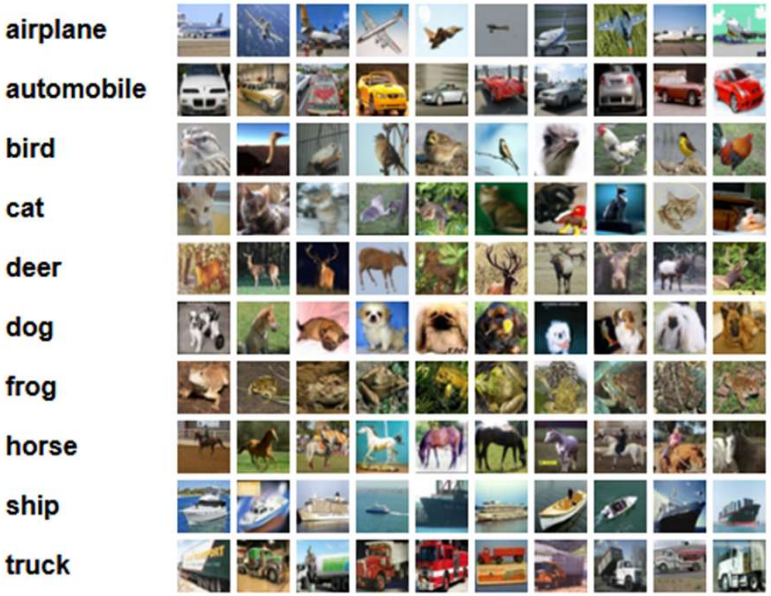
GROUP 2

Jan Fink

Happy Manaloto

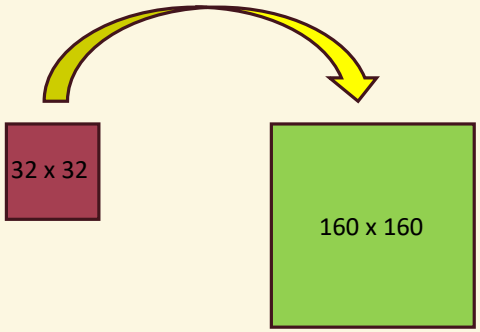
DEEP LEARNING FOR COMPUTER VISION

CIFAR -


airplane
automobile
bird
cat
deer
dog
frog
horse
ship
truck

DATA PREPROCESSING

- RESIZE TO 160X160 FOR MOBILENETV2



- ONE-HOT ENCODING OF LABELS

```
[6]
[3]
```

```
[0. 0. 0. 0. 0. 0. 1. 0. 0. 0.]
[0. 0. 0. 1. 0. 0. 0. 0. 0. 0.]
```

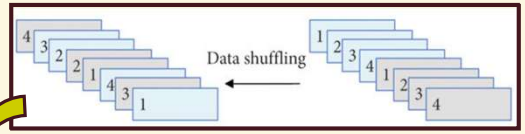
- NORMALIZATION

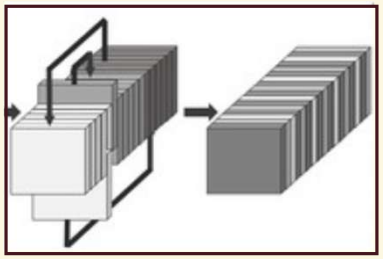
```
[[[ 59  62  63]
  [ 43  46  45]
  [ 50  48  43]
  ...
  [158 132 108]
  [152 125 102]
  [148 124 103]]

 [[ 16  20  20]
  [  0   0   0]
  [ 18   8   0]
  ...
  [123  88  55]
  [119  83  50]
  [122  87  57]]
```

