Animal_Classification-activation

June 10, 2024

1 Changing Activation Function

From the previous model, we have changed the activiation function from relu to elu.

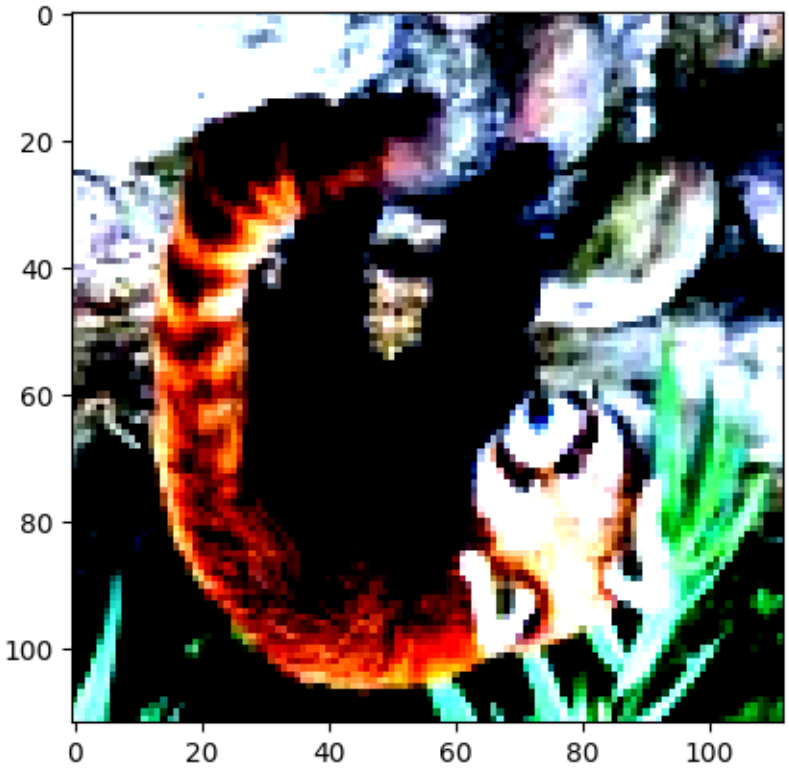
Validation Loss: 3.429 Validation Accuracy: 48.80% FLOPS: 0.69G

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

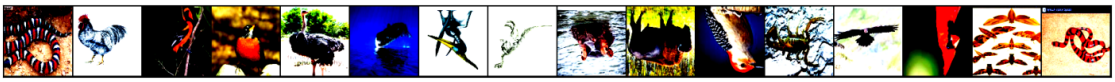
```
torch.Size([3, 112, 112])
```

```
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)
```



