05
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 50.00 %



CNN - Learning Rate



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

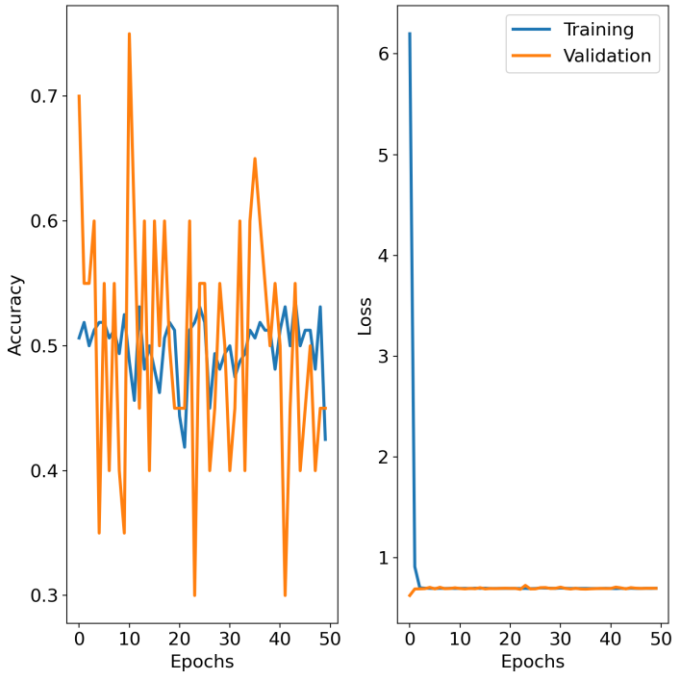
Pool size : 2
strides : 2

Flatten

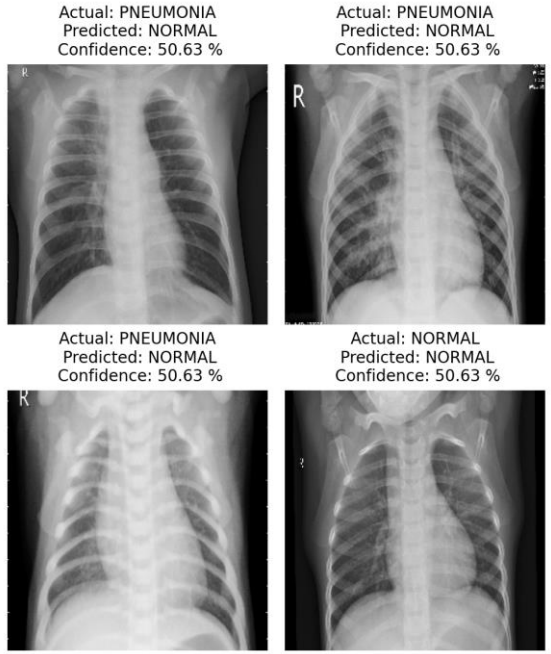
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

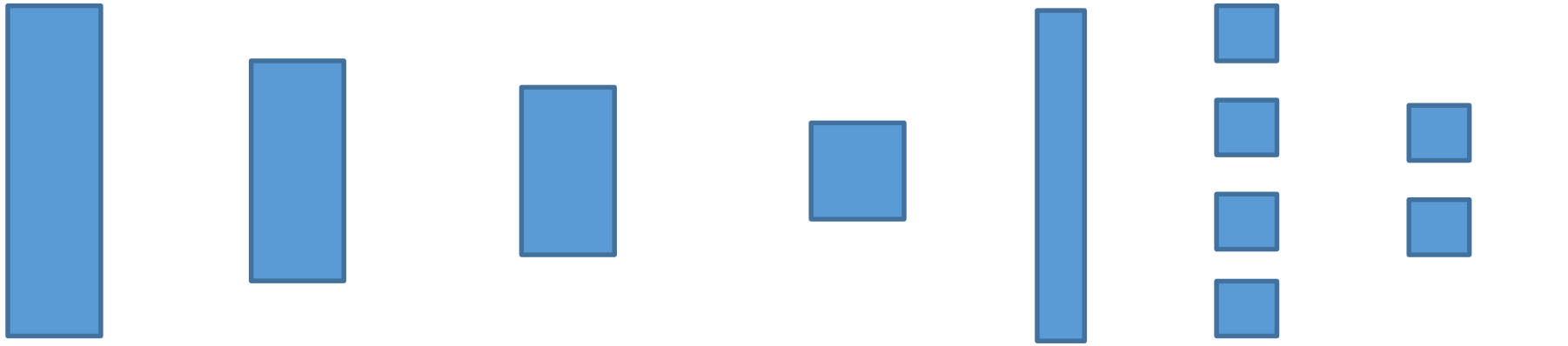
Epochs : 50
Learning Rate : 0.03
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 45.00 %



CNN - Learning Rate



Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Filters : 32
Kernel : 3
Stride : 2

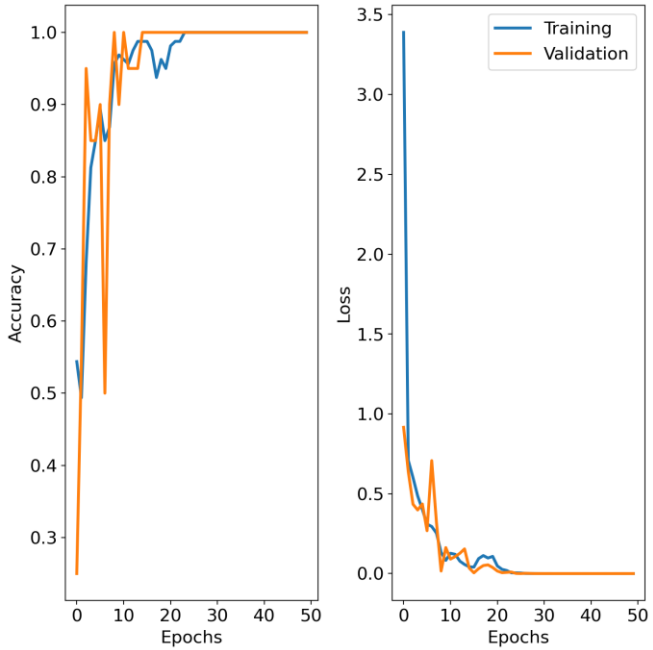
Pool size : 2
strides : 2

Flatten

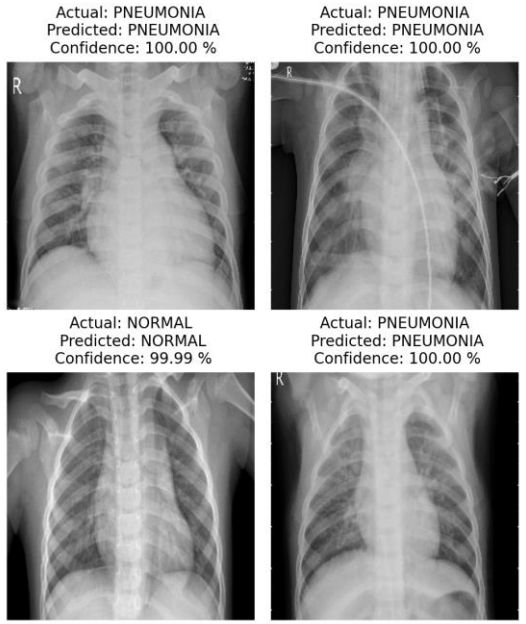
Dense : 64
Act. : Relu

Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.02
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale