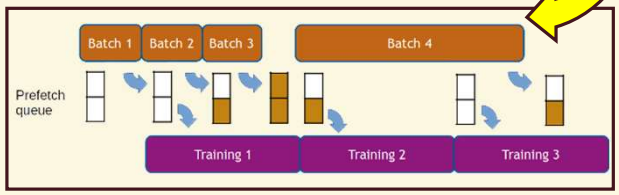
Data Values	Normalized
13	0
16	0.0517
19	0.1034
22	0.1552
23	0.1724
38	0.4310
47	0.5862
56	0.7414
58	0.7759
63	0.8621
65	0.8966

```
[0.3254902  0.20784314 0.13333334]]

[[0.69411767 0.5647059  0.45490196]
 [0.65882355 0.5058824  0.36862746]
 [0.7019608  0.5568628  0.34117648]
 ...
 [0.84705883 0.72156864 0.54901963]
 [0.5921569  0.4627451  0.32941177]
 [0.48235294 0.36078432 0.28235295]]]
[[0.61960787 0.4392157  0.19215687]
 [0.62352943 0.43529412 0.18431373]
 [0.64705884 0.45490196 0.2        ]
 ...
 [0.5372549  0.37254903 0.14117648]
 [0.49411765 0.35686275 0.14117648]
 [0.45490196 0.33333334 0.12941177]]
```

- TF.DATA PIPELINE FOR PERFORMANCE

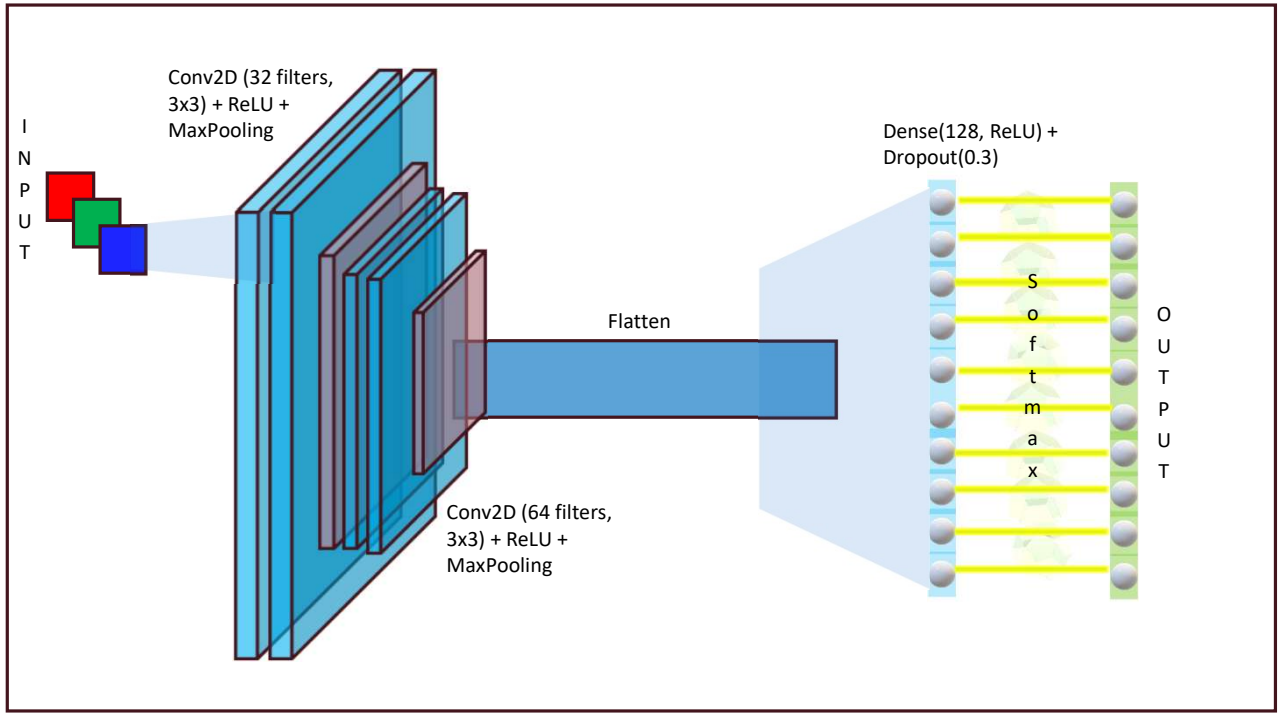






CONVOLUTIONAL NEURAL NETWORK ARCHITECTURE

- INPUT: (32, 32, 3)
- CONV2D
- MAXPOOLING
- DENSE(128) + DROPOUT
- OUTPUT: DENSE(10)

