

Augmentation Method	CNN_Bsed Model	Accuracy	Loss
Cycle GAN	DenseNet121	0.9024389982223511	0.23910222947597504
	ResNet50V2	0.9268292784690857	0.24006755650043488
	DenseNet169	0.8658536672592163	0.3402628004550934
	Xception	0.8292682766914368	0.35331150889396678
	MobileNetV2	0.9024389982223511	0.20936338603496552
	ResNet152V2	0.9024389982223511	0.20936338603496552
ADASYN	DenseNet121	0.9785	0.0422
	ResNet50V2	0.9573	0.1306
	DenseNet169	0.9577	0.0878
	Xception	0.9577	0.1340
	MobileNetV2	0.9150	0.1541
	ResNet152V2	0.9681	0.1022
SMOTE	DenseNet121	0.9785	0.0427
	ResNet50V2	0.9362	0.0972
	DenseNet169	0.9577	0.1091
	Xception	0.9788	0.1208
	MobileNetV2	0.9150	0.1649
	ResNet152V2	0.9462	0.1401
	DenseNet121	0.9892	0.0630
	ResNet50V2	0.9362	0.1118

SMOTETOMek	DenseNet169	0.9577	0.1083
	Xception	0.9788	0.1260
	MobileNetV2	0.9362	0.1194
	ResNet152V2	0.9466	0.1320
No Augmenation	DenseNet121		
	ResNet50V2		
	DenseNet169		
	Xception		
	MobileNetV2		
	ResNet152V2		

### ADASYN:

CNN architecture	Test Accuracy	Confusion Matrix
MobileNetV2	accuracy: 0.9150 - loss: 0.1541	<pre> Matrice de confusion : [[15  0  3]  [ 0 12  1]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      0.94      0.83      0.88        18  septoria     1.00      0.92      0.96        13  stripe_rust   0.88      0.97      0.92        31   accuracy          0.92        62  macro avg      0.94      0.91      0.92        62  weighted avg   0.92      0.92      0.92        62 </pre>
ResNet50V2	accuracy: 0.9573 - loss: 0.1306	<pre> Matrice de confusion : [[17  0  1]  [ 0 12  1]  [ 0  1 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      1.00      0.94      0.97        18  septoria     0.92      0.92      0.92        13  stripe_rust   0.94      0.97      0.95        31   accuracy          0.95        62  macro avg      0.95      0.95      0.95        62  weighted avg   0.95      0.95      0.95        62 </pre>

ResNet152V2	Currently, ResNet50V2 is available, and there isn't a ResNet52V2 model in the official TensorFlow/Keras applications.	<pre> Matrice de confusion : [[17  0  1]  [ 0 12  1]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support   Healthy      1.00      0.94      0.97        18   septoria      1.00      0.92      0.96        13  stripe_rust    0.94      1.00      0.97        31   accuracy              0.97        62  macro avg              0.98      0.96      0.97        62  weighted avg           0.97      0.97      0.97        62 </pre>
DenseNet121	accuracy: 0.9785 loss: 0.0422	<pre> Matrice de confusion : [[18  0  0]  [ 0 11  2]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support   Healthy      1.00      1.00      1.00        18   septoria      1.00      0.85      0.92        13  stripe_rust    0.94      1.00      0.97        31   accuracy              0.97        62  macro avg              0.98      0.95      0.96        62  weighted avg           0.97      0.97      0.97        62 </pre>
DenseNet169	accuracy: 0.9577 - loss: 0.0878	<pre> Matrice de confusion : [[16  0  2]  [ 0 13  0]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support   Healthy      1.00      0.89      0.94        18   septoria      1.00      1.00      1.00        13  stripe_rust    0.94      1.00      0.97        31   accuracy              0.97        62  macro avg              0.98      0.96      0.97        62  weighted avg           0.97      0.97      0.97        62 </pre>
Xception	accuracy: 0.9577 loss: 0.1340	<pre> Matrice de confusion : [[17  0  1]  [ 0 13  0]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      0.94      0.94      0.94        18   septoria      1.00      1.00      1.00        13  stripe_rust    0.97      0.97      0.97        31   accuracy              0.97        62  macro avg              0.97      0.97      0.97        62  weighted avg           0.97      0.97      0.97        62 </pre>