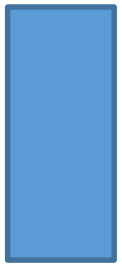


Model Score : 100.00 %

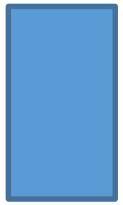


CNN – Batch Size

Filters : 32
Kernel : 3
Stride : 2



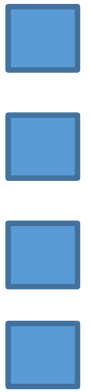
Pool size : 2
strides : 2



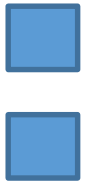
Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Flatten

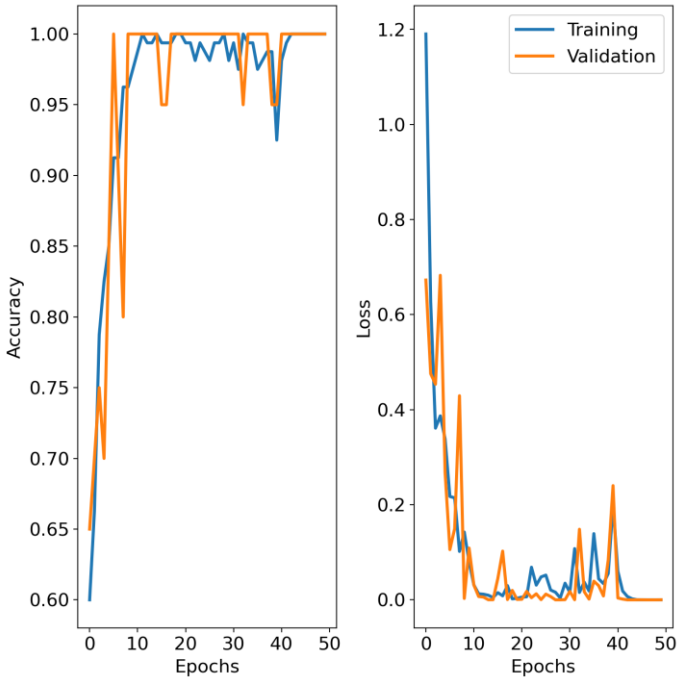


Dense : 64
Act. : Relu

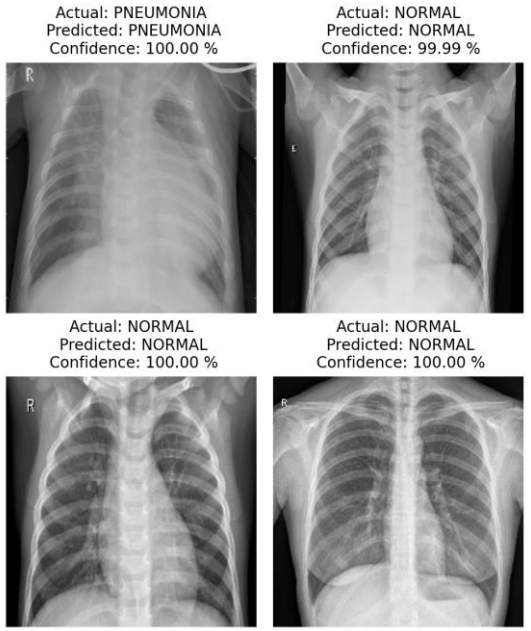


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 10
Normal : 100
Pneumonia : 100
Color : greyscale

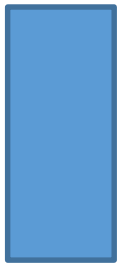


Model Score : 100.00 %

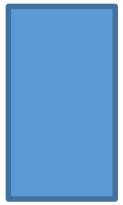


CNN – Batch Size

Filters : 32
Kernel : 3
Stride : 2



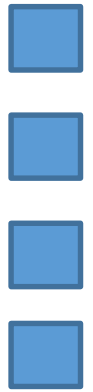
Pool size : 2
strides : 2



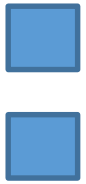
Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Flatten

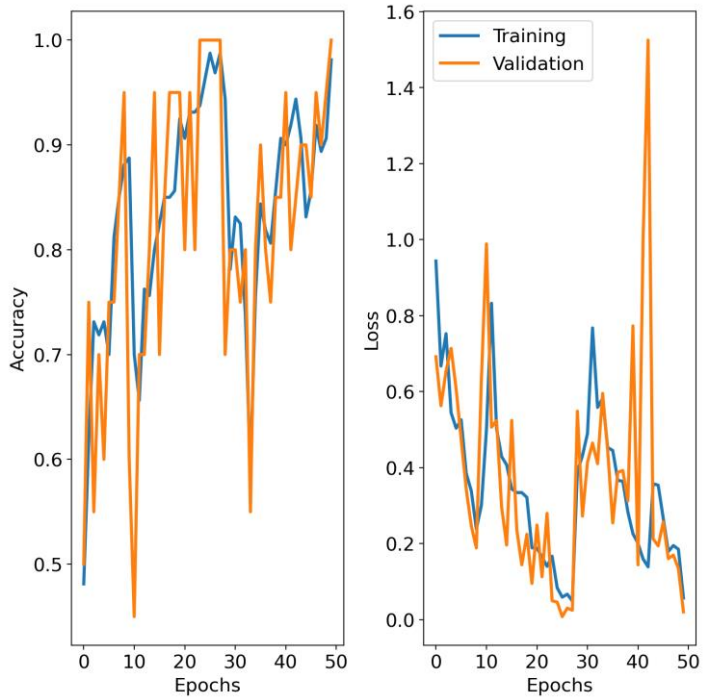


Dense : 64
Act. : Relu

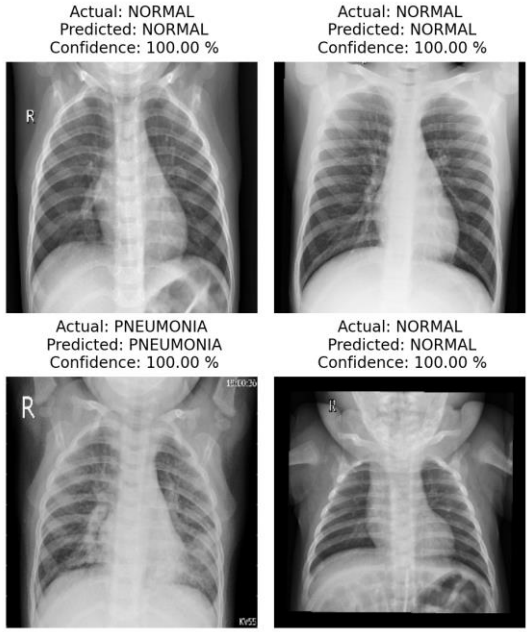


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 5
Normal : 100
Pneumonia : 100
Color : greyscale