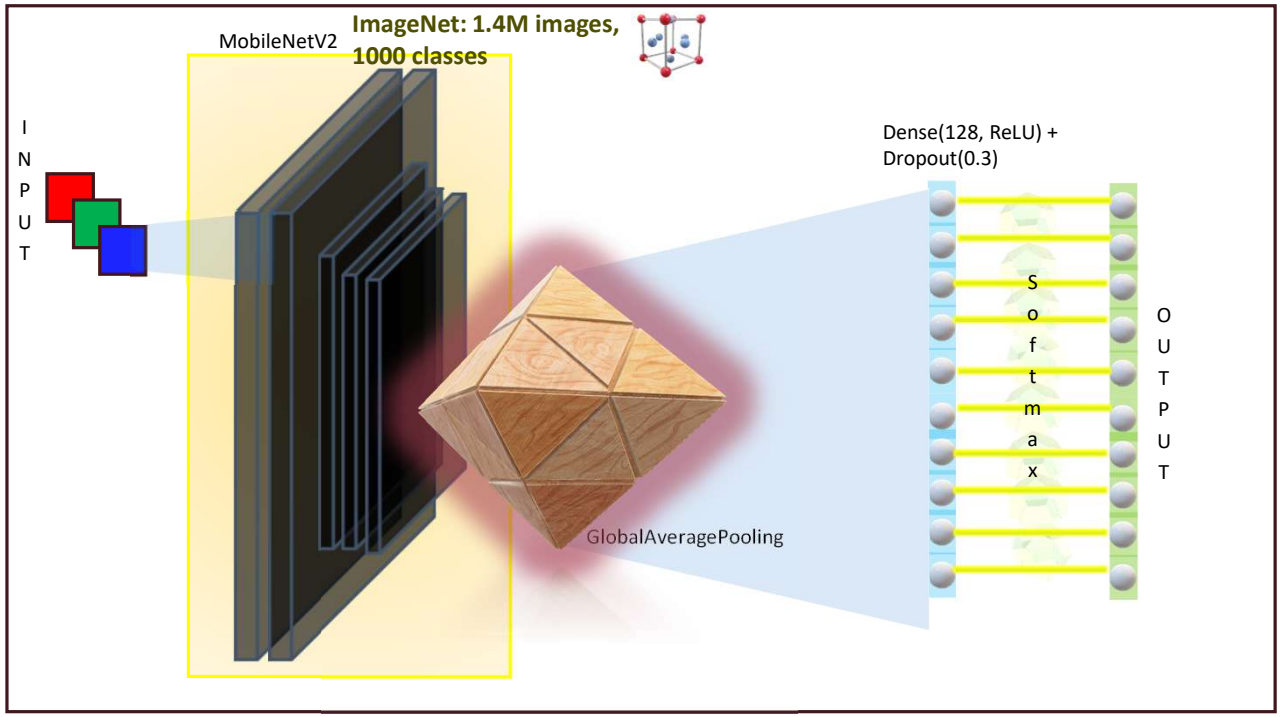


OPTIMIZATION TECHNIQUES

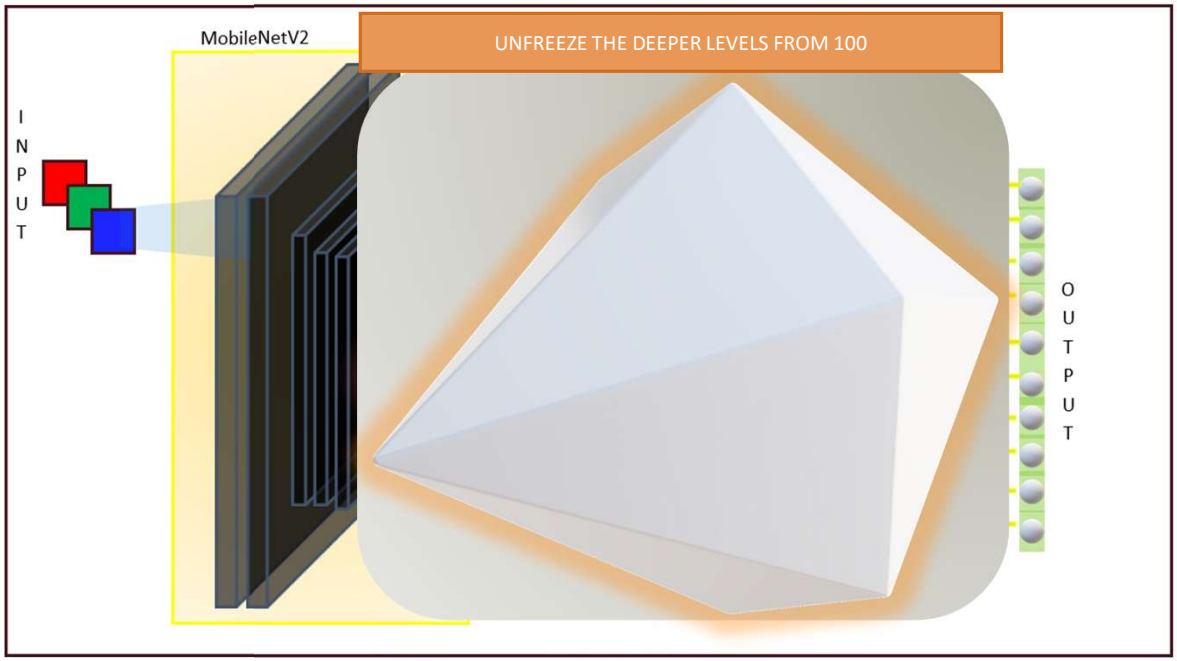
- ADAM
- CATEGORICAL CROSSENTROPY
- ACCURACY
- EARLY STOPPING

TRANSFER LEARNING

- INPUT: (160, 160, 3)
- MOBILENETV2
- GAP
- DENSE(128) + DROPOUT
- OUTPUT: DENSE(10)

