Deep Restore

Architecture Comparision Server

September 9, 2018

Description

- Densenet, Early, Late and Bottleneck use patches of size 128x128 + mirror padding (padding size depending on architecture)
- All testes architectures use the information of previous, current and next frame
- 1000 iterations
- augmented training set
- last activation function: sigmoid
- train and test data visualized for early stopping
- accuracy and loss for each architecture and early stopping
- dropout with 0.85 keep probability
- L2 regularization of weights (weight decay)
- batch normalization

Early Combine

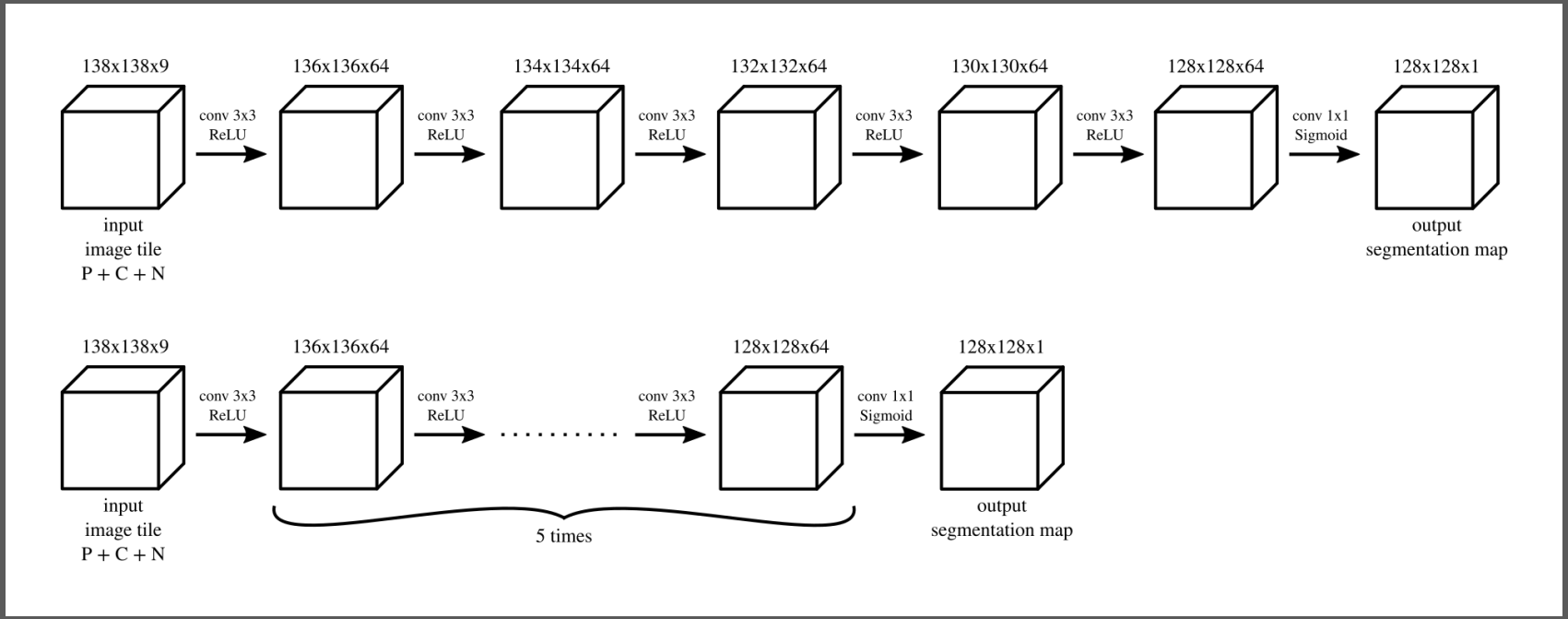


Figure: Early

Late Combine

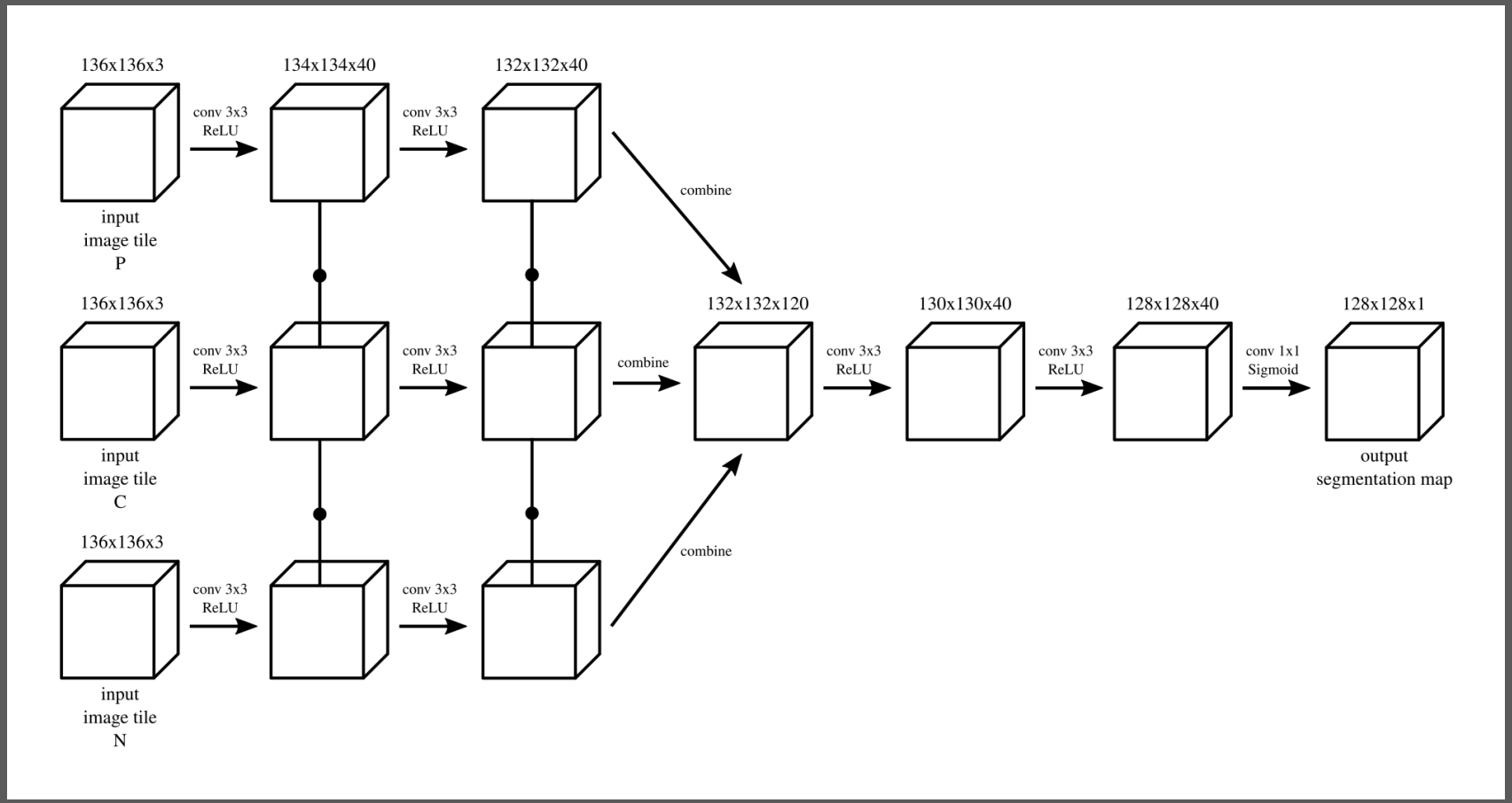


Figure: Late

Densenet

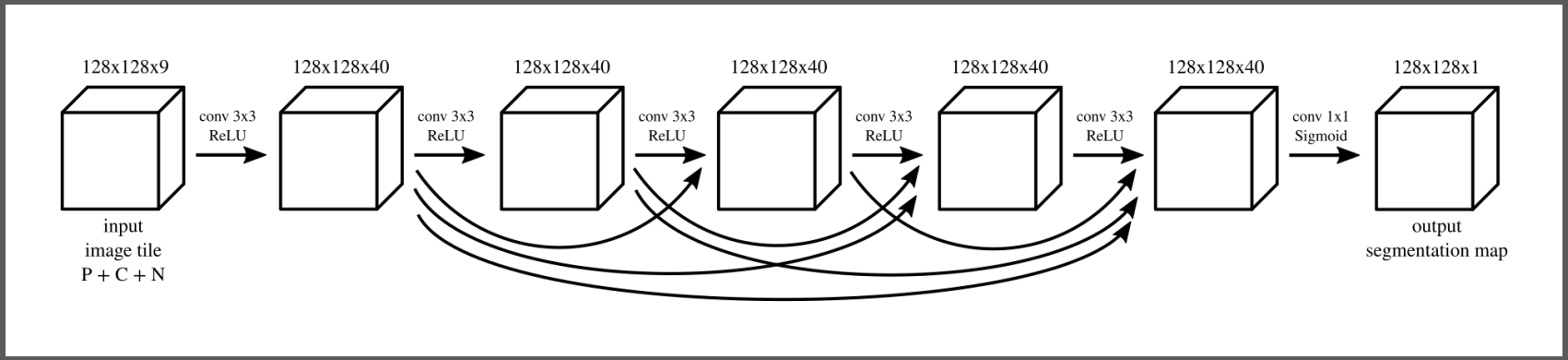


Figure: densenet

Bottleneck

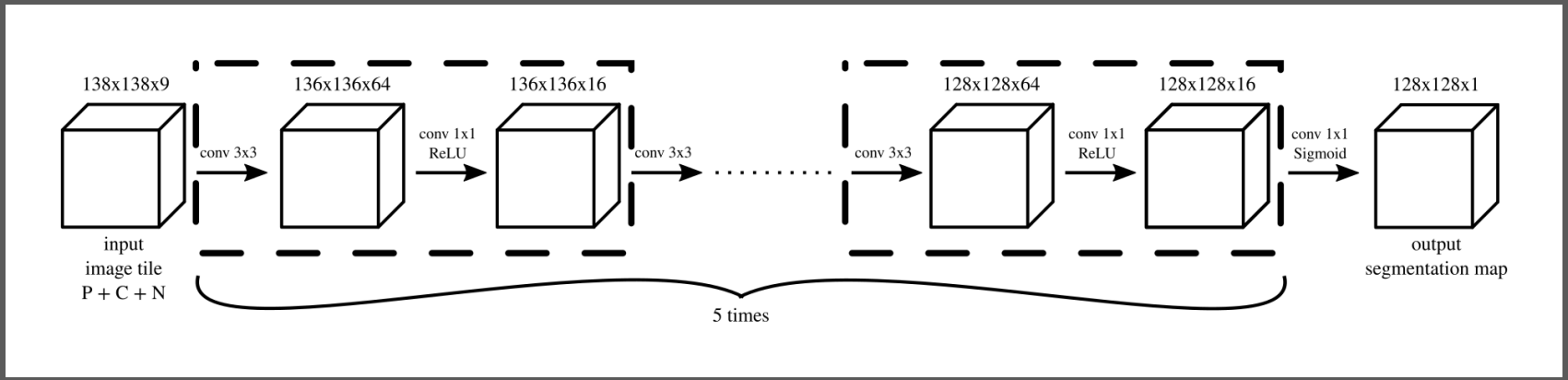


Figure: Bottleneck

Densenet combined