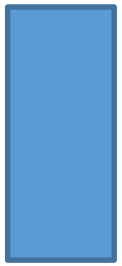


Model Score : 100.00 %

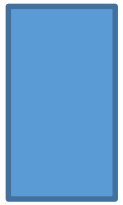


CNN – Batch Size

Filters : 32
Kernel : 3
Stride : 2



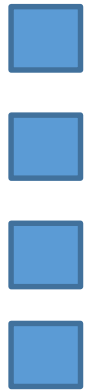
Pool size : 2
strides : 2



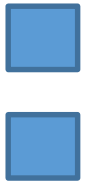
Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Flatten

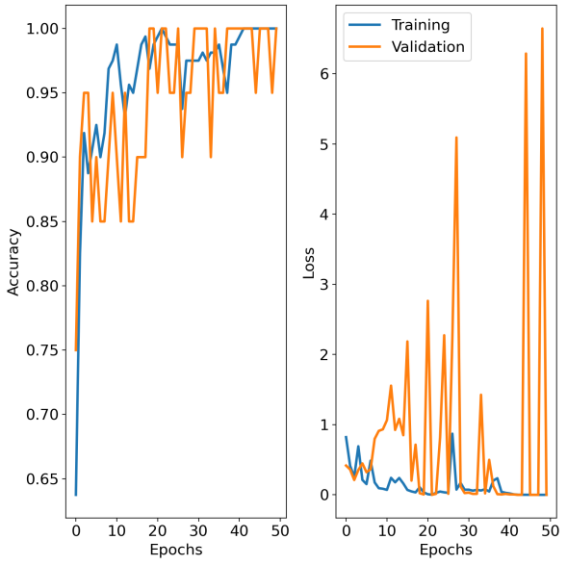


Dense : 64
Act. : Relu

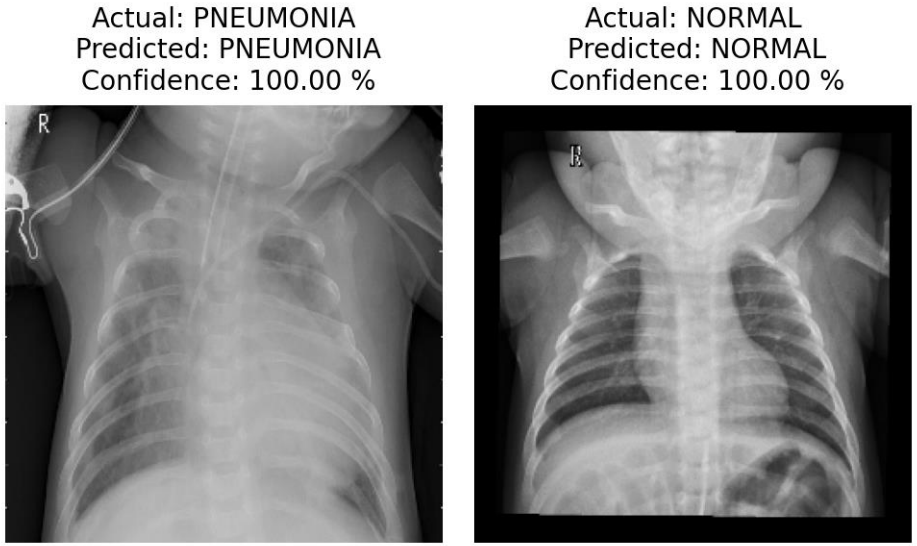


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 1
Normal : 100
Pneumonia : 100
Color : greyscale

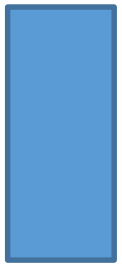


Model Score : 85.00 %

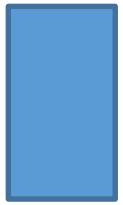


CNN - Convolutional layer

Filters : 32
Kernel : 3
Stride : 2



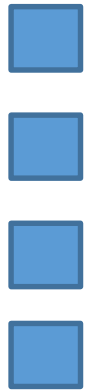
Pool size : 2
strides : 2



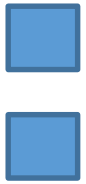
Filters : 32
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Flatten

