MACHINE
LEARNING

mobilenetV2 with noised data set

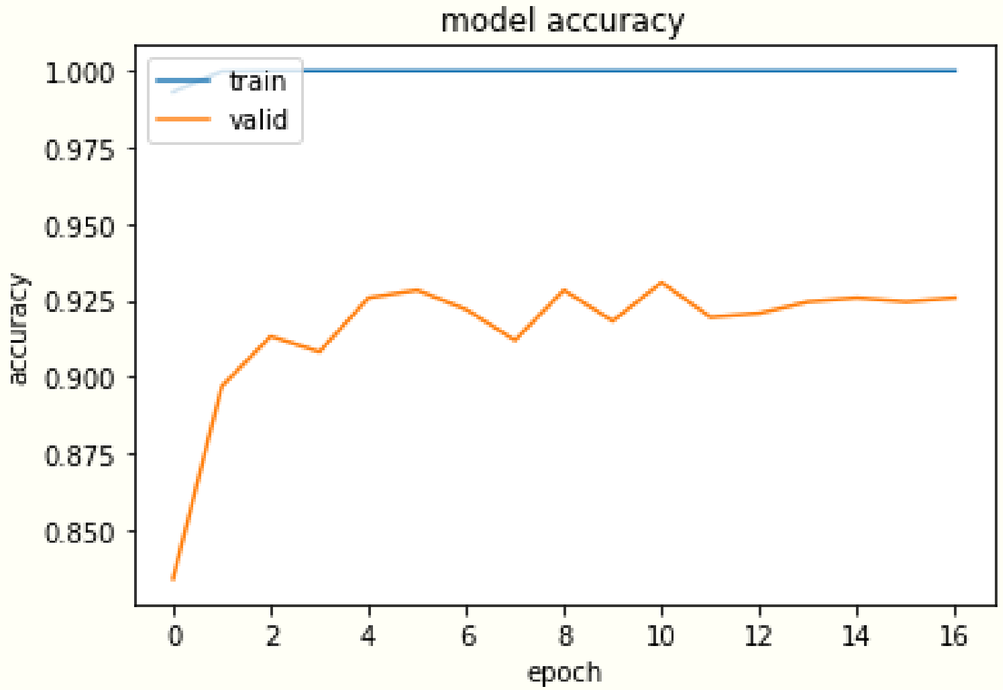
plant disease classification using leaf images

we tested the performance of the model in two cases

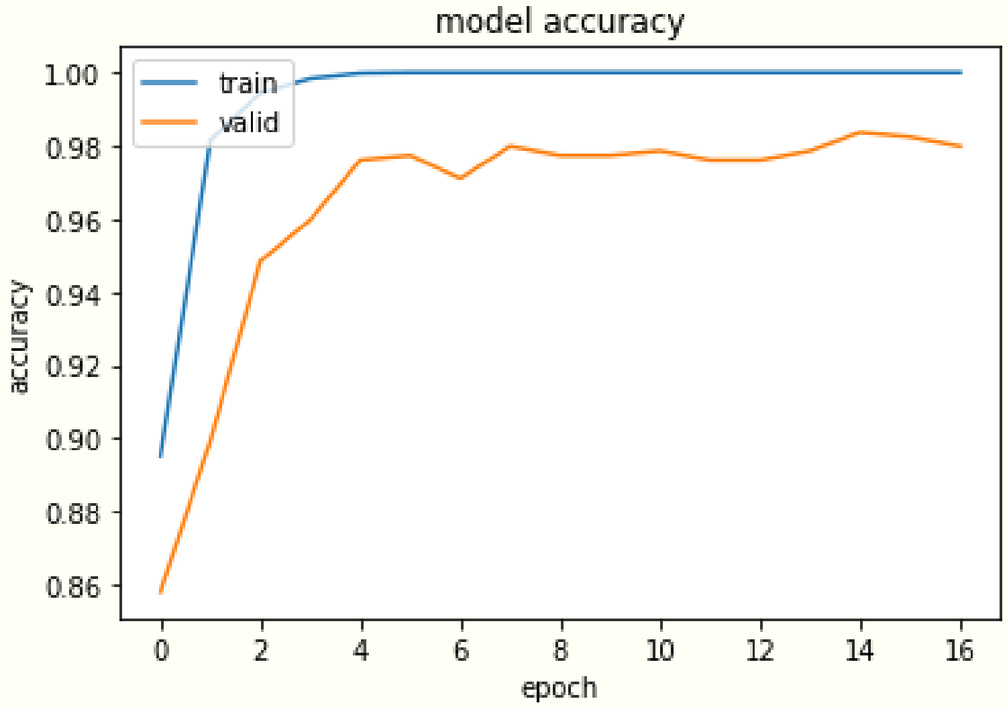
1. Trained the model using original image data set without noise in it