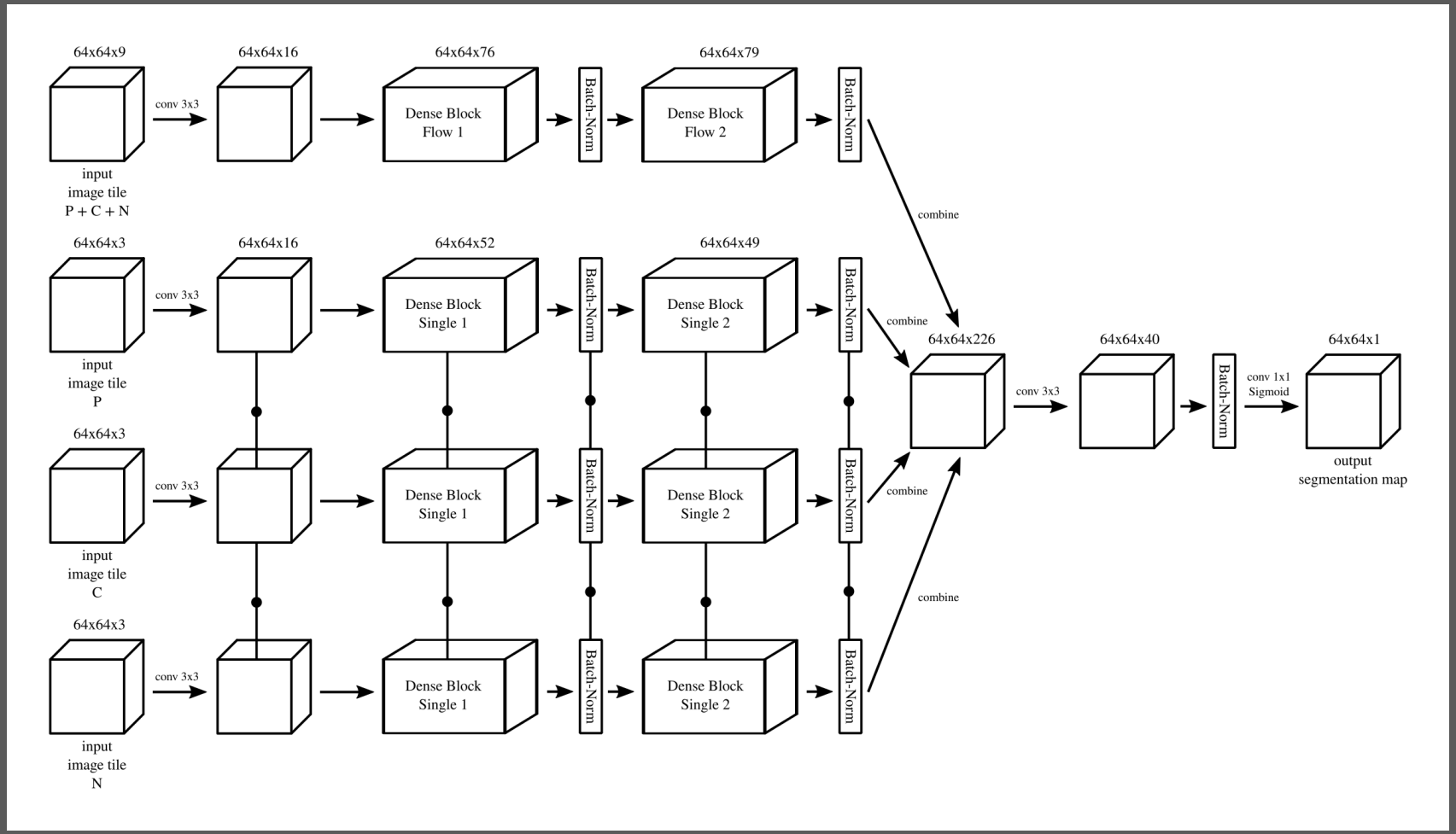


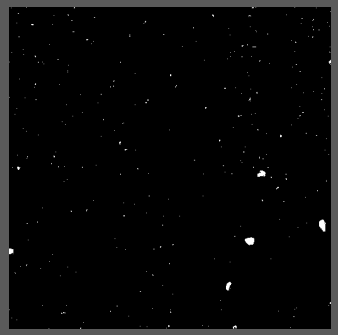
Figure: Densenet combined

Train - Ex1

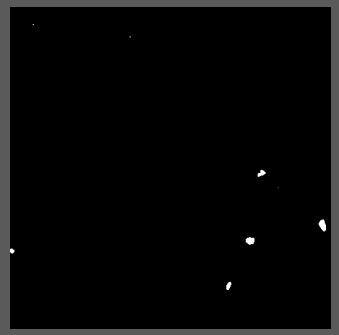
(a) Input

(b) GT

(a) early



(b) late



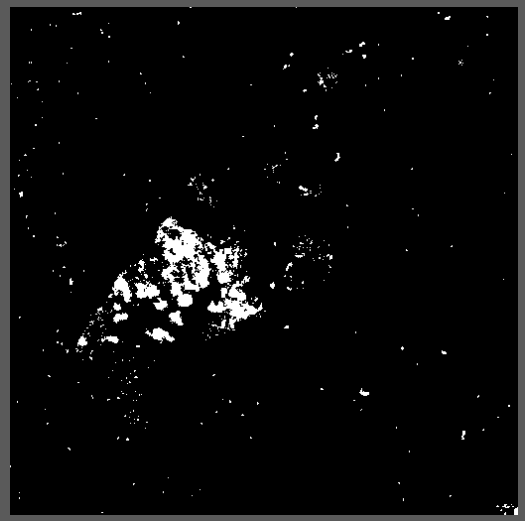
(c) densenet

(d) bottleneck

(e) densenet comb