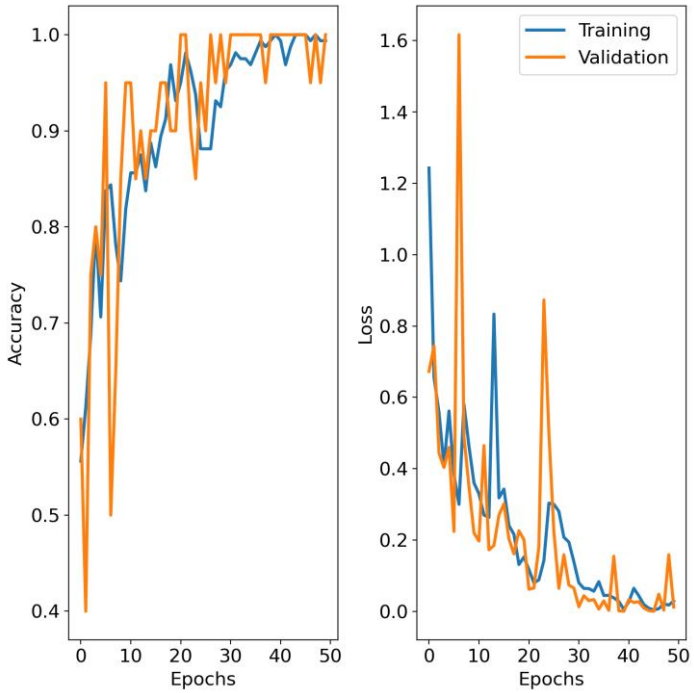


Dense : 64
Act. : Relu

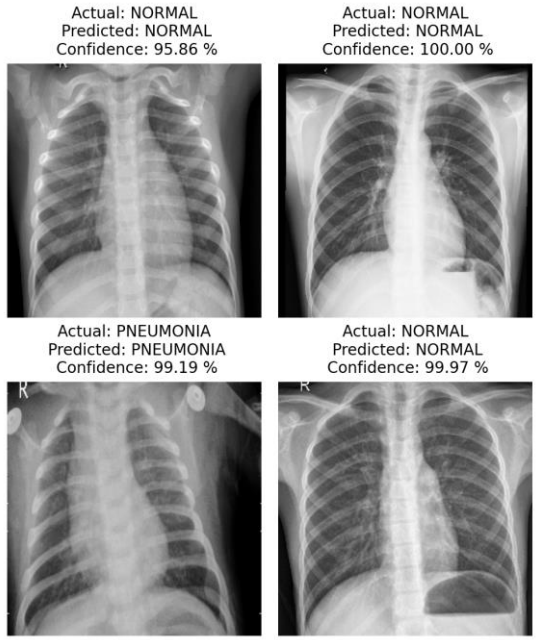


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale

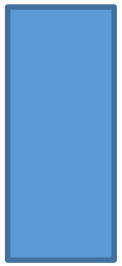


Model Score : 100.00 %



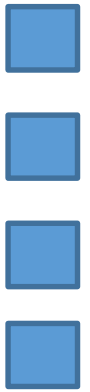
CNN – Convolutional layer

Filters : 32
Kernel : 3
Stride : 2

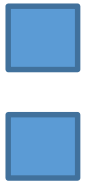


Pool size : 2
strides : 2

Flatten

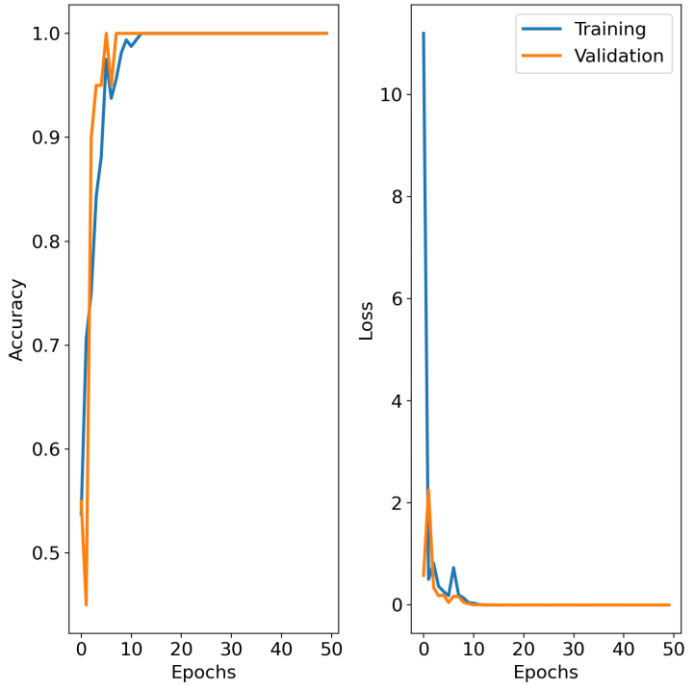


Dense : 64
Act. : Relu

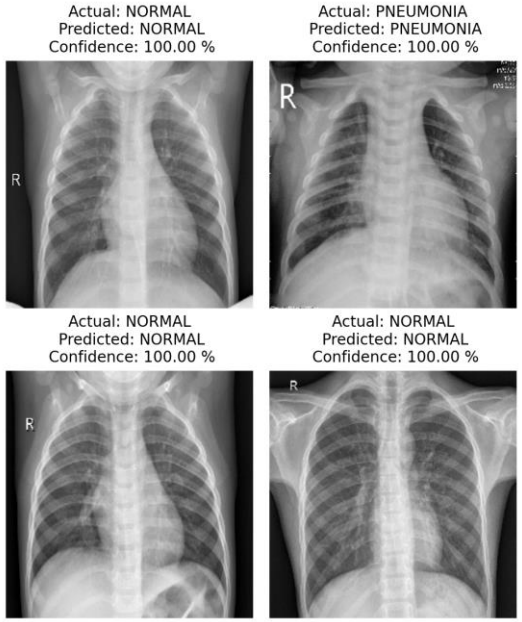


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale

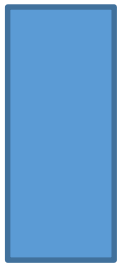


Model Score : 100.00 %



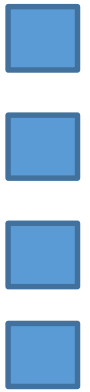
CNN – Filters

Filters : 16
Kernel : 3
Stride : 2

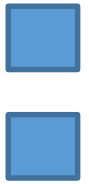


Pool size : 2
strides : 2

Flatten

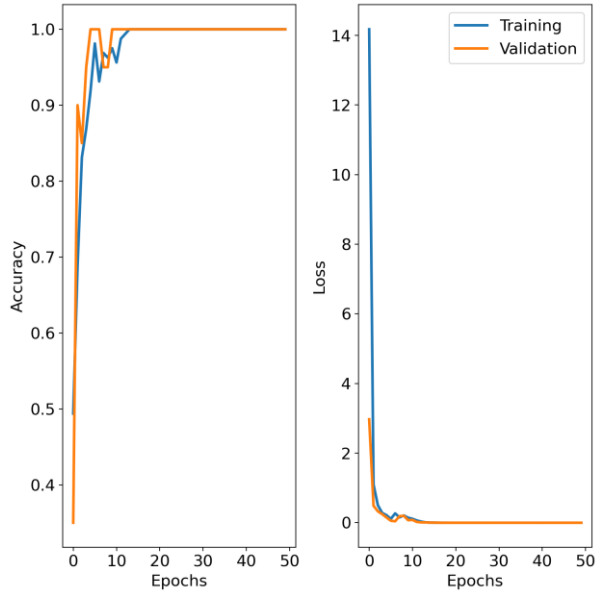


Dense : 64
Act. : Relu

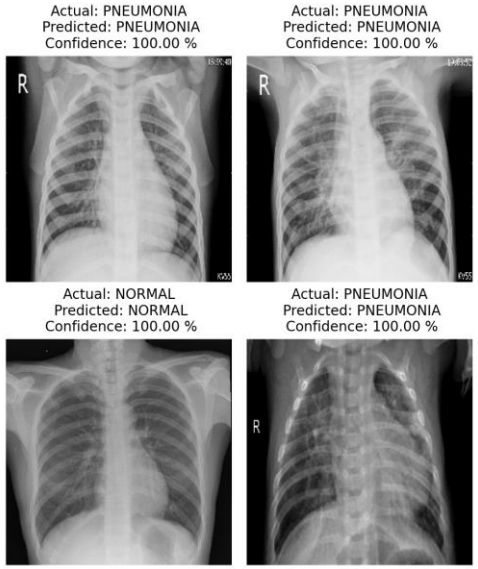


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale

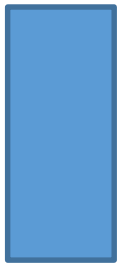


Model Score : 100.00 %



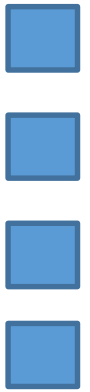
CNN – Filters (best)