2. Trained the model using original image data set with different levels of noise (including 0 level) in it

1. Accuracy of the model

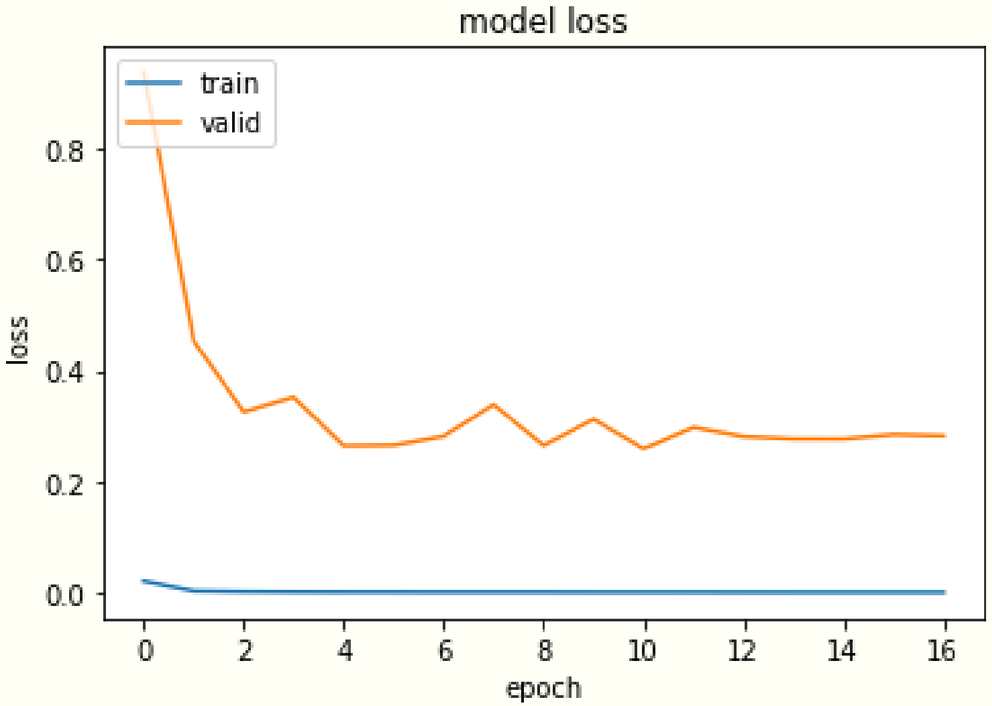


without noise

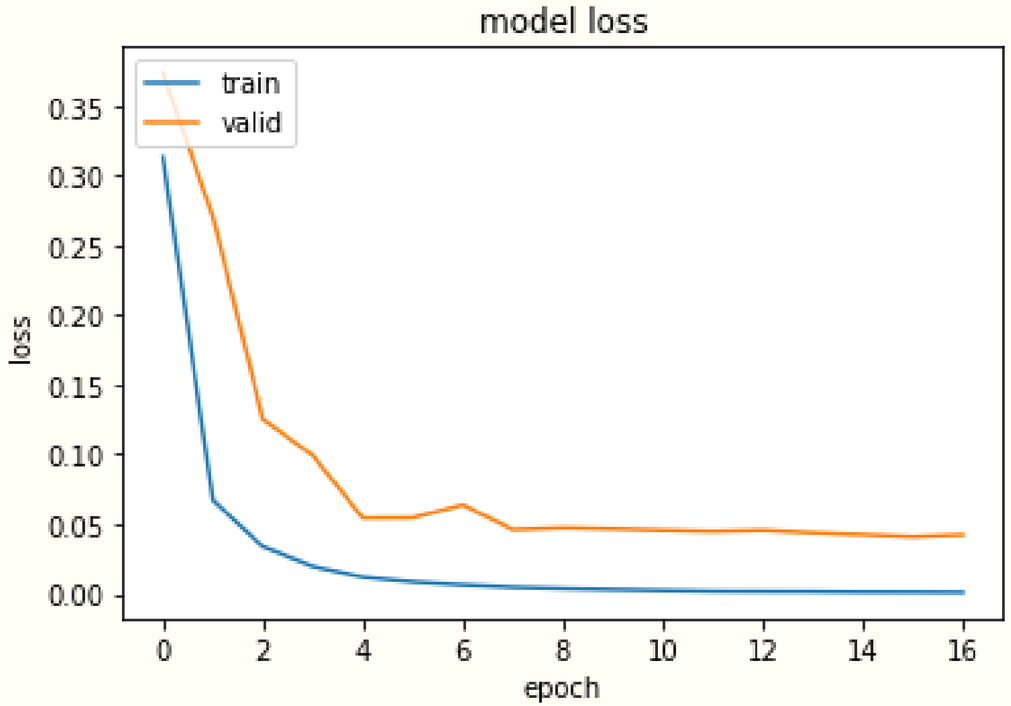


with noise

2. Loss of the model

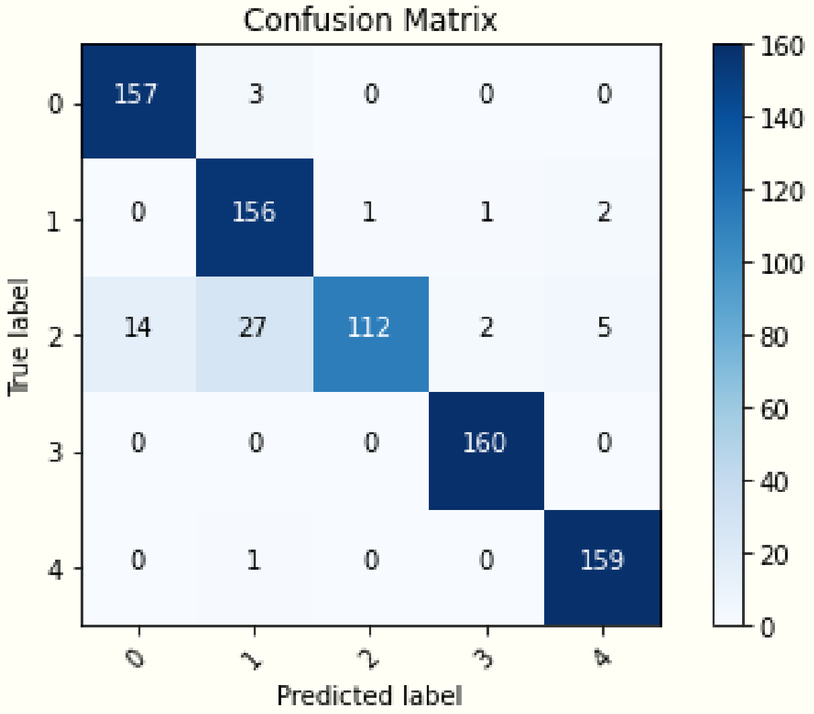


without noise

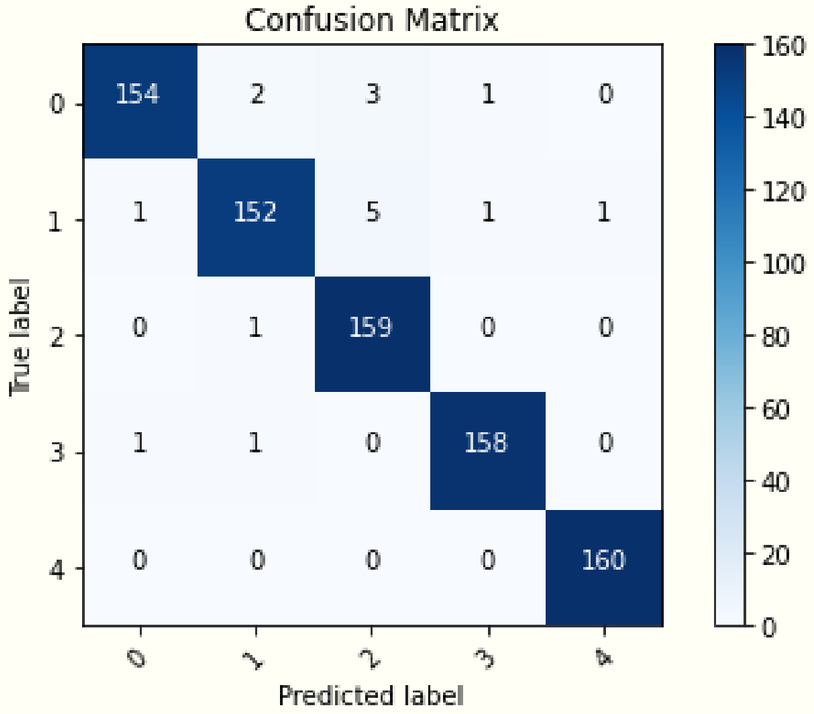


with noise

3. Confusion matrix of the model



without noise



with noise

4.. Final report of the model

	precision	recall	f1-score	support
0	0.92	0.98	0.95	160
1	0.83	0.97	0.90	160
2	0.99	0.70	0.82	160
3	0.98	1.00	0.99	160
4	0.96	0.99	0.98	160
accuracy			0.93	800
macro avg	0.94	0.93	0.93	800
weighted avg	0.94	0.93	0.93	800

without noise

	precision	recall	f1-score	support
0	0.99	0.96	0.97	160
1	0.97	0.95	0.96	160
2	0.95	0.99	0.97	160
3	0.99	0.99	0.99	160
4	0.99	1.00	1.00	160
accuracy			0.98	800
macro avg	0.98	0.98	0.98	800
weighted avg	0.98	0.98	0.98	800