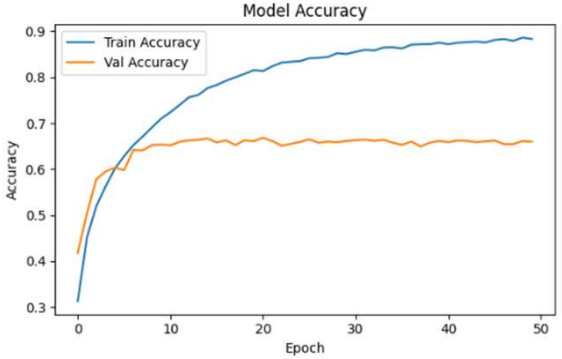


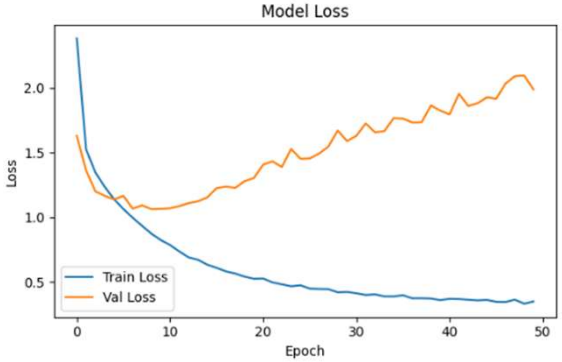
FINE TUNING


MobileNetV2
UNFREEZE THE DEEPER LEVELS FROM 100
INPUT
OUTPUT

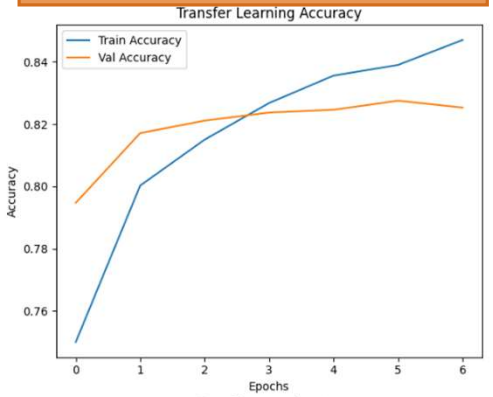
EVALUATION ON ACCURACIES AND LOSSES

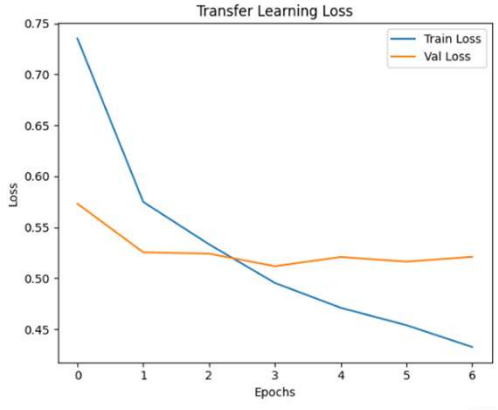