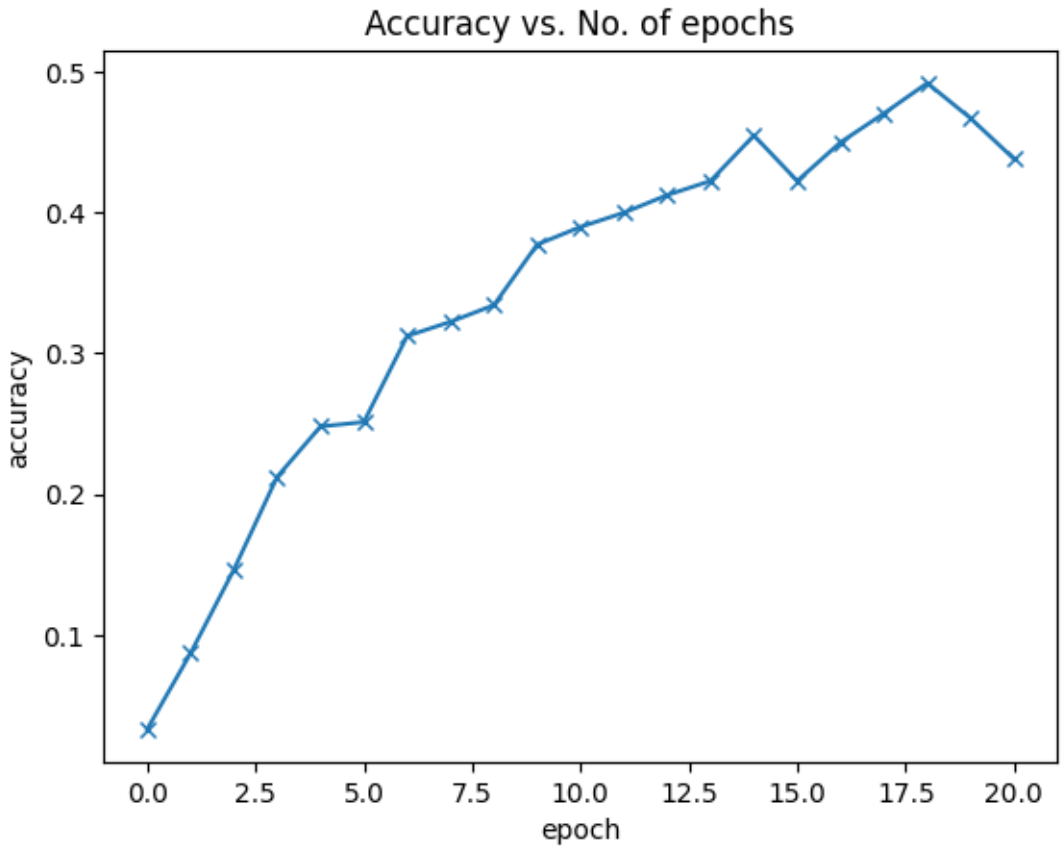
```
(5330, 313, 627)

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

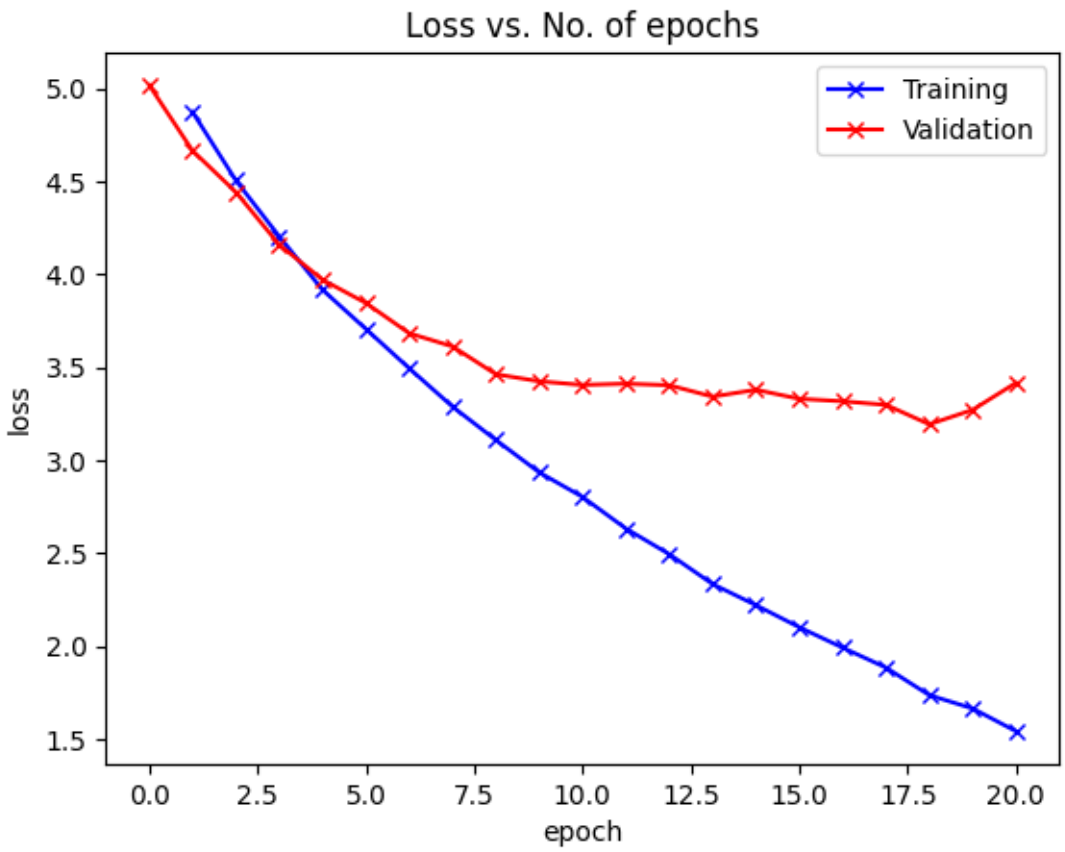


```
ConvolutionalNetwork(
  (conv1): Conv2d(3, 64, kernel_size=(5, 5), stride=(1, 1))
  (conv2): Conv2d(64, 128, kernel_size=(3, 3), stride=(1, 1))
  (conv3): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1))
  (conv4): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1))
  (fc1): Linear(in_features=3200,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