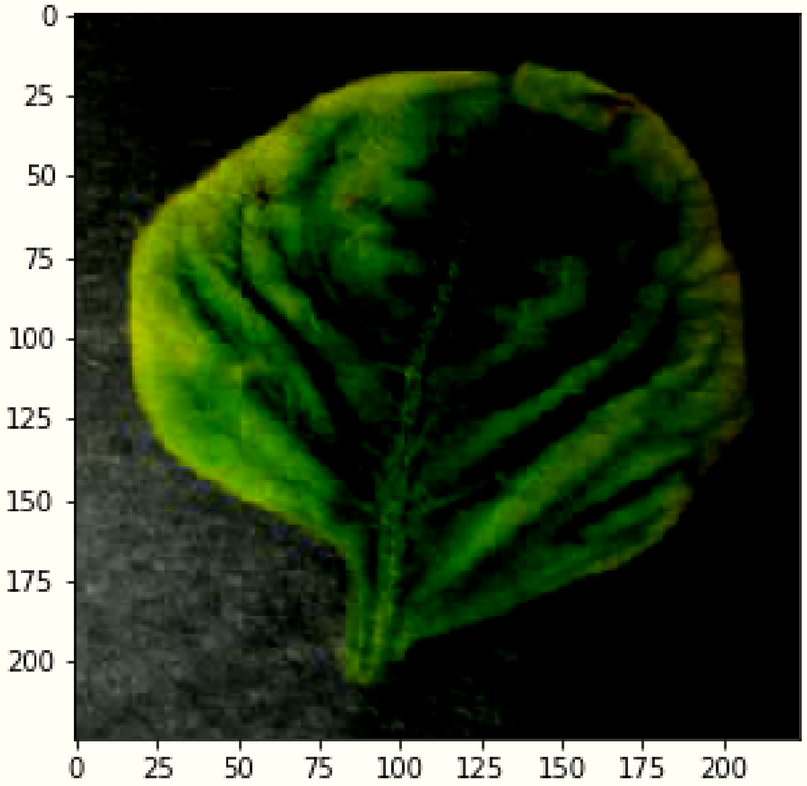
with noise

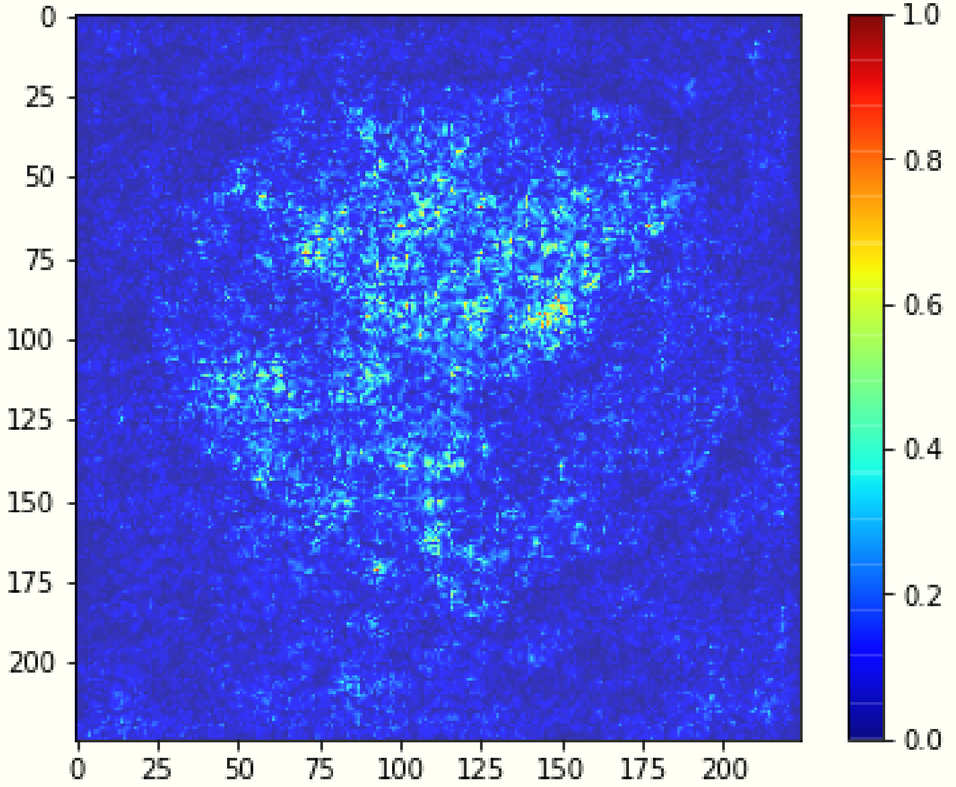
Conclusion

So according to the test, when the modelis trained with different noise level data set the model will perform better