Filters : 32
Kernel : 3
Stride : 2

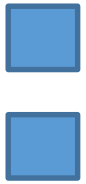


Pool size : 2
strides : 2

Flatten

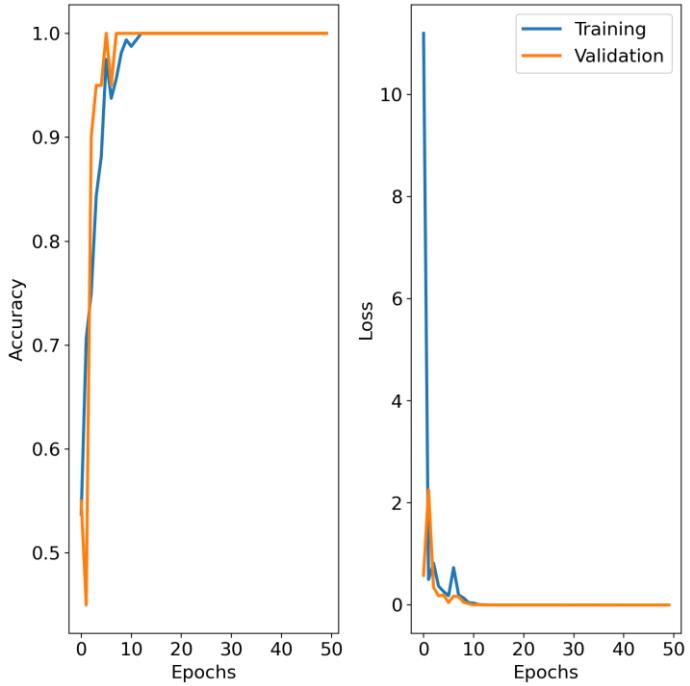


Dense : 64
Act. : Relu

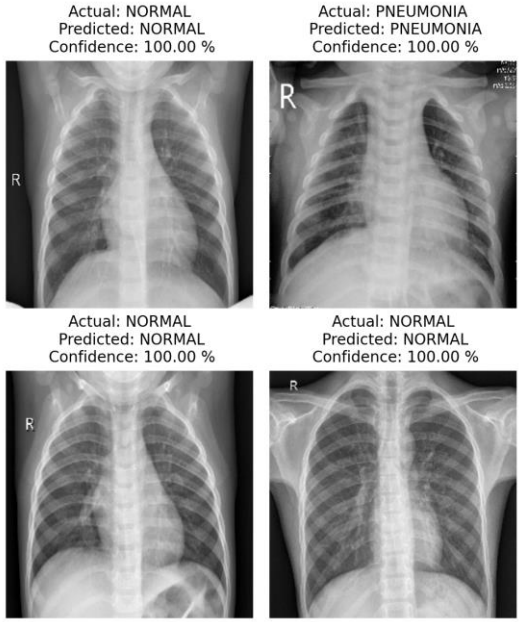


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale

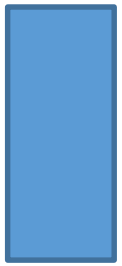


Model Score : 100.00 %



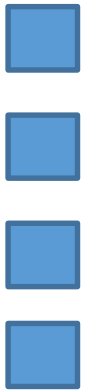
CNN – Filters

Filters : 64
Kernel : 3
Stride : 2

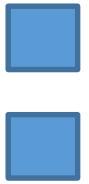


Pool size : 2
strides : 2

Flatten

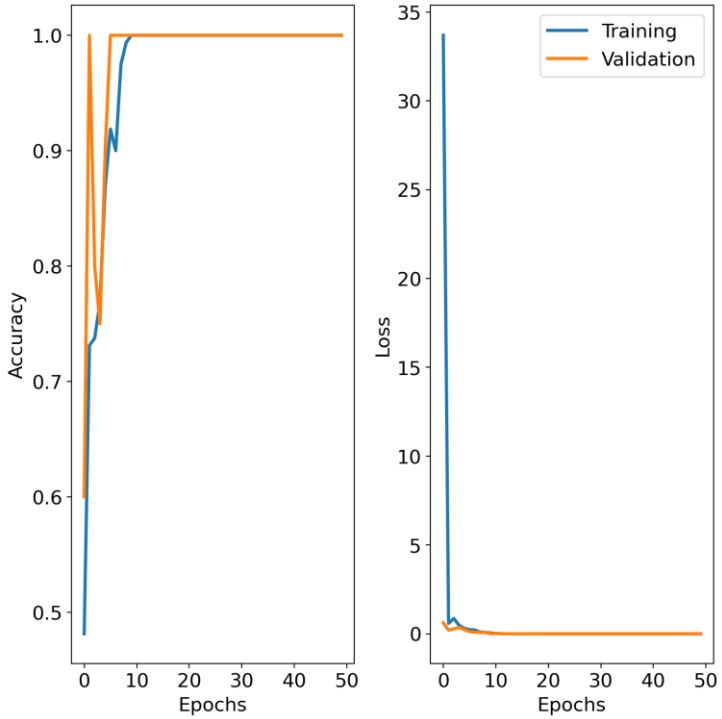


Dense : 64
Act. : Relu

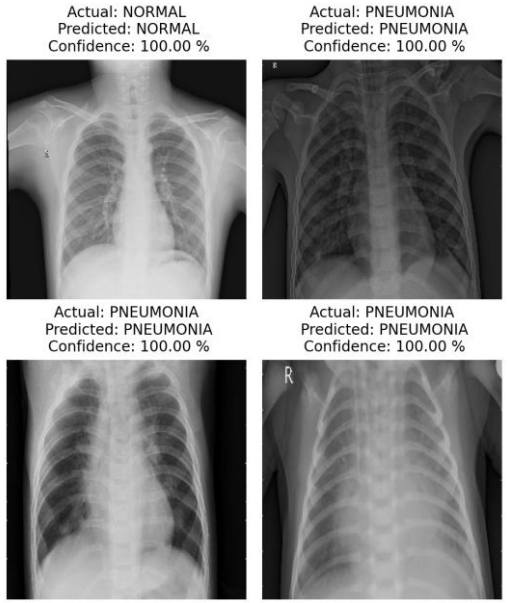


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale

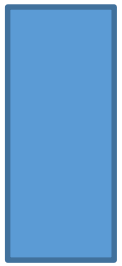


Model Score : 100.00 %



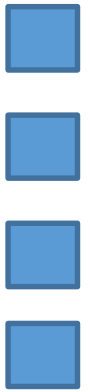
CNN – Filters

Filters : 128
Kernel : 3
Stride : 2

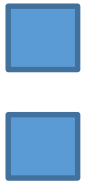


Pool size : 2
strides : 2

Flatten

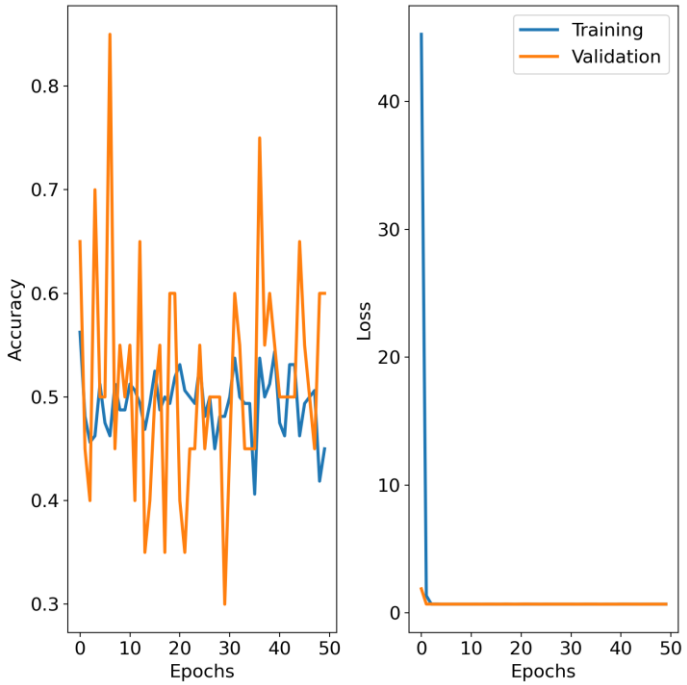


Dense : 64
Act. : Relu

