Dataset Description:

- **View: PA**
  - **COVID:**
    - **ieee8023.github Dataset: 123**
  - **Non COVID:**
    - **ieee8023.github Dataset: 46**
      - **ARDS: 5**
      - **Bacterial Pneumonia: 17**
      - **Chlamydophila (Bacterial): 1**
      - **Fungal Pneumonia: 13**
      - **Klebsiella (Bacterial): 1**
      - **Legionella (Bacterial): 2**
      - **MERS (CORONA Virus): 0**
      - **No Finding: 1**
      - **Pneumocystis (Fungal): 13**
      - **Pneumonia: 144**
      - **SARS (CORONA Virus): 11**
      - **Streptococcus (Bacterial): 13**
      - **Viral Pneumonia: 110**
    - **Kaggle Pneumonia Dataset: 72**
      - **Normal: 33**
      - **Pneumonia: 39**

Model Description:

InceptionResNetV2 -> AveragePooling -> Flatten -> Dense -> Dense(Result)

- **Description:**

  Loss Function: Cosine Similarity
  Pretrained weight: ImageNet(layers are trainable)
  Optimizer: sgd
  lr: 0.001
  Batch size: 10
  Epoch: 50
  Early Stop: True (after 20 epoch(patience))
  Decay rate: lr/Epoch

Result: 10 Fold Cross-validation

Fold no: 1

	precision	recall	f1-score	support
Covic	0.83	1.00	0.91	15
Non_Covic	1.00	0.70	0.82	10
accuracy			0.88	25
macro avg	0.92	0.85	0.87	25
weighted avg	0.90	0.88	0.87	25

acc: 0.8800
sensitivity: 1.0000
specificity: 0.7000

CM: 15 0
    3 7

Fold no: 2

	precision	recall	f1-score	support
Covic	0.92	1.00	0.96	11
Non_Covic	1.00	0.92	0.96	13
accuracy			0.96	24
macro avg	0.96	0.96	0.96	24
weighted avg	0.96	0.96	0.96	24

acc: 0.9583
sensitivity: 1.0000
specificity: 0.9231

CM: 11 0
    1 12

Fold no: 3

	precision	recall	f1-score	support
Covic	1.00	0.87	0.93	15
Non_Covic	0.82	1.00	0.90	9
accuracy			0.92	24
macro avg	0.91	0.93	0.91	24
weighted avg	0.93	0.92	0.92	24

acc: 0.9167 (Highest 0.9583)
sensitivity: 0.8667
specificity: 1.0000

CM: 13 2
    0 9

Fold no: 4

	precision	recall	f1-score	support
Covic	0.67	1.00	0.80	10
Non_Covic	1.00	0.64	0.78	14
accuracy			0.79	24
macro avg	0.83	0.82	0.79	24
weighted avg	0.86	0.79	0.79	24

acc: 0.79(Highest 0.8750)
sensitivity: 1.0000
specificity:

CM: 10 0
    5 9

Fold no: 5

	precision	recall	f1-score	support
Covic	0.85	1.00	0.92	11
Non_Covic	1.00	0.85	0.92	13
accuracy			0.92	24
macro avg	0.92	0.92	0.92	24
weighted avg	0.93	0.92	0.92	24

acc: 0.9167
sensitivity: 1.0000
specificity: 0.8462

CM: 11 0
     2 11

Fold no: 6

	precision	recall	f1-score	support
Covic	0.86	0.92	0.89	13
Non_Covic	0.90	0.82	0.86	11
accuracy			0.88	24
macro avg	0.88	0.87	0.87	24
weighted avg	0.88	0.88	0.87	24

acc: 0.8750 (Highest 0.9183)
sensitivity: 0.9231
specificity: 0.8182

CM: 12 1
2 9

Fold no: 7

	precision	recall	f1-score	support
Covic	0.83	1.00	0.91	15
Non_Covic	1.00	0.67	0.80	9
accuracy			0.88	24
macro avg	0.92	0.83	0.85	24
weighted avg	0.90	0.88	0.87	24

acc: 0.8750 (Highest 0.9183)
sensitivity: 1.0000
specificity: 0.6667

CM: 15 0
3 6

Fold no: 8

	precision	recall	f1-score	support
Covic	1.00	0.86	0.92	14
Non_Covic	0.83	1.00	0.91	10
accuracy			0.92	24
macro avg	0.92	0.93	0.92	24
weighted avg	0.93	0.92	0.92	24

acc: 0.9167 (Highest 1.00)
sensitivity: 0.8571
specificity: 1.0000

CM: 12 2
0 10

Fold no: 9

	precision	recall	f1-score	support
Covic	0.77	1.00	0.87	10
Non_Covic	1.00	0.79	0.88	14
accuracy			0.88	24
macro avg	0.88	0.89	0.87	24
weighted avg	0.90	0.88	0.88	24

acc: 0.8750
sensitivity: 1.0000
specificity: 0.7857

CM: 10 0
3 11

Fold no: 10

ResourceExhaustedError: OOM when allocating tensor with shape[1088,384,1,1] and type float on /job:localhost/replica:0/task:0/device:GPU:0 by allocator GPU_0_bfc
[[node model_9/block17_6_conv/Conv2D (defined at C:\Users\Mahir Mahbub\Desktop\Ten_fold.py:135)]]
Hint: If you want to see a list of allocated tensors when OOM happens, add report_tensor_allocations_upon_oom to RunOptions for current allocation info.
[Op:__inference_distributed_function_586364]

Function call stack:
distributed_function

Optimal Average Accuracy: 92.22%
Optimal Highest Accuracy: 100%
Trivial Highest Accuracy: 95.83%

Ill Doing:

Did not save model after every epoch

Possible Solution:

1. Discard SARS and MERS data from Non Covid dataset to increase non-covid accuracy
2. Brightness augmentation and rotation augmentation should not be applied. Rotational augmentation also should not be applied 150% Zooming augmentation applied.