

LAMPIRAN

LAMPIRAN 1 : HASIL PENGUJIAN PARAMETER

a. convolutional2dLayer (2,10) dan maxPooling2dLayer(2,'Stride',2)

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	3.74	-0.0000	100.00%	0.000100
3	100	7.40	-0.0000	100.00%	0.000100
4	150	11.06	7.9712	50.00%	0.000100
5	200	14.72	-0.0000	100.00%	0.000100
6	250	18.38	-0.0000	100.00%	0.000100
7	300	22.05	-0.0000	100.00%	0.000100
8	350	25.71	-0.0000	100.00%	0.000100
9	400	29.37	7.9712	50.00%	0.000100
10	450	33.07	7.9712	50.00%	0.000100
12	500	36.79	-0.0000	100.00%	0.000100
13	550	40.52	-0.0000	100.00%	0.000100
14	600	44.24	7.9712	50.00%	0.000100
15	650	47.96	-0.0000	100.00%	0.000100

accuracy =

0.9000

b. convolutional2dLayer (2,10) dan maxPooling2dLayer(4,'Padding',2)

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	9.07	7.9712	50.00%	0.000100
3	100	18.19	-0.0000	100.00%	0.000100
4	150	27.26	-0.0000	100.00%	0.000100
5	200	36.38	-0.0000	100.00%	0.000100
6	250	45.46	7.9712	50.00%	0.000100
7	300	57.67	7.9712	50.00%	0.000100
8	350	66.82	7.9712	50.00%	0.000100
9	400	75.90	-0.0000	100.00%	0.000100
10	450	84.96	-0.0000	100.00%	0.000100
12	500	94.04	7.9712	50.00%	0.000100
13	550	104.96	-0.0000	100.00%	0.000100
14	600	115.79	-0.0000	100.00%	0.000100
15	650	124.89	-0.0000	100.00%	0.000100

accuracy =

0.8000

c. convolutional2dLayer (5,20) dan maxPooling2dLayer(2,'Stride',2)

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	7.53	-0.0000	100.00%	0.000100
3	100	15.02	-0.0000	100.00%	0.000100
4	150	22.53	-0.0000	100.00%	0.000100
5	200	30.03	-0.0000	100.00%	0.000100
6	250	37.53	7.9712	50.00%	0.000100
7	300	45.04	7.9712	50.00%	0.000100
8	350	52.55	-0.0000	100.00%	0.000100
9	400	60.05	7.9712	50.00%	0.000100
10	450	67.65	-0.0000	100.00%	0.000100
12	500	75.15	-0.0000	100.00%	0.000100
13	550	82.66	-0.0000	100.00%	0.000100
14	600	90.17	-0.0000	100.00%	0.000100
15	650	97.67	-0.0000	100.00%	0.000100

accuracy =

0.8667

d. convolutional2dLayer (5,20) dan maxPooling2dLayer(4,'Padding',2)

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	17.91	-0.0000	100.00%	0.000100
3	100	36.03	-0.0000	100.00%	0.000100
4	150	54.14	7.9712	50.00%	0.000100
5	200	72.86	-0.0000	100.00%	0.000100
6	250	90.99	-0.0000	100.00%	0.000100
7	300	109.11	-0.0000	100.00%	0.000100
8	350	127.23	7.9712	50.00%	0.000100
9	400	145.34	7.9712	50.00%	0.000100
10	450	163.45	-0.0000	100.00%	0.000100
12	500	181.57	-0.0000	100.00%	0.000100
13	550	199.69	-0.0000	100.00%	0.000100
14	600	217.80	7.9712	50.00%	0.000100
15	650	235.92	-0.0000	100.00%	0.000100

accuracy =

0.7000

e. `convolutional2dLayer(2,10)`, `maxPooling2dLayer(2,'Stride',2)`, dan

`reluLayer`

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	8.50	7.9712	50.00%	0.000100
3	100	16.97	7.9712	50.00%	0.000100
4	150	25.43	-0.0000	100.00%	0.000100
5	200	33.89	-0.0000	100.00%	0.000100
6	250	42.35	7.9712	50.00%	0.000100
7	300	50.81	-0.0000	100.00%	0.000100
8	350	59.27	7.9712	50.00%	0.000100
9	400	67.73	-0.0000	100.00%	0.000100
10	450	76.19	-0.0000	100.00%	0.000100
12	500	84.66	7.9712	50.00%	0.000100
13	550	93.11	7.9712	50.00%	0.000100
14	600	101.57	-0.0000	100.00%	0.000100
15	650	110.03	-0.0000	100.00%	0.000100