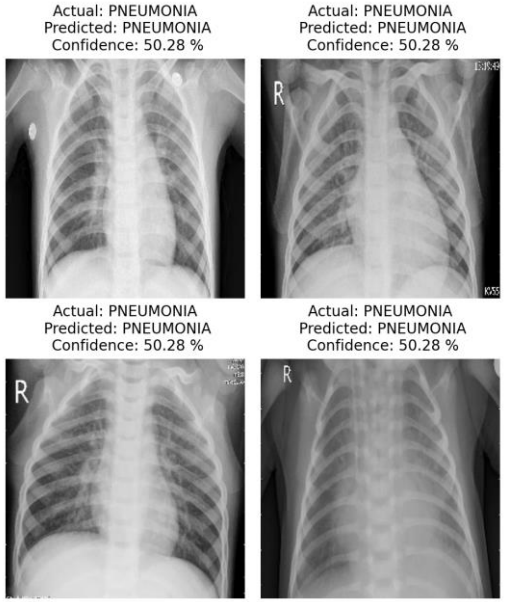


Dense : 2
Act. : Softmax

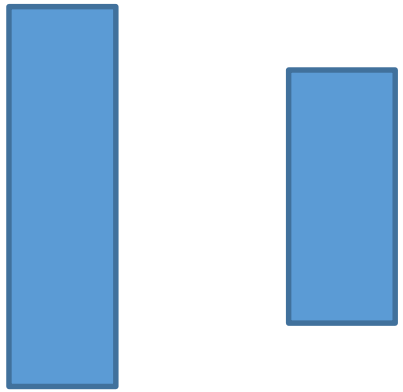
Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 30.00 %



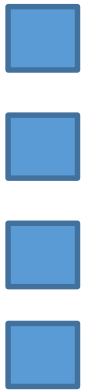
CNN – Neurons



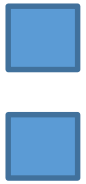
Filters : 16
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Flatten

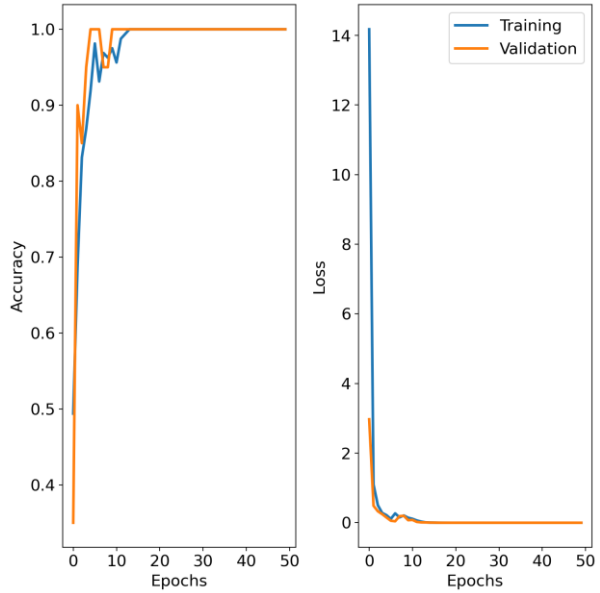


Dense : 64
Act. : Relu

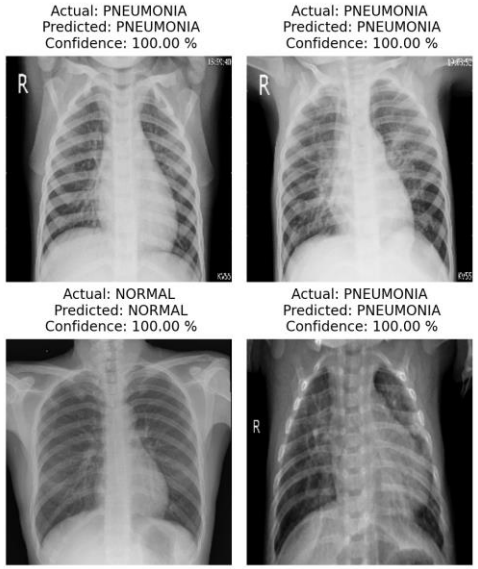


Dense : 2
Act. : Softmax

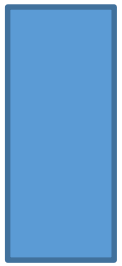
Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 100.00 %

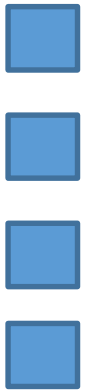


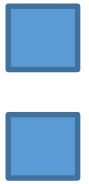
CNN – Neurons



Filters : 16
Kernel : 3
Stride : 2

Pool size : 2
strides : 2



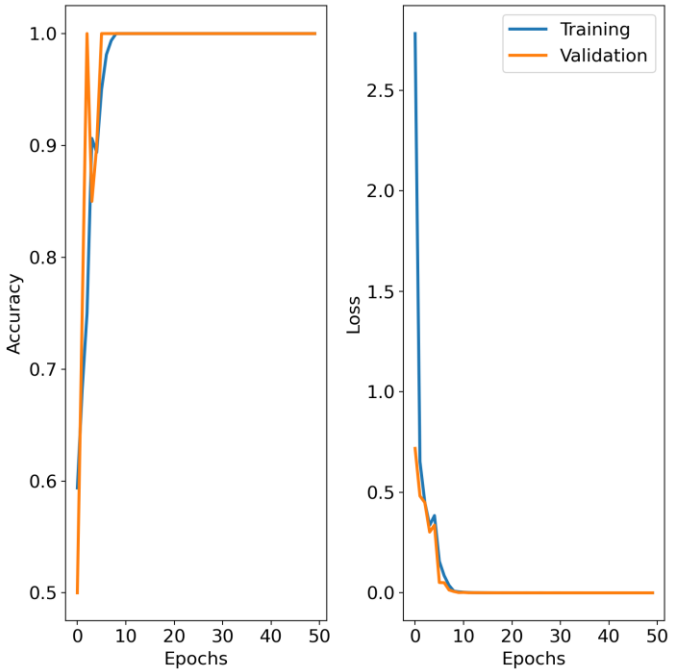


Flatten

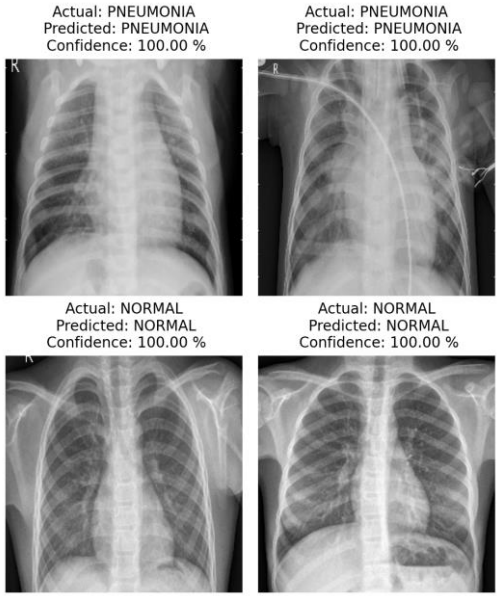
Dense : 32
Act. : Relu

Dense : 2
Act. : Softmax

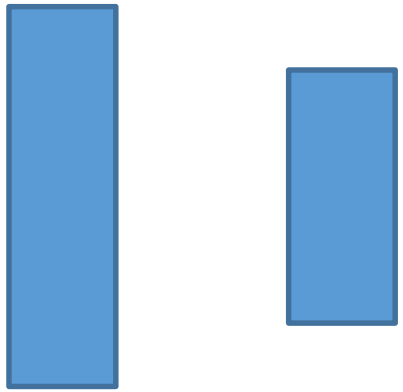
Epochs : 50
Learning Rate : 0.01
Batch size : 20
Normal : 100
Pneumonia : 100
Color : greyscale