CNN BASE MODEL



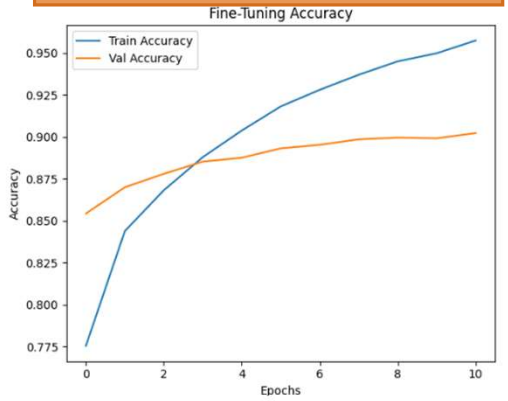


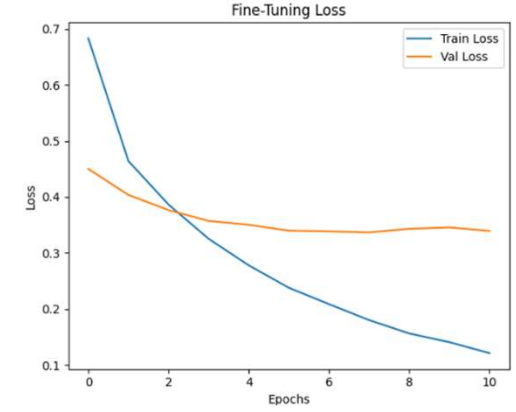
TRANSFER LEARNING





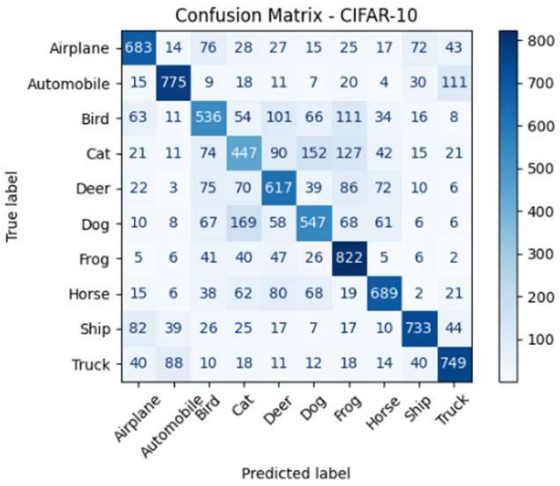
FINE TUNING



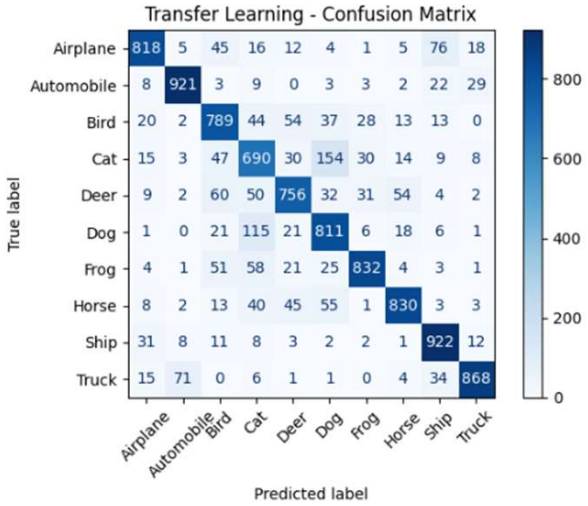


EVALUATION ON CONFUSION MATRICES