## SMOTE:

CNN architecture	Test Accuracy	Confusion Matrix
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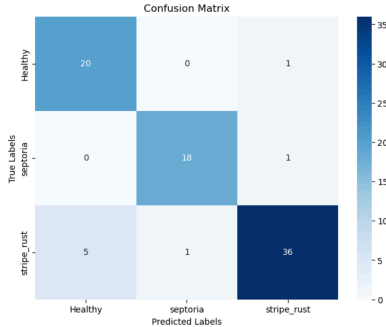
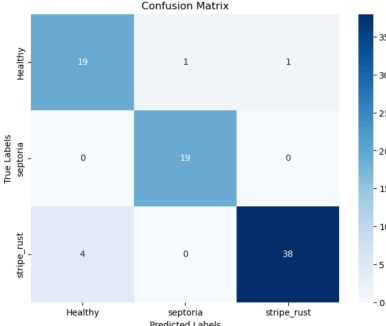
MobileNetV2	accuracy: 0.9150 loss: 0.1649	<pre> Matrice de confusion : [[15  0  3]  [ 0 12  1]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      0.94      0.83      0.88        18  septoria     1.00      0.92      0.96        13  stripe_rust   0.88      0.97      0.92        31   accuracy          0.92        62  macro avg         0.94      0.91      0.92        62  weighted avg      0.92      0.92      0.92        62 </pre>
ResNet50V2	accuracy: 0.9362 loss: 0.0972	<pre> Matrice de confusion : [[16  0  2]  [ 0 12  1]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      0.94      0.89      0.91        18  septoria     1.00      0.92      0.96        13  stripe_rust   0.91      0.97      0.94        31   accuracy          0.94        62  macro avg         0.95      0.93      0.94        62  weighted avg      0.94      0.94      0.94        62 </pre>
ResNet52V2	accuracy: 0.9462 - loss: 0.1401	<pre> Matrice de confusion : [[17  1  0]  [ 0 10  3]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      0.94      0.94      0.94        18  septoria     0.91      0.77      0.83        13  stripe_rust   0.91      0.97      0.94        31   accuracy          0.92        62  macro avg         0.92      0.89      0.91        62  weighted avg      0.92      0.92      0.92        62 </pre>
DenseNet121	accuracy: 0.9785 loss: 0.0427	<pre> Matrice de confusion : [[18  0  0]  [ 0 11  2]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support   Healthy      1.00      1.00      1.00        18  septoria     1.00      0.85      0.92        13  stripe_rust   0.94      1.00      0.97        31   accuracy          0.97        62  macro avg         0.98      0.95      0.96        62  weighted avg      0.97      0.97      0.97        62 </pre>
DenseNet169	accuracy: 0.9577 loss: 0.1091	<pre> Matrice de confusion : [[16  0  2]  [ 0 13  0]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support   Healthy      1.00      0.89      0.94        18  septoria     1.00      1.00      1.00        13  stripe_rust   0.94      1.00      0.97        31   accuracy          0.97        62  macro avg         0.98      0.96      0.97        62  weighted avg      0.97      0.97      0.97        62 </pre>
Xception	accuracy: 0.9788 loss: 0.1208	<pre> Matrice de confusion : [[18  0  0]  [ 0 13  0]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support   Healthy      0.95      1.00      0.97        18  septoria     1.00      1.00      1.00        13  stripe_rust   1.00      0.97      0.98        31   accuracy          0.98        62  macro avg         0.98      0.99      0.99        62  weighted avg      0.98      0.98      0.98        62 </pre>

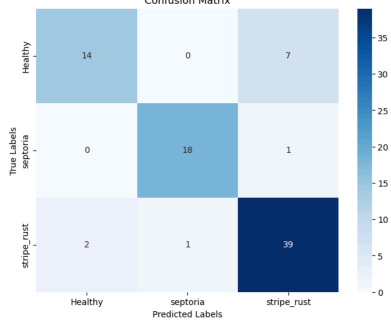
## SMOTETomek:

