Animal_Classification-data-aug

June 10, 2024

1 Data Augmentation

From the previous model, we have changed the data augmentation into the model with the aim to make the model more general.

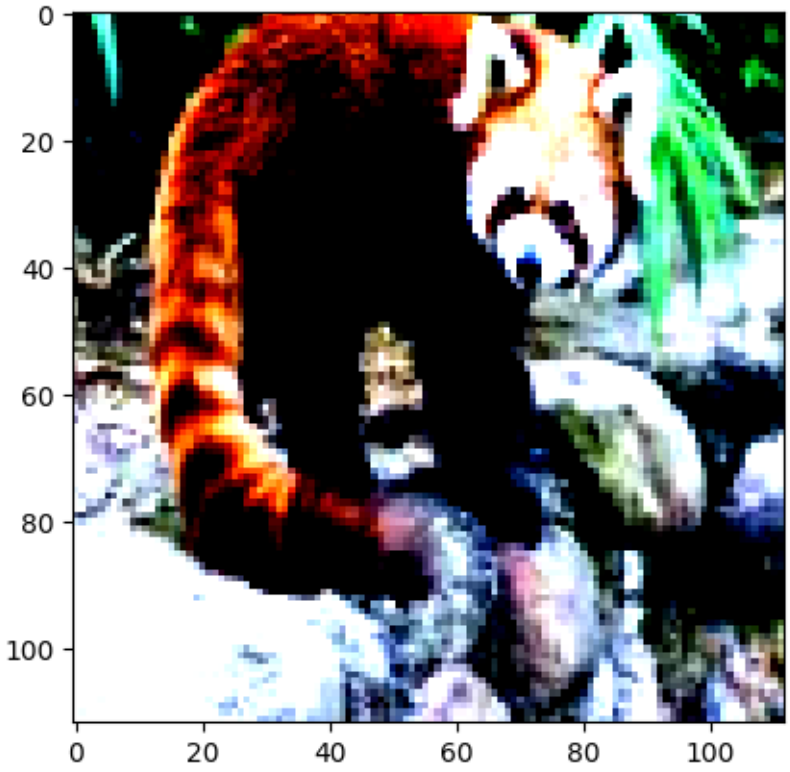
Validation Loss: 3.689 Validation Accuracy: 36.61% FLOPS: 0.69G

```
Size of training dataset : 6270
```

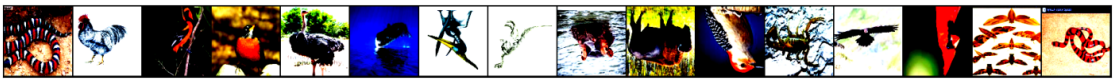
```
torch.Size([3, 112, 112])
```

```
Clipping input data to the valid range for imshow with RGB data ([0..1] for
floats or [0..255] for integers).
```

```
Label:  ailurus-fulgens (5)
```