Model Score : 100.00 %



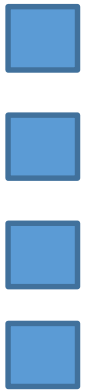
CNN – Neurons



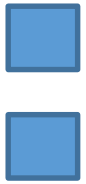
Filters : 16
Kernel : 3
Stride : 2

Pool size : 2
strides : 2

Flatten

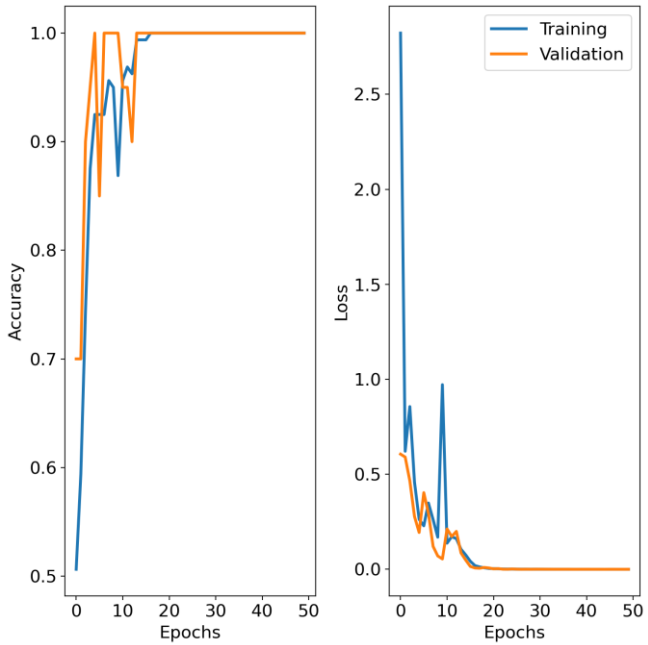


Dense : 16
Act. : Relu

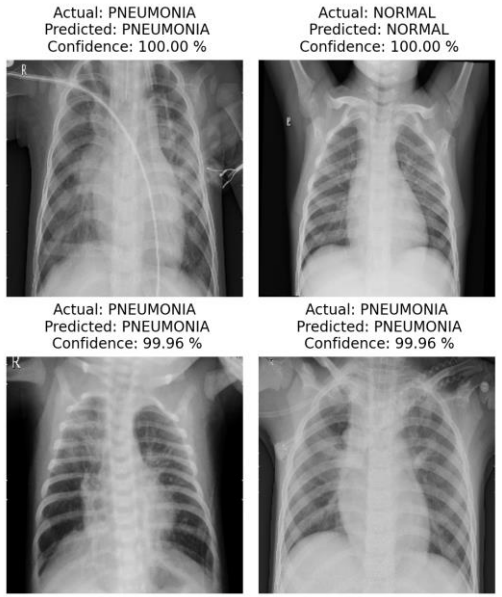


Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : 20
Data : 200
Color : greyscale

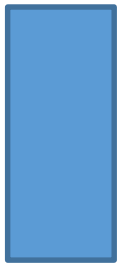


Model Score : 100.00 %



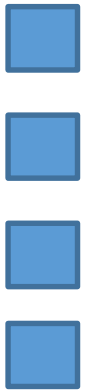
CNN – Datasets

Filters : 32
Kernel : 3
Stride : 2

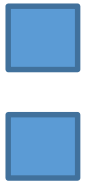


Pool size : 2
strides : 2

Flatten

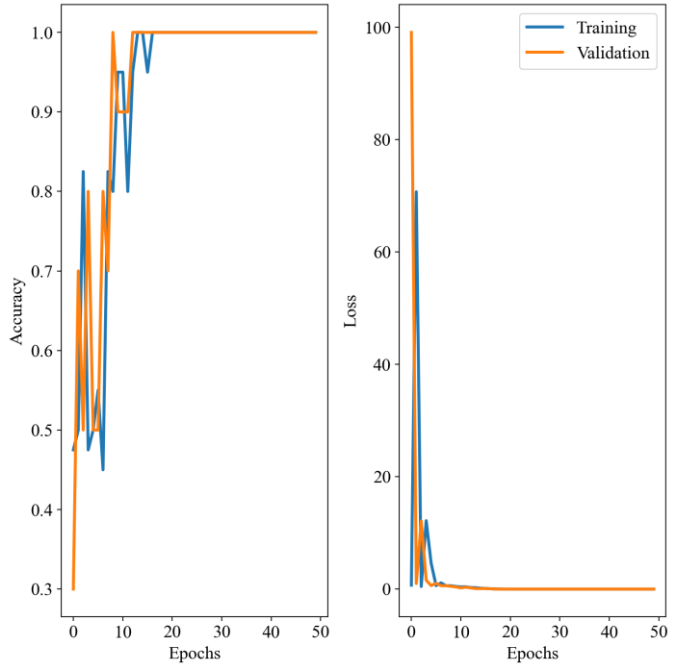


Dense : 32
Act. : Relu



Dense : 2
Act. : Softmax

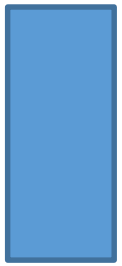
Epochs : 50
Learning Rate : 0.01
Batch size : NA
Data : 50
Color : greyscale