CNN architecture	Test Accuracy	Confusion Matrix
MobileNetV2	accuracy: 0.9362 loss: 0.1194	<pre> Matrice de confusion : [[16  0  2]  [ 0 12  1]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support  Healthy      0.94      0.89      0.91      18 septoria     1.00      0.92      0.96      13 stripe_rust   0.91      0.97      0.94      31  accuracy      0.95      0.93      0.94      62 macro avg     0.95      0.93      0.94      62 weighted avg  0.94      0.94      0.94      62 </pre>
ResNet50V2	accuracy: 0.9362 - loss: 0.1118	<pre> Matrice de confusion : [[16  0  2]  [ 0 12  1]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support  Healthy      0.94      0.89      0.91      18 septoria     1.00      0.92      0.96      13 stripe_rust   0.91      0.97      0.94      31  accuracy      0.95      0.93      0.94      62 macro avg     0.95      0.93      0.94      62 weighted avg  0.94      0.94      0.94      62 </pre>
ResNet52V2	accuracy:0.9466 - loss: 0.1320	<pre> Matrice de confusion : [[17  0  1]  [ 0 11  2]  [ 1  0 30]] Rapport de classification :       precision    recall  f1-score   support  Healthy      0.94      0.94      0.94      18 septoria     1.00      0.85      0.92      13 stripe_rust   0.91      0.97      0.94      31  accuracy      0.95      0.92      0.94      62 macro avg     0.95      0.92      0.93      62 weighted avg  0.94      0.94      0.94      62 </pre>
DenseNet121	accuracy: 0.9892 - loss: 0.0630	<pre> Matrice de confusion : [[18  0  0]  [ 0 12  1]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support  Healthy      1.00      1.00      1.00      18 septoria     1.00      0.92      0.96      13 stripe_rust   0.97      1.00      0.98      31  accuracy      0.99      0.97      0.98      62 macro avg     0.99      0.97      0.98      62 weighted avg  0.98      0.98      0.98      62 </pre>
DenseNet169	accuracy: 0.9577 - loss: 0.1083	<pre> Matrice de confusion : [[16  0  2]  [ 0 13  0]  [ 0  0 31]] Rapport de classification :       precision    recall  f1-score   support  Healthy      1.00      0.89      0.94      18 septoria     1.00      1.00      1.00      13 stripe_rust   0.94      1.00      0.97      31  accuracy      0.98      0.96      0.97      62 macro avg     0.98      0.96      0.97      62 weighted avg  0.97      0.97      0.97      62 </pre>

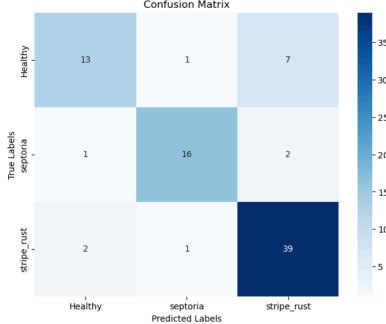
Xception	accuracy: 0.9788 loss: 0.1260	<div>Matrice de confusion : [[18  0  0] [ 0 13  0] [ 1  0 30]]</div> <div>Rapport de classification :</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>Healthy</td><td>0.95</td><td>1.00</td><td>0.97</td><td>18</td></tr><tr><td>septoria</td><td>1.00</td><td>1.00</td><td>1.00</td><td>13</td></tr><tr><td>stripe_rust</td><td>1.00</td><td>0.97</td><td>0.98</td><td>31</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.98</td><td>62</td></tr><tr><td>macro avg</td><td>0.98</td><td>0.99</td><td>0.99</td><td>62</td></tr><tr><td>weighted avg</td><td>0.98</td><td>0.98</td><td>0.98</td><td>62</td></tr></tbody></table>		precision	recall	f1-score	support	Healthy	0.95	1.00	0.97	18	septoria	1.00	1.00	1.00	13	stripe_rust	1.00	0.97	0.98	31	accuracy			0.98	62	macro avg	0.98	0.99	0.99	62	weighted avg	0.98	0.98	0.98	62
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CycleGAN:

