

Anton Clayton

CS171











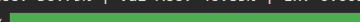
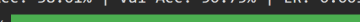
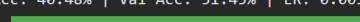
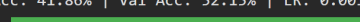
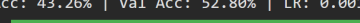
Professor Wood

December 2, 2025

CS171 Project Visuals

Many of my charts and visuals were cut off in my PDF download of my Colab notebook. I wanted to provide all the visuals just in case. Text based outputs should be rendered without issues on the PDF.

3.2 Training and Validation

```
Starting Training Loop...
Epoch 1/50 [Train]: 100%  250/250 [00:44<00:00, 5.31batch/s, loss=2.19]
Epoch [1/50] Train Acc: 15.55% | Val Acc: 21.20% | LR: 0.001000
Epoch 2/50 [Train]: 100%  250/250 [00:43<00:00, 8.17batch/s, loss=1.94]
Epoch [2/50] Train Acc: 20.89% | Val Acc: 27.70% | LR: 0.001000
Epoch 3/50 [Train]: 100%  250/250 [00:43<00:00, 7.21batch/s, loss=1.82]
Epoch [3/50] Train Acc: 24.11% | Val Acc: 29.75% | LR: 0.001000
Epoch 4/50 [Train]: 100%  250/250 [00:43<00:00, 6.61batch/s, loss=2]
Epoch [4/50] Train Acc: 25.93% | Val Acc: 36.55% | LR: 0.001000
Epoch 5/50 [Train]: 100%  250/250 [00:43<00:00, 7.16batch/s, loss=1.94]
Epoch [5/50] Train Acc: 29.21% | Val Acc: 40.75% | LR: 0.001000
Epoch 6/50 [Train]: 100%  250/250 [00:45<00:00, 5.81batch/s, loss=1.97]
Epoch [6/50] Train Acc: 30.43% | Val Acc: 39.20% | LR: 0.001000
Epoch 7/50 [Train]: 100%  250/250 [00:43<00:00, 7.03batch/s, loss=2.27]
Epoch [7/50] Train Acc: 32.24% | Val Acc: 37.30% | LR: 0.001000
Epoch 8/50 [Train]: 100%  250/250 [00:43<00:00, 5.44batch/s, loss=1.86]
Epoch [8/50] Train Acc: 34.20% | Val Acc: 43.80% | LR: 0.001000
Epoch 9/50 [Train]: 100%  250/250 [00:43<00:00, 7.85batch/s, loss=2.08]
Epoch [9/50] Train Acc: 35.16% | Val Acc: 46.15% | LR: 0.001000
Epoch 10/50 [Train]: 100%  250/250 [00:43<00:00, 5.12batch/s, loss=1.78]
Epoch [10/50] Train Acc: 36.79% | Val Acc: 46.85% | LR: 0.001000
Epoch 11/50 [Train]: 100%  250/250 [00:45<00:00, 7.94batch/s, loss=1.5]
Epoch [11/50] Train Acc: 38.01% | Val Acc: 50.75% | LR: 0.001000
Epoch 12/50 [Train]: 100%  250/250 [00:43<00:00, 6.80batch/s, loss=1.51]
Epoch [12/50] Train Acc: 40.48% | Val Acc: 51.45% | LR: 0.001000
Epoch 13/50 [Train]: 100%  250/250 [00:45<00:00, 6.55batch/s, loss=1.7]
Epoch [13/50] Train Acc: 41.86% | Val Acc: 52.15% | LR: 0.001000
Epoch 14/50 [Train]: 100%  250/250 [00:51<00:00, 6.04batch/s, loss=1.56]
Epoch [14/50] Train Acc: 43.26% | Val Acc: 52.80% | LR: 0.001000
Epoch 15/50 [Train]: 100%  250/250 [00:46<00:00, 7.80batch/s, loss=1.32]
```