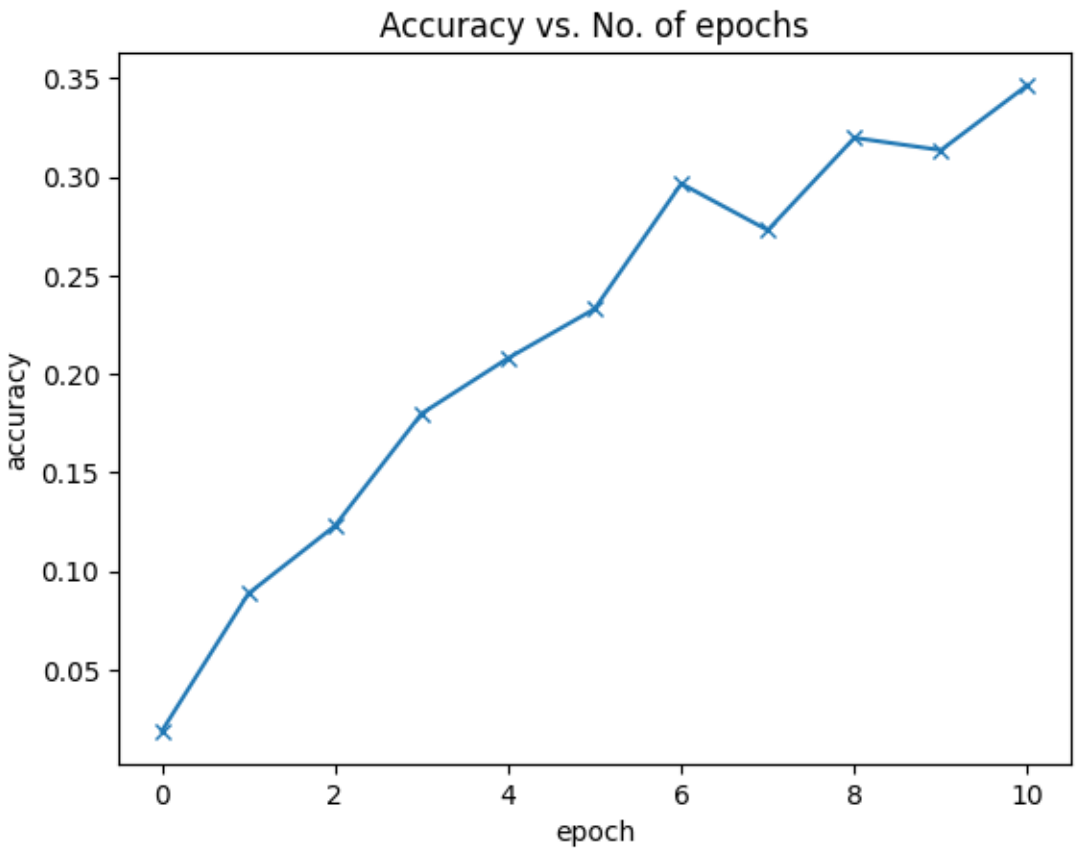


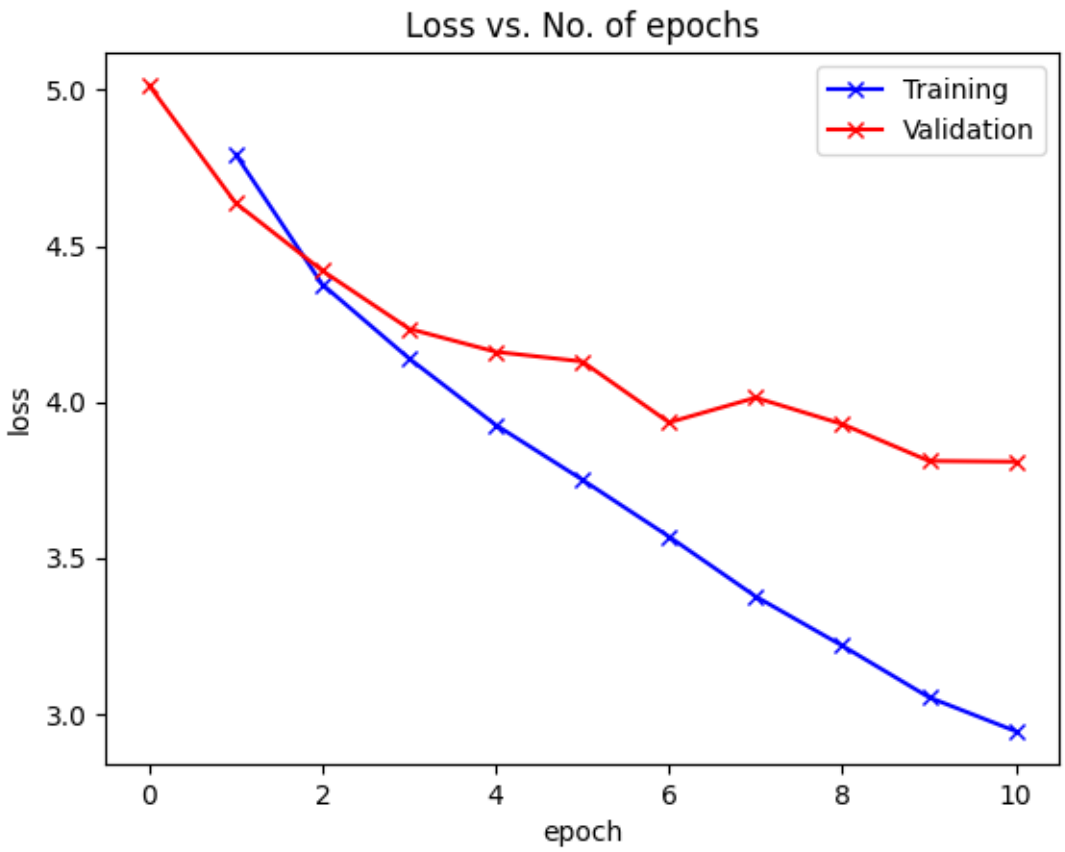
```
(5330, 313, 627)

Clipping input data to the valid range for imshow with RGB data ([0..1] for
floats or [0..255] for integers).
```



```
ConvolutionalNetwork(
  (conv1): Conv2d(3, 64, kernel_size=(5, 5), stride=(1, 1))
  (conv2): Conv2d(64, 128, kernel_size=(3, 3), stride=(1, 1))
  (conv3): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1))
  (conv4): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1))
  (fc1): Linear(in_features=3200, out_features=151, bias=True)
)

images.shape: torch.Size([16, 3, 112, 112])
out.shape: torch.Size([16, 151])
out[0]: tensor([-5.0405, -5.0069, -4.9499, -5.0707, -5.0757, -5.0082, -4.9831,
-4.9833,
        -5.0559, -5.0269, -5.0913, -4.9888, -4.9934, -5.0182, -5.0519, -5.0426,
        -5.0444, -5.0217, -5.0342, -5.0866, -5.0165, -5.0140, -5.0279, -4.9752,
        -5.0075, -4.9683, -4.9756, -5.0821, -5.0339, -4.9775, -4.9766, -5.0211,
        -5.0789, -5.0153, -5.0031, -5.0059, -5.0231, -4.9917, -4.8929, -5.0270,
        -5.0481, -5.0200, -5.0160, -5.0715, -4.9473, -5.0549, -5.0045, -5.0938,
        -4.9971, -5.0012, -5.0303, -5.0332, -4.9954, -5.0794, -5.0283, -5.0726,
        -5.0624, -5.0386, -5.0130, -4.9753, -5.0669, -5.0276, -5.0438, -5.0435,
        -5.0622, -4.9776, -5.0274, -5.0404, -5.0266, -5.0178, -5.0310, -5.0147,
        -5.0273, -5.0788, -5.0491, -5.0703, -5.0287, -4.9993, -5.0185, -4.9626,
        -5.0880, -5.0043, -5.0573, -4.9818, -4.9979, -4.9563, -5.0507, -5.0166,
        -5.0372, -5.0336, -5.0458, -5.0125, -5.0072, -4.9287, -5.0209, -5.0372,
        -5.0294, -5.0109, -5.0749, -5.0774, -5.0551, -5.0230, -4.9546, -5.0355,
        -4.9514, -5.0215, -5.0329, -5.0142, -4.9523, -5.0537, -5.0671, -5.0318,
        -5.0894, -5.0019, -5.0205, -5.0277, -4.9608, -4.9479, -4.9819, -5.0188,
        -5.0346, -5.0617, -5.0043, -4.9750, -5.0060, -4.9762, -4.9555, -5.0211,
        -4.9650, -5.0130, -4.9971, -4.9691, -5.0214, -4.9848, -5.0402, -5.0176,