CNN architecture	Test Accuracy	Confusion Matrix																																																			
MobileNetV2	Loss: 0.20936338603496552  Accuracy: 0.9024389982223511	<div><p>Confusion Matrix</p><table><thead><tr><th>True Labels \ Predicted Labels</th><th>Healthy</th><th>septoria</th><th>stripe_rust</th></tr></thead><tbody><tr><th>Healthy</th><td>20</td><td>0</td><td>1</td></tr><tr><th>septoria</th><td>0</td><td>18</td><td>1</td></tr><tr><th>stripe_rust</th><td>5</td><td>1</td><td>36</td></tr></tbody></table><p>Classification Report:</p><table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>Healthy</td><td>0.80</td><td>0.95</td><td>0.87</td><td>21</td></tr><tr><td>septoria</td><td>0.95</td><td>0.95</td><td>0.95</td><td>19</td></tr><tr><td>stripe_rust</td><td>0.95</td><td>0.86</td><td>0.90</td><td>42</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.90</td><td>82</td></tr><tr><td>macro avg</td><td>0.90</td><td>0.92</td><td>0.91</td><td>82</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.90</td><td>0.90</td><td>82</td></tr></tbody></table></div>	True Labels \ Predicted Labels	Healthy	septoria	stripe_rust	Healthy	20	0	1	septoria	0	18	1	stripe_rust	5	1	36		precision	recall	f1-score	support	Healthy	0.80	0.95	0.87	21	septoria	0.95	0.95	0.95	19	stripe_rust	0.95	0.86	0.90	42	accuracy			0.90	82	macro avg	0.90	0.92	0.91	82	weighted avg	0.91	0.90	0.90	82
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<div>ResNet152V2</div>	<div>Loss: 0.19507652521133423</div> <div>Accuracy: 0.9390243887901306</div>	<div><div>Confusion Matrix</div><div>Classification Report:</div><table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>Healthy</td><td>1.00</td><td>0.76</td><td>0.86</td><td>21</td></tr><tr><td>septoria</td><td>1.00</td><td>1.00</td><td>1.00</td><td>19</td></tr><tr><td>stripe_rust</td><td>0.89</td><td>1.00</td><td>0.94</td><td>42</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.94</td><td>82</td></tr><tr><td>macro avg</td><td>0.96</td><td>0.92</td><td>0.94</td><td>82</td></tr><tr><td>weighted avg</td><td>0.95</td><td>0.94</td><td>0.94</td><td>82</td></tr></tbody></table></div>		precision	recall	f1-score	support	Healthy	1.00	0.76	0.86	21	septoria	1.00	1.00	1.00	19	stripe_rust	0.89	1.00	0.94	42	accuracy			0.94	82	macro avg	0.96	0.92	0.94	82	weighted avg	0.95	0.94	0.94	82
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stripe_rust	0.83	0.93	0.88	42																																																	
accuracy			0.87	82																																																	
macro avg	0.88	0.85	0.86	82																																																	
weighted avg	0.87	0.87	0.86	82																																																	
Xception	<div>Loss: 0.3533115088939667</div> <div>Accuracy: 0.8292682766914368</div>	<div>Confusion Matrix</div>  <table><tr><th></th><th>Healthy</th><th>septoria</th><th>stripe_rust</th></tr><tr><th>Healthy</th><td>13</td><td>1</td><td>7</td></tr><tr><th>septoria</th><td>1</td><td>16</td><td>2</td></tr><tr><th>stripe_rust</th><td>2</td><td>1</td><td>39</td></tr></table> <div>Classification Report:</div> <table><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr><tr><td>Healthy</td><td>0.81</td><td>0.62</td><td>0.70</td><td>21</td></tr><tr><td>septoria</td><td>0.89</td><td>0.84</td><td>0.86</td><td>19</td></tr><tr><td>stripe_rust</td><td>0.81</td><td>0.93</td><td>0.87</td><td>42</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.83</td><td>82</td></tr><tr><td>macro avg</td><td>0.84</td><td>0.80</td><td>0.81</td><td>82</td></tr><tr><td>weighted avg</td><td>0.83</td><td>0.83</td><td>0.82</td><td>82</td></tr></table>		Healthy	septoria	stripe_rust	Healthy	13	1	7	septoria	1	16	2	stripe_rust	2	1	39		precision	recall	f1-score	support	Healthy	0.81	0.62	0.70	21	septoria	0.89	0.84	0.86	19	stripe_rust	0.81	0.93	0.87	42	accuracy			0.83	82	macro avg	0.84	0.80	0.81	82	weighted avg	0.83	0.83	0.82	82
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