accuracy =

0.7000

f. `convolutional2dLayer(2,10)`, `maxPooling2dLayer(4,'Padding',2)`, dan

`reluLayer`

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
3	50	20.96	-0.0000	100.00%	0.000100
6	100	37.94	-0.0000	100.00%	0.000100
9	150	54.84	-0.0000	100.00%	0.000100
12	200	71.72	3.1885	80.00%	0.000100
14	250	88.65	3.1885	80.00%	0.000100
17	300	105.56	3.3271	60.00%	0.000100
20	350	122.47	-0.0000	100.00%	0.000100
23	400	139.37	6.3770	60.00%	0.000100
25	450	156.26	3.1885	80.00%	0.000100
28	500	173.15	-0.0000	100.00%	0.000100
31	550	190.09	-0.0000	100.00%	0.000100
34	600	206.99	-0.0000	100.00%	0.000100
37	650	223.91	3.1885	80.00%	0.000100
39	700	240.70	3.1885	80.00%	0.000100
42	750	257.58	3.3271	60.00%	0.000100
45	800	274.45	-0.0000	100.00%	0.000100
48	850	291.27	6.3770	60.00%	0.000100
50	900	308.06	3.1885	80.00%	0.000100

accuracy =

0.7667

g. convolutional2dLayer (5,20), maxPooling2dLayer(2,'Stride',2), dan

reluLayer

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	9.83	7.9712	50.00%	0.000100
3	100	17.32	-0.0000	100.00%	0.000100
4	150	24.85	-0.0000	100.00%	0.000100
5	200	32.37	-0.0000	100.00%	0.000100
6	250	39.90	-0.0000	100.00%	0.000100
7	300	47.43	7.9712	50.00%	0.000100
8	350	54.95	-0.0000	100.00%	0.000100
9	400	62.48	-0.0000	100.00%	0.000100
10	450	70.00	-0.0000	100.00%	0.000100
12	500	77.53	7.9712	50.00%	0.000100
13	550	85.05	-0.0000	100.00%	0.000100
14	600	92.62	-0.0000	100.00%	0.000100
15	650	100.15	-0.0000	100.00%	0.000100

accuracy =

0.7000

h. convolutional2dLayer (5,20), maxPooling2dLayer(4,'Padding',2), dan

reluLayer

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	17.93	7.9712	50.00%	0.000100
3	100	35.93	-0.0000	100.00%	0.000100
4	150	53.93	-0.0000	100.00%	0.000100
5	200	71.93	-0.0000	100.00%	0.000100
6	250	89.92	-0.0000	100.00%	0.000100
7	300	107.91	-0.0000	100.00%	0.000100
8	350	125.90	-0.0000	100.00%	0.000100
9	400	143.90	7.9712	50.00%	0.000100
10	450	161.89	-0.0000	100.00%	0.000100
12	500	179.89	7.9712	50.00%	0.000100
13	550	197.89	-0.0000	100.00%	0.000100
14	600	215.89	-0.0000	100.00%	0.000100
15	650	233.88	-0.0000	100.00%	0.000100

accuracy =

0.7667

i. MaxEpoch 15 dan MiniBatchSize 2

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	3.74	-0.0000	100.00%	0.000100
3	100	7.40	-0.0000	100.00%	0.000100
4	150	11.06	7.9712	50.00%	0.000100
5	200	14.72	-0.0000	100.00%	0.000100
6	250	18.38	-0.0000	100.00%	0.000100
7	300	22.05	-0.0000	100.00%	0.000100
8	350	25.71	-0.0000	100.00%	0.000100
9	400	29.37	7.9712	50.00%	0.000100
10	450	33.07	7.9712	50.00%	0.000100
12	500	36.79	-0.0000	100.00%	0.000100
13	550	40.52	-0.0000	100.00%	0.000100
14	600	44.24	7.9712	50.00%	0.000100
15	650	47.96	-0.0000	100.00%	0.000100

accuracy =

0.9000

j. MaxEpoch 15 dan MiniBatchSize 5

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
3	50	7.65	-0.0000	100.00%	0.000100
6	100	15.22	-0.0000	100.00%	0.000100
9	150	22.79	6.3770	60.00%	0.000100
12	200	30.38	-0.0000	100.00%	0.000100
14	250	37.94	6.3770	60.00%	0.000100

accuracy =

0.8667

k. MaxEpoch 15 dan MiniBatchSize 10

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
6	50	14.93	-0.0000	100.00%	0.000100
12	100	29.81	4.7827	70.00%	0.000100