        -5.0021, -5.0755, -5.0118, -5.0288, -5.0153, -4.9983, -5.0189, -4.9564,
        -4.9752, -4.9709, -4.9840, -5.0463, -4.9700, -5.0691, -4.9562],
       device='cuda:0', grad_fn=<SelectBackward0>)

ConvolutionalNetwork(
  (conv1): Conv2d(3, 64, kernel_size=(5, 5), stride=(1, 1))
  (conv2): Conv2d(64, 128, kernel_size=(3, 3), stride=(1, 1))
  (conv3): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1))
  (conv4): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1))
```

```
  (fc1): Linear(in_features=3200, out_features=151, bias=True)
)

[{'val_loss': 5.015295505523682, 'val_acc': 0.01875000074505806}]

627

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [0], train_loss: 4.7936, val_loss: 4.6374, val_acc: 0.0885

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [1], train_loss: 4.3765, val_loss: 4.4203, val_acc: 0.1229

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [2], train_loss: 4.1393, val_loss: 4.2343, val_acc: 0.1799

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [3], train_loss: 3.9262, val_loss: 4.1602, val_acc: 0.2080

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [4], train_loss: 3.7502, val_loss: 4.1291, val_acc: 0.2330

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [5], train_loss: 3.5679, val_loss: 3.9339, val_acc: 0.2965

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [6], train_loss: 3.3759, val_loss: 4.0132, val_acc: 0.2729

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [7], train_loss: 3.2179, val_loss: 3.9284, val_acc: 0.3198

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [8], train_loss: 3.0526, val_loss: 3.8104, val_acc: 0.3135

  0%|          | 0/334 [00:00<?, ?it/s]

Epoch [9], train_loss: 2.9439, val_loss: 3.8080, val_acc: 0.3465
```


Accuracy vs. No. of epochs
accuracy
epoch
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
2
4
6
8
10




```
{'val_loss': 3.688917875289917, 'val_acc': 0.3661458492279053}
```

1.1 FLOPs

```
+ Number of FLOPs: 0.69G
```