

# Results

Training Dataset :5000 images of each class.

Validation Dataset : 1000 images of each class

Test Dataset : 8000/1000 images of damaged/undamaged classes

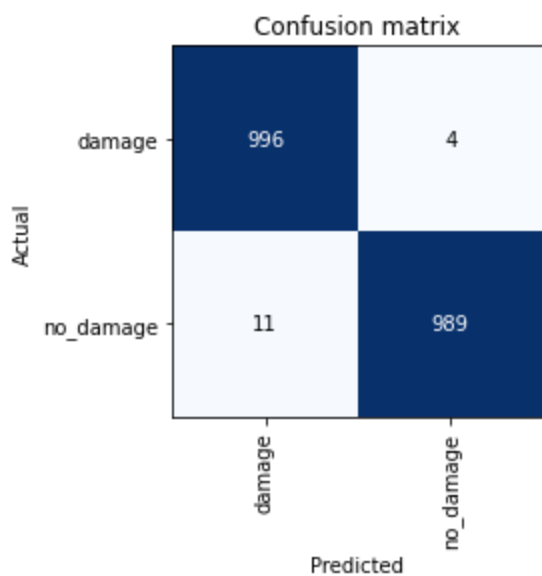
Here's a batch of our training images with their respective labels on top of each image:



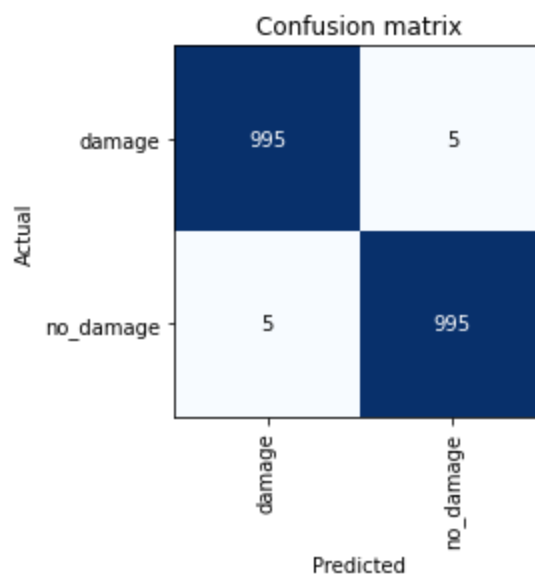
## Model 1: Transfer learning with resnet34

- Weights for Initial Layers of CNN were kept fixed and the last 2 layers were trained.
- 25 epochs
- **Validation Accuracy = 99.2%**
- **Test Accuracy of 99.5%**
- Learning Rate =0.03