accuracy =

0.7667

l. MaxEpoch 30 dan MiniBatchSize 2

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	3.69	-0.0000	100.00%	0.000100
3	100	7.35	-0.0000	100.00%	0.000100
4	150	11.00	-0.0000	100.00%	0.000100
5	200	14.66	15.9424	0.00%	0.000100
6	250	18.30	-0.0000	100.00%	0.000100
7	300	21.94	7.9712	50.00%	0.000100
8	350	25.58	15.9424	0.00%	0.000100
9	400	29.22	7.9712	50.00%	0.000100
10	450	32.86	-0.0000	100.00%	0.000100
12	500	36.51	-0.0000	100.00%	0.000100
13	550	40.19	-0.0000	100.00%	0.000100
14	600	43.87	-0.0000	100.00%	0.000100
15	650	47.53	15.9424	0.00%	0.000100
16	700	51.18	-0.0000	100.00%	0.000100
17	750	54.89	7.9712	50.00%	0.000100
18	800	58.55	15.9424	0.00%	0.000100
19	850	62.19	7.9712	50.00%	0.000100
20	900	65.84	-0.0000	100.00%	0.000100
22	950	69.51	-0.0000	100.00%	0.000100
23	1000	73.16	-0.0000	100.00%	0.000100
24	1050	76.80	-0.0000	100.00%	0.000100
25	1100	80.50	15.9424	0.00%	0.000100
26	1150	84.14	-0.0000	100.00%	0.000100
27	1200	87.78	7.9712	50.00%	0.000100
28	1250	91.42	15.9424	0.00%	0.000100
29	1300	95.06	7.9712	50.00%	0.000100
30	1350	98.73	-0.0000	100.00%	0.000100

accuracy =

0.7000

m. MaxEpoch 30 dan MiniBatchSize 5

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
3	50	7.60	6.3770	60.00%	0.000100
6	100	15.15	-0.0000	100.00%	0.000100
9	150	22.68	-0.0000	100.00%	0.000100
12	200	32.43	-0.0000	100.00%	0.000100
14	250	39.99	-0.0000	100.00%	0.000100
17	300	47.56	3.1885	80.00%	0.000100
20	350	55.08	-0.0000	100.00%	0.000100
23	400	62.66	3.1885	80.00%	0.000100
25	450	70.19	3.1885	80.00%	0.000100
28	500	77.73	6.3770	60.00%	0.000100

accuracy =

0.7000

n. MaxEpoch 30 dan MiniBatchSize 10

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
6	50	14.99	3.1885	80.00%	0.000100
12	100	29.93	7.9712	50.00%	0.000100
17	150	44.86	4.7827	70.00%	0.000100
23	200	59.76	1.5942	90.00%	0.000100
28	250	74.69	3.1885	80.00%	0.000100

accuracy =

0.6000

o. MaxEpoch 50 dan MiniBatchSize 2

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
2	50	3.65	-0.0000	100.00%	0.000100
3	100	7.29	7.9712	50.00%	0.000100
4	150	10.93	-0.0000	100.00%	0.000100
5	200	14.56	7.9712	50.00%	0.000100
6	250	18.20	-0.0000	100.00%	0.000100
7	300	21.84	-0.0000	100.00%	0.000100
8	350	25.48	-0.0000	100.00%	0.000100
9	400	29.12	-0.0000	100.00%	0.000100
10	450	32.76	-0.0000	100.00%	0.000100
12	500	36.40	-0.0000	100.00%	0.000100
13	550	40.04	7.9712	50.00%	0.000100
14	600	43.69	-0.0000	100.00%	0.000100
15	650	47.32	7.9712	50.00%	0.000100
16	700	50.98	-0.0000	100.00%	0.000100
17	750	54.62	-0.0000	100.00%	0.000100
18	800	58.27	-0.0000	100.00%	0.000100
19	850	61.91	-0.0000	100.00%	0.000100
20	900	65.55	-0.0000	100.00%	0.000100
22	950	69.20	-0.0000	100.00%	0.000100
23	1000	72.84	7.9712	50.00%	0.000100
24	1050	76.48	-0.0000	100.00%	0.000100
25	1100	80.12	7.9712	50.00%	0.000100
26	1150	83.76	-0.0000	100.00%	0.000100
27	1200	87.40	-0.0000	100.00%	0.000100
28	1250	91.05	-0.0000	100.00%	0.000100
29	1300	94.69	-0.0000	100.00%	0.000100
30	1350	98.34	-0.0000	100.00%	0.000100
32	1400	101.98	-0.0000	100.00%	0.000100
33	1450	105.62	7.9712	50.00%	0.000100
34	1500	109.26	-0.0000	100.00%	0.000100
35	1550	112.91	7.9712	50.00%	0.000100
36	1600	116.55	-0.0000	100.00%	0.000100
37	1650	120.19	-0.0000	100.00%	0.000100
38	1700	123.84	-0.0000	100.00%	0.000100
39	1750	127.50	-0.0000	100.00%	0.000100
40	1800	131.14	-0.0000	100.00%	0.000100
42	1850	134.78	-0.0000	100.00%	0.000100
43	1900	138.42	7.9712	50.00%	0.000100
44	1950	142.07	-0.0000	100.00%	0.000100
45	2000	145.71	7.9712	50.00%	0.000100
46	2050	149.35	-0.0000	100.00%	0.000100
47	2100	152.99	-0.0000	100.00%	0.000100