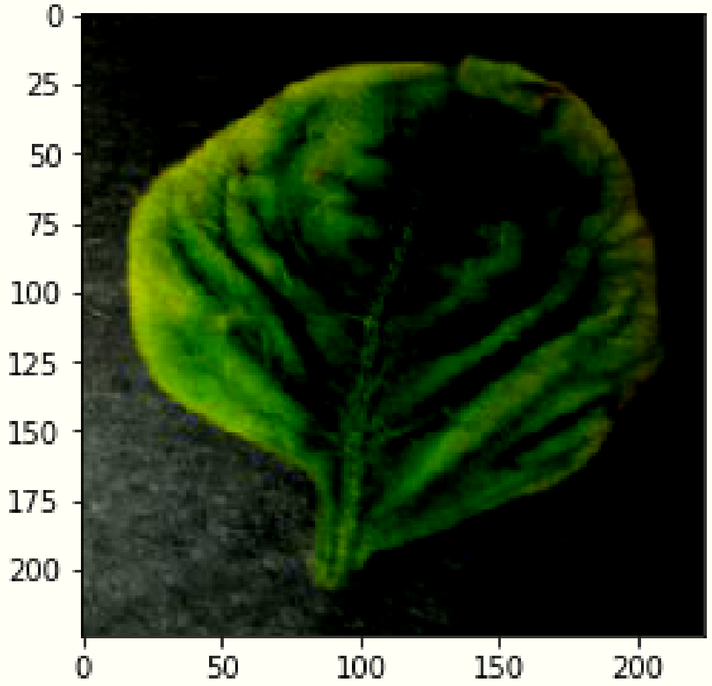
Saliency Maps

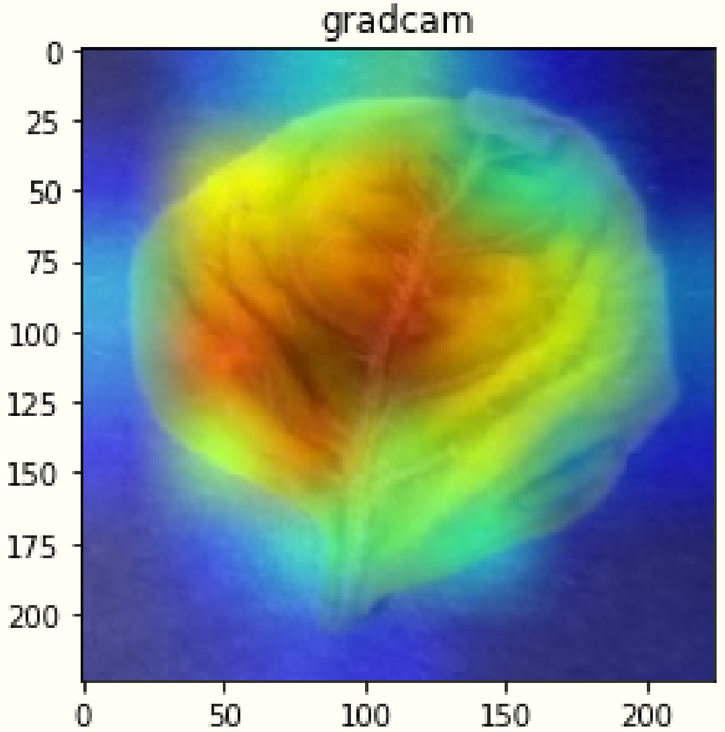
Vanila saliency map



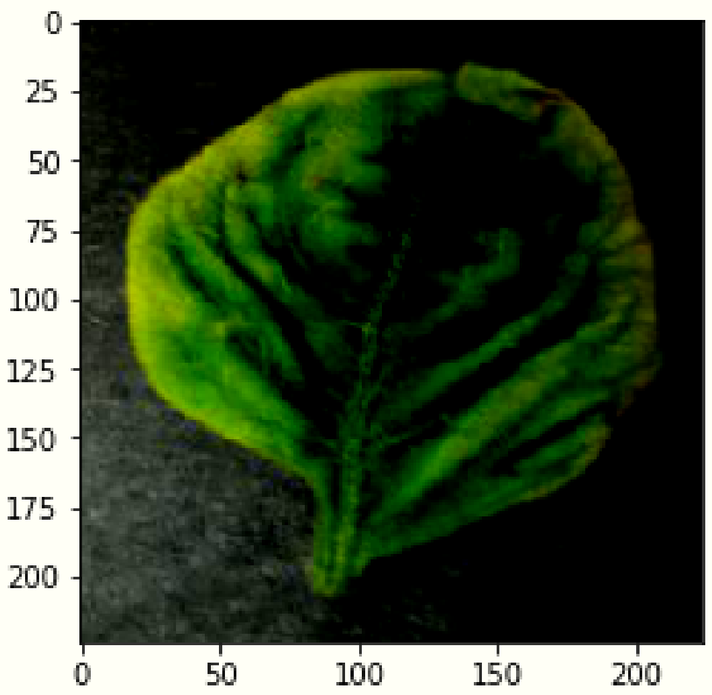