## Validation Set



## Test Set



## Prediction/Actual/Loss/Probability

damage/no\_damage / 5.32 / 0.00



damage/no\_damage / 4.61 / 0.01



no\_damage/damage / 4.43 / 0.01



damage/no\_damage / 2.92 / 0.05



damage/no\_damage / 2.32 / 0.10



damage/no\_damage / 1.41 / 0.25



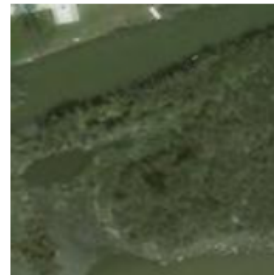
no\_damage/damage / 1.37 / 0.25



damage/no\_damage / 1.31 / 0.27



damage/no\_damage / 1.22 / 0.29



**Out of test validation accuracy(9000 images) = 99.04%**

Out of test confusion matrix =

Confusion matrix

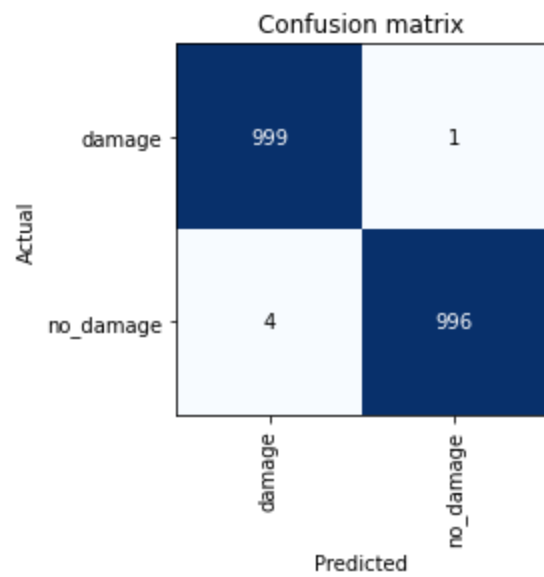
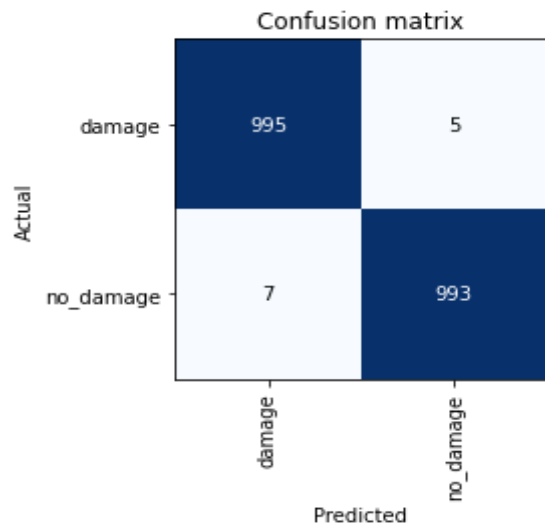
| Actual    | damage | no_damage |           |
|-----------|--------|-----------|-----------|
|           | 7922   | 78        |           |
| no_damage | 8      | 992       |           |
| Predicted |        |           |           |
|           |        | damage    | no_damage |

**Model 2: Transfer learning with resnet34 => Unfreezing the initial layers**

- Weights were unfrozen for initial layers and these layers were also trained by the learning rate found using max\_lr\_finder.
- Epoch = 10
- max\_lr=slice( $10^{-6}$ ,  $3 \times 10^{-3}$ )
- **Validation Accuracy = 99.4%**
- **Test Accuracy = 99.75%**

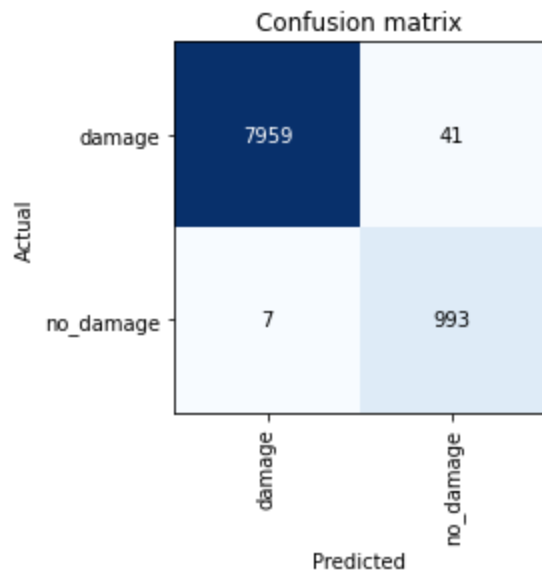
**Validation Set**

**Test Set**



**Out of test validation accuracy(8000 + 1000 images) = 99.47%**

Out of test confusion matrix =



**Prediction/Actual/Loss/Probability**

damage/no\_damage / 11.82 / 0.00



damage/no\_damage / 10.50 / 0.00



damage/no\_damage / 7.95 / 0.00



no\_damage/damage / 5.46 / 0.00



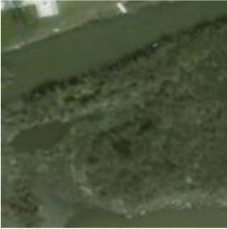
damage/no\_damage / 4.11 / 0.02



no\_damage/damage / 3.97 / 0.02



damage/no\_damage / 3.40 / 0.03



damage/no\_damage / 2.43 / 0.09



no\_damage/damage / 2.42 / 0.09