images.shape: torch.Size([16, 3, 112, 112])
out.shape: torch.Size([16, 151])
out[0]: tensor([-5.0489, -5.0781, -4.9266, -5.1204, -5.0625, -5.0855, -4.9174,
-4.9842,
        -5.1094, -5.0609, -5.1220, -5.0109, -4.9250, -5.0083, -5.0407, -5.1288,
        -5.0546, -5.0991, -5.0241, -5.1131, -5.0059, -5.0717, -5.0266, -4.9116,
        -5.0760, -4.9464, -5.0019, -5.1417, -5.0238, -4.9832, -5.0143, -4.9214,
        -5.0793, -5.0900, -4.9990, -4.9707, -4.9987, -4.9166, -4.8067, -5.0662,
        -5.0293, -5.0226, -4.9846, -5.0890, -4.8706, -5.0841, -5.0358, -5.0542,
        -5.0192, -5.0265, -5.0231, -5.0679, -5.0016, -5.0581, -5.0925, -5.0918,
        -5.0381, -5.0127, -5.0724, -4.9524, -5.1009, -5.0825, -5.0414, -5.0108,
        -5.1328, -5.0444, -4.9628, -5.0557, -5.0541, -5.0662, -5.0348, -4.9805,
        -5.0027, -5.0458, -5.1196, -5.0853, -5.0458, -5.0245, -4.9233, -4.9343,
        -5.1627, -4.9826, -5.0540, -5.0019, -4.9863, -4.9165, -5.0167, -4.9963,
        -5.0581, -5.0338, -5.0931, -4.9972, -4.9782, -4.8560, -4.9929, -4.9815,
        -5.0214, -5.0012, -5.0680, -5.1028, -5.1095, -5.0180, -4.9250, -5.0122,
        -4.9136, -5.0391, -5.0391, -5.0373, -4.8550, -5.0919, -5.1288, -4.9897,
        -5.2032, -4.9982, -5.0336, -5.0183, -4.9084, -4.9526, -4.9259, -5.1717,
        -5.0815, -5.0431, -5.0133, -4.9156, -5.0519, -4.9967, -4.9056, -4.9836,
        -4.9027, -4.9574, -5.0047, -5.0021, -5.0542, -5.0065, -5.0082, -5.0182,
        -4.9585, -5.1772, -5.0208, -5.0635, -5.1108, -4.9964, -5.0044, -4.8936,
        -4.9402, -4.9707, -4.9313, -5.0254, -4.9108, -5.0988, -4.9118],
       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': 5.017691135406494, 'val_acc': 0.0329861119389534}]

627

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

Epoch [0], train_loss: 4.8735, val_loss: 4.6650, val_acc: 0.0868

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

Epoch [1], train_loss: 4.5052, val_loss: 4.4427, val_acc: 0.1462

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

Epoch [2], train_loss: 4.2044, val_loss: 4.1597, val_acc: 0.2122

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

Epoch [3], train_loss: 3.9166, val_loss: 3.9708, val_acc: 0.2479

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

Epoch [4], train_loss: 3.7063, val_loss: 3.8459, val_acc: 0.2510

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

Epoch [5], train_loss: 3.4947, val_loss: 3.6830, val_acc: 0.3122

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

Epoch [6], train_loss: 3.2883, val_loss: 3.6121, val_acc: 0.3222

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

Epoch [7], train_loss: 3.1090, val_loss: 3.4627, val_acc: 0.3340

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

Epoch [8], train_loss: 2.9350, val_loss: 3.4247, val_acc: 0.3771

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

Epoch [9], train_loss: 2.8027, val_loss: 3.4052, val_acc: 0.3896

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

Epoch [10], train_loss: 2.6328, val_loss: 3.4121, val_acc: 0.3997

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

Epoch [11], train_loss: 2.4950, val_loss: 3.4036, val_acc: 0.4122

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

Epoch [12], train_loss: 2.3345, val_loss: 3.3422, val_acc: 0.4222

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

Epoch [13], train_loss: 2.2208, val_loss: 3.3792, val_acc: 0.4545
```

```
  0%|          | 0/334 [00:00<?, ?it/s]
Epoch [14], train_loss: 2.1022, val_loss: 3.3305, val_acc: 0.4222
  0%|          | 0/334 [00:00<?, ?it/s]
Epoch [15], train_loss: 1.9924, val_loss: 3.3173, val_acc: 0.4497
  0%|          | 0/334 [00:00<?, ?it/s]
Epoch [16], train_loss: 1.8851, val_loss: 3.2981, val_acc: 0.4701
  0%|          | 0/334 [00:00<?, ?it/s]
Epoch [17], train_loss: 1.7369, val_loss: 3.1934, val_acc: 0.4917
  0%|          | 0/334 [00:00<?, ?it/s]
Epoch [18], train_loss: 1.6652, val_loss: 3.2711, val_acc: 0.4667
  0%|          | 0/334 [00:00<?, ?it/s]
Epoch [19], train_loss: 1.5429, val_loss: 3.4164, val_acc: 0.4378
```






```
{'val_loss': 3.429217576980591, 'val_acc': 0.4880208671092987}
```

1.1 FLOPs

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