48	2150	156.64	-0.0000	100.00%	0.000100
49	2200	160.28	-0.0000	100.00%	0.000100
50	2250	163.92	-0.0000	100.00%	0.000100

accuracy =

0.8667

p. MaxEpoch 50 dan MiniBatchSize 5

Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
3	50	7.51	1.5230	80.00%	0.000100
6	100	15.05	-0.0000	100.00%	0.000100
9	150	22.60	3.1885	80.00%	0.000100
12	200	30.15	-0.0000	100.00%	0.000100
14	250	37.72	-0.0000	100.00%	0.000100
17	300	45.32	3.1885	80.00%	0.000100
20	350	52.86	-0.0000	100.00%	0.000100
23	400	60.39	3.1885	80.00%	0.000100
25	450	67.95	3.1885	80.00%	0.000100
28	500	75.50	-0.0000	100.00%	0.000100
31	550	83.06	-0.0000	100.00%	0.000100
34	600	90.61	3.1885	80.00%	0.000100
37	650	98.16	-0.0000	100.00%	0.000100
39	700	105.72	-0.0000	100.00%	0.000100
42	750	113.27	3.1885	80.00%	0.000100
45	800	120.82	-0.0000	100.00%	0.000100
48	850	128.36	3.1885	80.00%	0.000100
50	900	135.91	3.1885	80.00%	0.000100

accuracy =

0.9667

q. MaxEpoch 50 dan MiniBatchSize 10

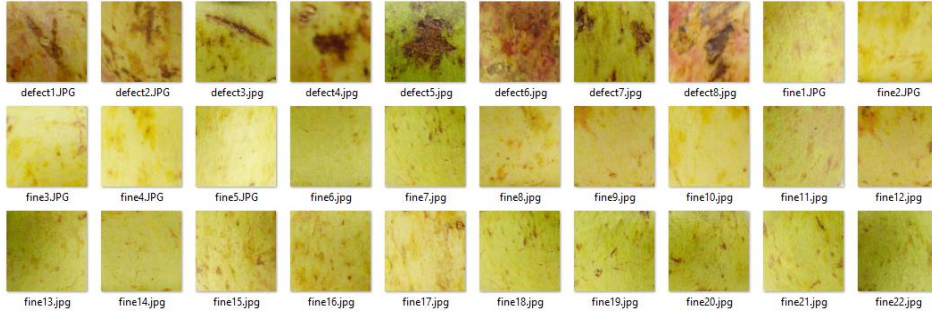
Epoch	Iteration	Time Elapsed (seconds)	Mini-batch Loss	Mini-batch Accuracy	Base Learning Rate
6	50	16.22	1.5942	90.00%	0.000100
12	100	31.11	4.7827	70.00%	0.000100
17	150	46.04	1.5942	90.00%	0.000100
23	200	60.96	1.5942	90.00%	0.000100
28	250	75.83	4.7827	70.00%	0.000100
34	300	90.81	1.5942	90.00%	0.000100
39	350	105.77	-0.0000	100.00%	0.000100
45	400	120.72	-0.0000	100.00%	0.000100
50	450	135.76	3.1885	80.00%	0.000100