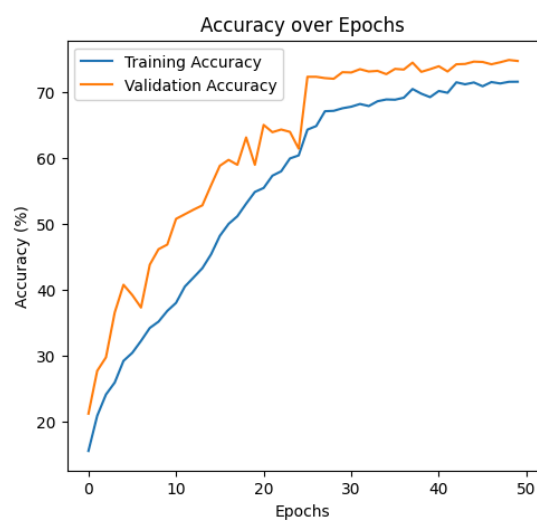
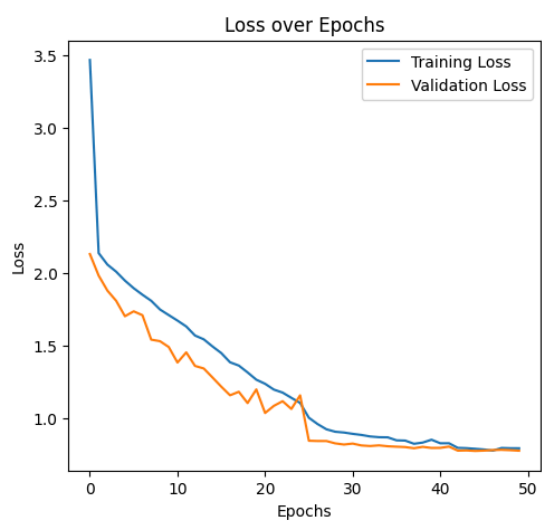


```

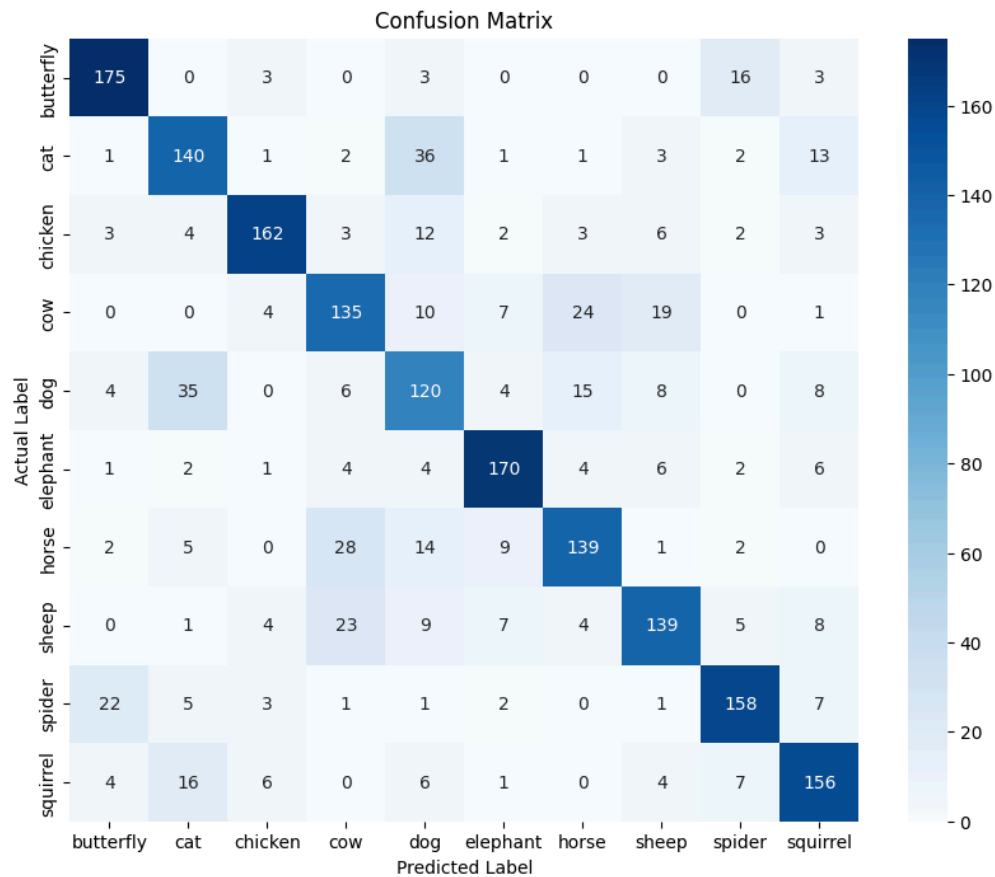
Epoch 45/50 [Train]: 100% ██████████ 250/250 [00:45<00:00, 4.88batch/s, loss=0.859]
Epoch [45/50] Train Acc: 71.44% | Val Acc: 74.60% | LR: 0.000010
Epoch 46/50 [Train]: 100% ██████████ 250/250 [00:44<00:00, 6.50batch/s, loss=0.911]
Epoch [46/50] Train Acc: 70.86% | Val Acc: 74.55% | LR: 0.000010
Epoch 47/50 [Train]: 100% ██████████ 250/250 [00:43<00:00, 7.50batch/s, loss=0.984]
Epoch [47/50] Train Acc: 71.50% | Val Acc: 74.20% | LR: 0.000010
Epoch 48/50 [Train]: 100% ██████████ 250/250 [00:43<00:00, 7.81batch/s, loss=1.15]
Epoch [48/50] Train Acc: 71.29% | Val Acc: 74.50% | LR: 0.000010
Epoch 49/50 [Train]: 100% ██████████ 250/250 [00:43<00:00, 7.43batch/s, loss=0.873]
Epoch [49/50] Train Acc: 71.54% | Val Acc: 74.85% | LR: 0.000010
Epoch 50/50 [Train]: 100% ██████████ 250/250 [00:44<00:00, 7.34batch/s, loss=0.767]
Epoch [50/50] Train Acc: 71.55% | Val Acc: 74.70% | LR: 0.000010
Training Complete!