Grad-Cam


0
25
50
75
100
125
150
175
200
0
50
100
150
200


gradcam
0
25
50
75
100
125
150
175
200
0
50
100
150
200

Grad-Cam ++


0
25
50
75
100
125
150
175
200
0
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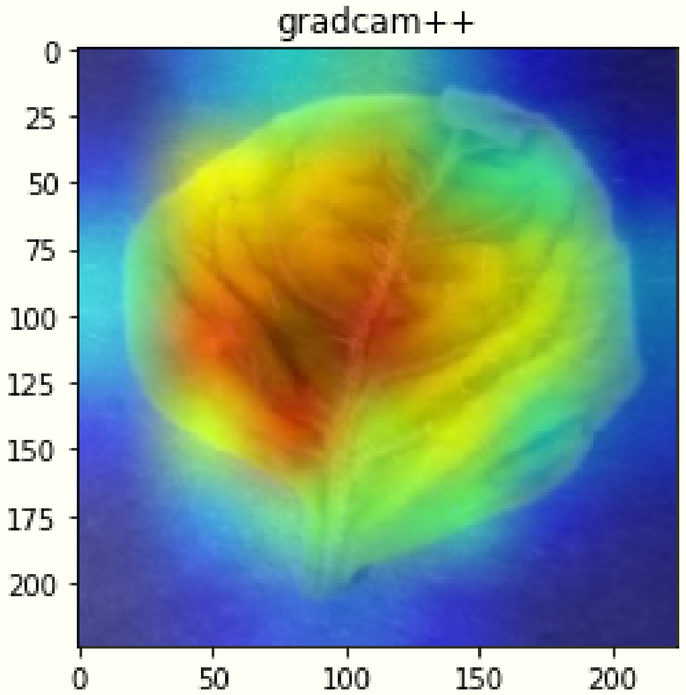
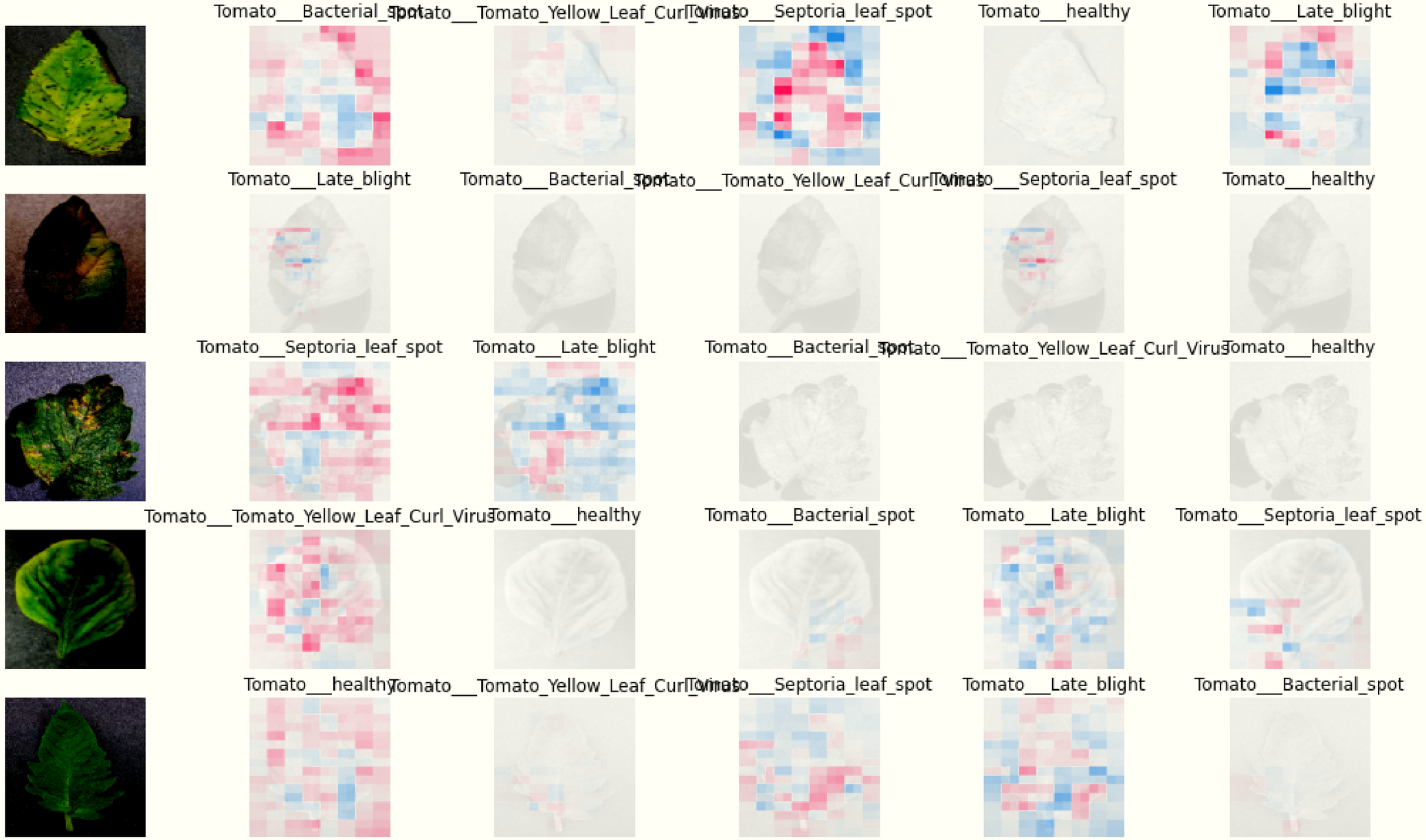