Model Score : 100.00 %

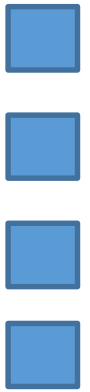
CNN – Datasets

Filters : 32
Kernel : 3
Stride : 2

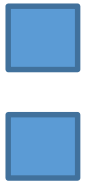


Pool size : 2
strides : 2

Flatten

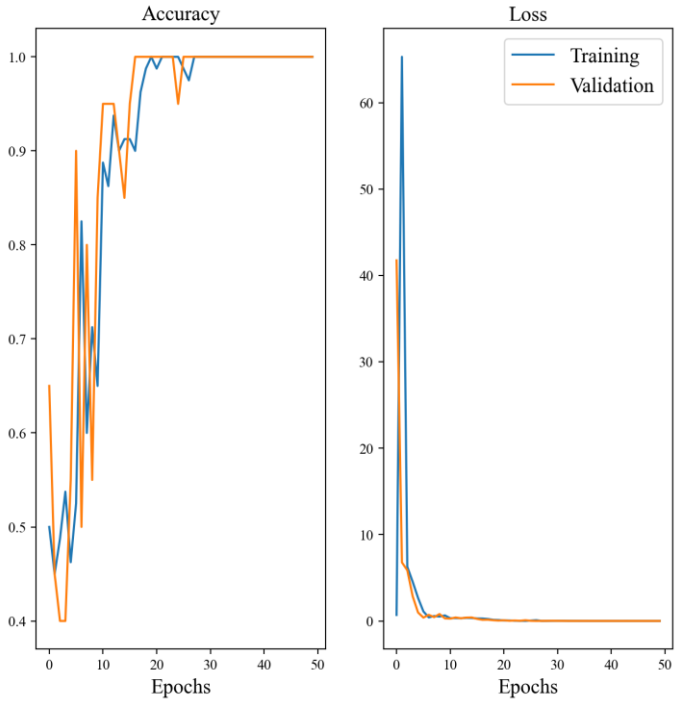


Dense : 32
Act. : Relu



Dense : 2
Act. : Softmax

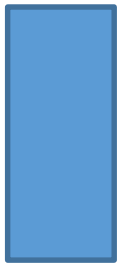
Epochs : 50
Learning Rate : 0.01
Batch size : NA
Data : 100
Color : greyscale



Model Score : 100.00 %

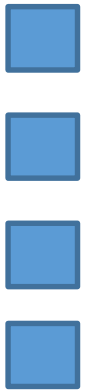
CNN – Datasets

Filters : 32
Kernel : 3
Stride : 2

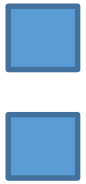


Pool size : 2
strides : 2

Flatten

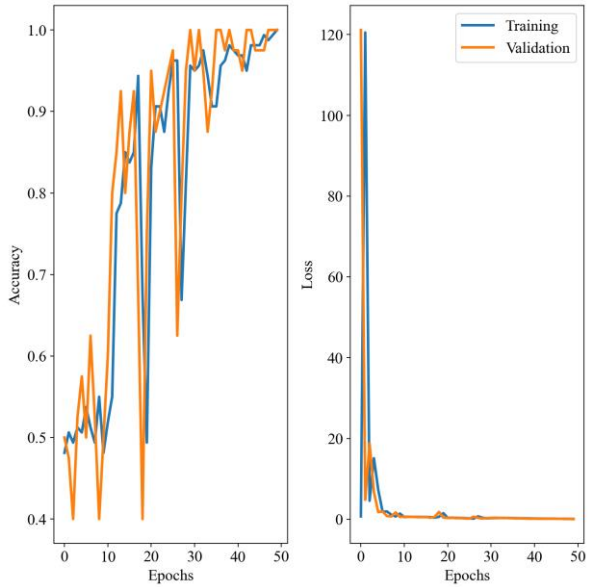


Dense : 32
Act. : Relu



Dense : 2
Act. : Softmax

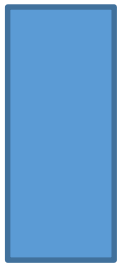
Epochs : 50
Learning Rate : 0.01
Batch size : NA
Data : 200
Color : greyscale



Model Score : 100.00 %

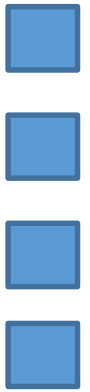
CNN – Datasets

Filters : 32
Kernel : 3
Stride : 2

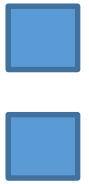


Pool size : 2
strides : 2

Flatten

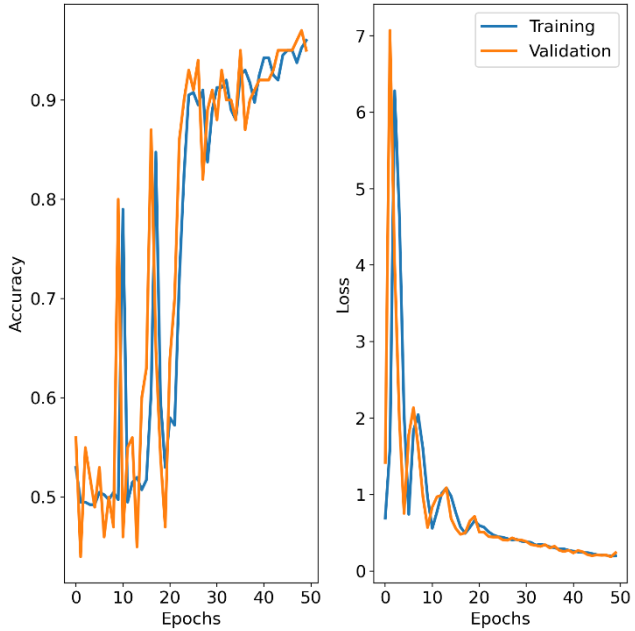


Dense : 32
Act. : Relu



Dense : 2
Act. : Softmax

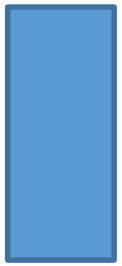
Epochs : 50
Learning Rate : 0.01
Batch size : NA
Data : 500
Color : greyscale



Model Score : 95.00 %

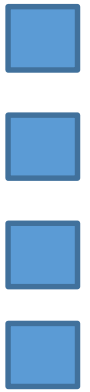
CNN – Datasets

Filters : 32
Kernel : 3
Stride : 2

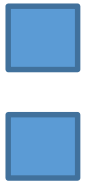


Pool size : 2
strides : 2

Flatten

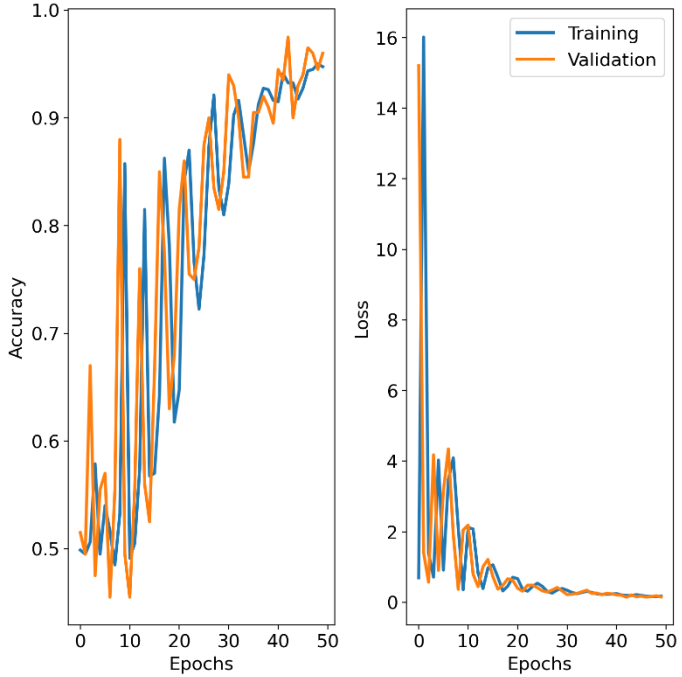


Dense : 32
Act. : Relu



Dense : 2
Act. : Softmax

Epochs : 50
Learning Rate : 0.01
Batch size : NA
Data : 1000
Color : greyscale



Model Score : 100.00 %