accuracy =

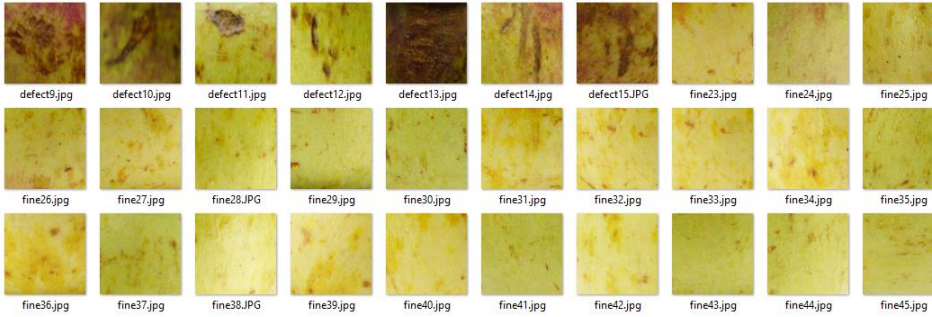
0.7000

LAMPIRAN 2 : CITRA UJI DAN CITRA LATIH

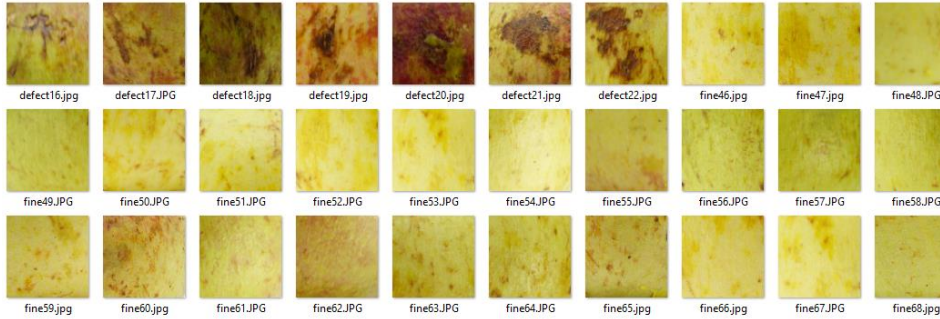
a. Citra *fold-1*



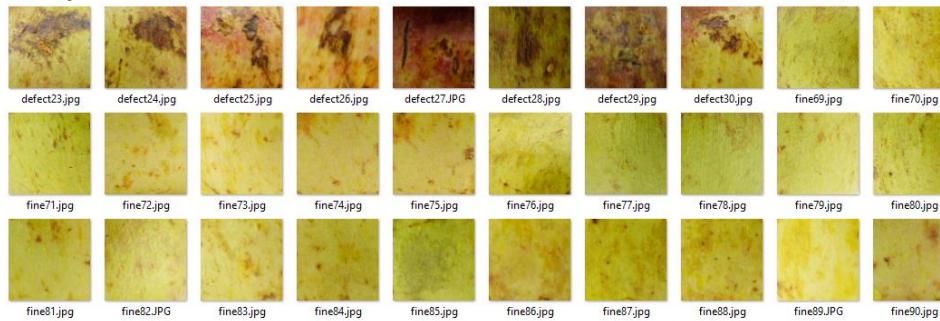
b. Citra *fold-2*



c. Citra *fold-3*



d. Citra *fold-4*



LAMPIRAN 3 : SKRIP PROGRAM

a. Fungsi klasifikasi gambar (*deepLearning.m*)

```
%% Path (default) %%
trainManggisPath = fullfile('D:', 'Documents', 'Kuliah', 'Semester
8', ...
    'SKRIPSI', 'Eksperimen Curvelab', 'k-fold cv', 'fold 1',
'training');
testManggisPath = fullfile('D:', 'Documents', 'Kuliah', 'Semester
8', ...
    'SKRIPSI', 'Eksperimen Curvelab', 'k-fold cv', 'fold 1',
'testing');

%% Specify Training and Test Sets
trainManggisData = imageDatastore(trainManggisPath,
'IncludeSubfolders',true, ...
    'LabelSource','foldernames','FileExtensions','.jpg');
testManggisData = imageDatastore(testManggisPath,
'IncludeSubfolders',true, ...
    'LabelSource','foldernames','FileExtensions','.jpg');

%% Define the Network Layers
layers = [imageInputLayer([512 512 3]) % dimensi gambar
    convolution2dLayer(2,10)
    maxPooling2dLayer(2,'Stride',2)
    fullyConnectedLayer(2) % based on # of classes
    softmaxLayer
    classificationLayer()];

%% Specify the Training Options
options =
trainingOptions('sgdm','MaxEpochs',50,'MiniBatchSize',5,...
    'InitialLearnRate',0.0001);

%% Train the Network Using Training Data With Feature Extraction
convnet = trainNetwork(trainManggisData,layers,options);

%% Classify the Images in the Test Data and Compute Accuracy
sampleTest = testManggisData.Labels; %label yang sebenarnya
resultTest = classify(convnet,testManggisData); %tes klasifikasi

accuracy = mean(sampleTest == resultTest)

%% menampilkan gambar
figure;
for i = 1:30
    subplot(5,6,i);
    imshow(testManggisData.Files{(i)});
    title(char(resultTest(i)))
end
```