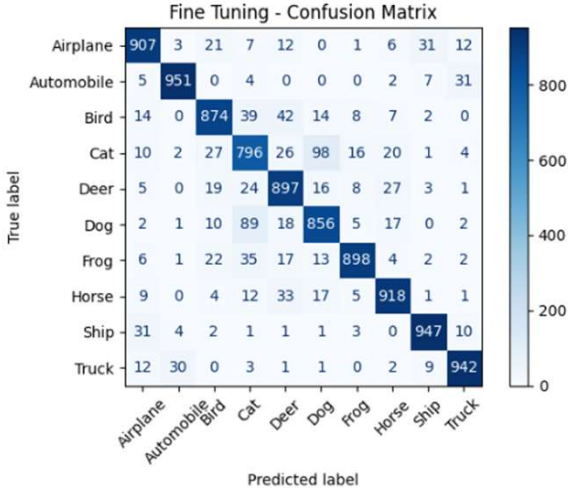
CNN BASE MODEL



TRANSFER LEARNING

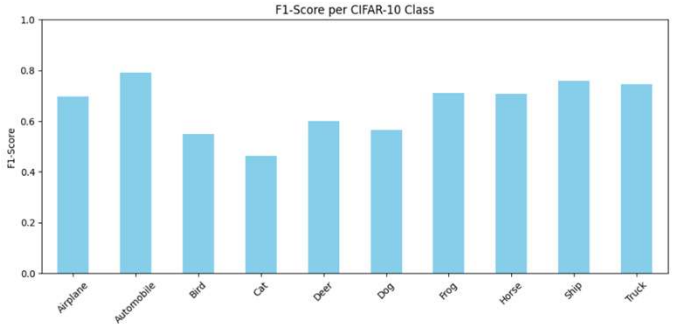


FINE TUNING

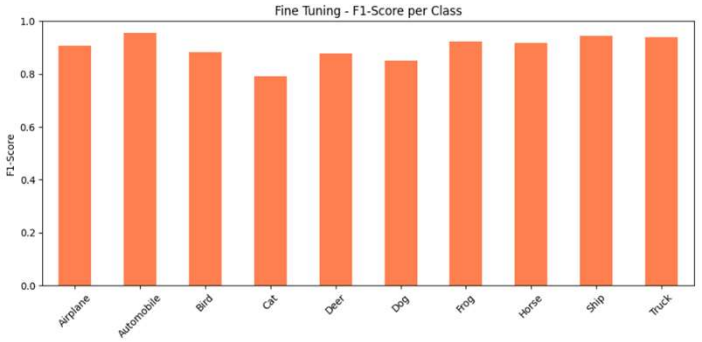


EVALUATION ON F1 SCORES

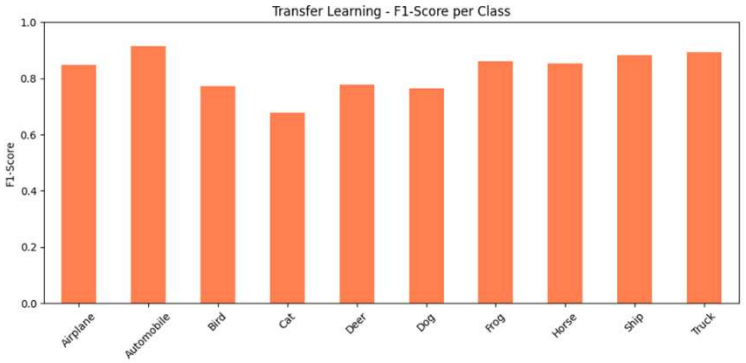
CNN BASE MODEL