```

4.1 Loss and Accuracy Plots



4.3 Confusion Matrix (testing my hypothesis)



```

--- Classification Report ---
              precision    recall  f1-score   support

 butterfly      0.83      0.88      0.85       200
      cat       0.67      0.70      0.69       200
    chicken     0.88      0.81      0.84       200
      cow       0.67      0.68      0.67       200
      dog       0.56      0.60      0.58       200
    elephant     0.84      0.85      0.84       200
      horse     0.73      0.69      0.71       200
      sheep     0.74      0.69      0.72       200
      spider     0.81      0.79      0.80       200
     squirrel   0.76      0.78      0.77       200

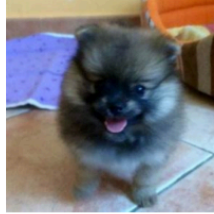
 accuracy              0.75              2000
 macro avg              0.75              2000
 weighted avg              0.75              2000
  
```

4.4 Fun Visual Check of misclassified dogs

True: dog
Pred: cat



True: dog
Pred: cat



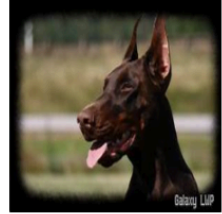
True: dog
Pred: cat



True: dog
Pred: cat

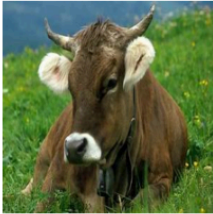


True: dog
Pred: cat

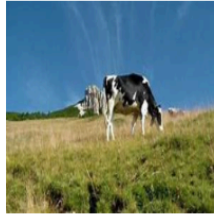


4.5 Visually check other animals (sheep, cow, horse, butterfly)

True: cow
Pred: sheep



True: cow
Pred: sheep



True: cow
Pred: sheep



True: cow
Pred: sheep



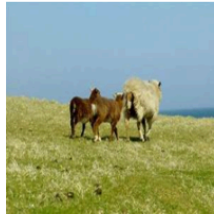
True: cow
Pred: sheep



True: sheep
Pred: cow



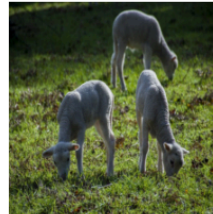
True: sheep
Pred: cow



True: sheep
Pred: cow



True: sheep
Pred: cow



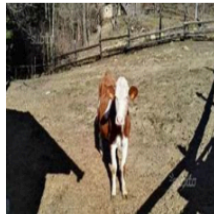
True: sheep
Pred: cow



True: cow
Pred: horse



True: cow
Pred: horse



True: cow
Pred: horse



True: cow
Pred: horse



True: cow
Pred: horse



True: spider
Pred: butterfly



True: spider
Pred: butterfly



True: spider
Pred: butterfly



True: spider
Pred: butterfly



True: spider
Pred: butterfly