gradcam++
0
25
50
75
100
125
150
175
200
0
50
100
150
200

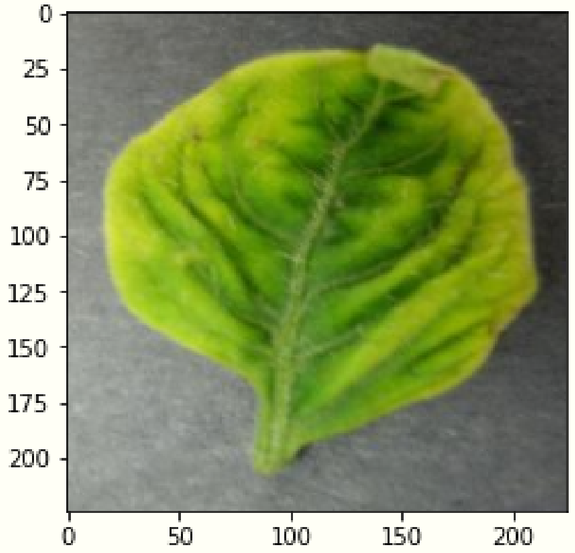
Shap image explainer

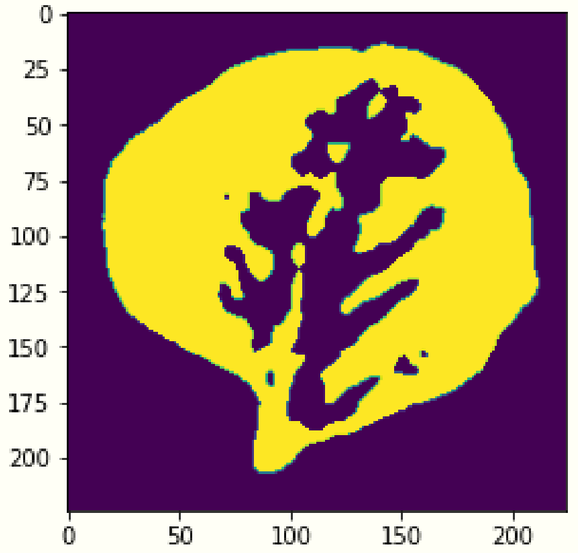


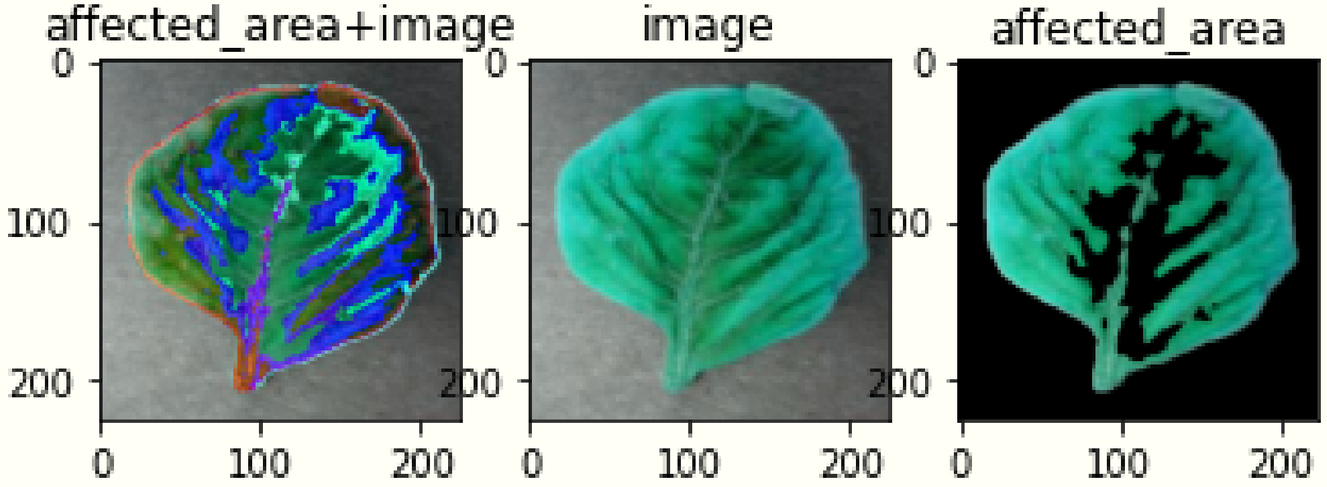
Performance of model explainers

1. **Image is taken and the affected area of the image is separated and thresholded.**

2. **the weighted average is calculated**







Result

```
saliency map weighted_average  :     46.22%
gradcam weighted_average       :     54.69%
gradcam++ weighted_average     :     54.33%
shap weighted_average          :     58.20%
```

Conclusion

Shap image explainer is performing better than others.

Thankyou!