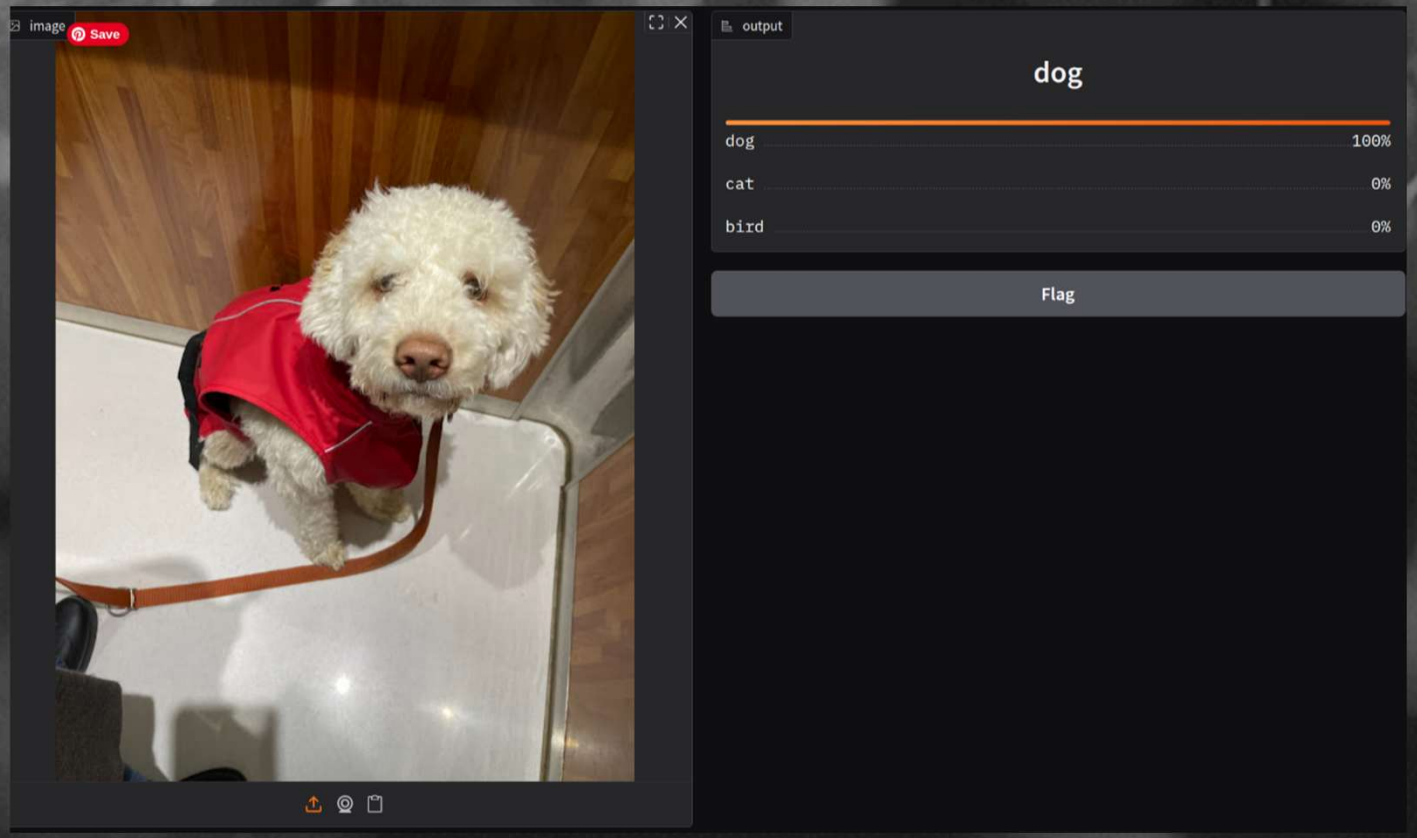


FINE TUNING



TRANSFER LEARNING





https://fecec6cb51659cd7c0.gradio.live/

PROJECT OVERVIEW

- Transfer learning significantly improved loss.
- Fine-tuning further optimized performance.
- Gradio made deployment simple and interactive.