Train - Ex2

(a) Input



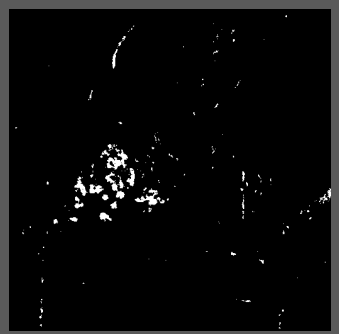
(b) GT

(a) early

(b) late

(c) densenet

(d) bottleneck



(e) densenet comb

Train - Ex3

(a) Input

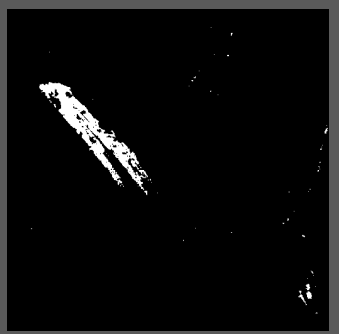
(b) GT

(a) early

(b) late

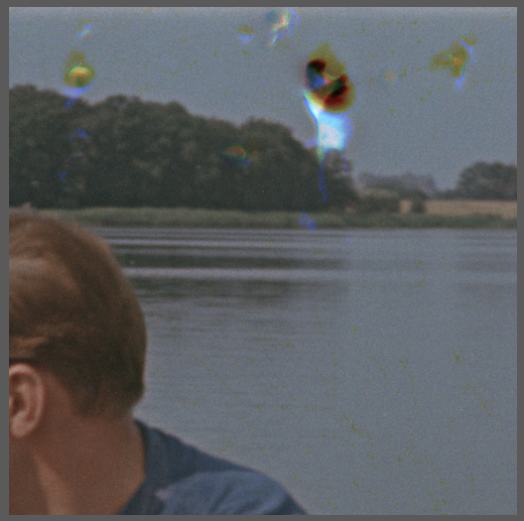
(c) densenet

(d) bottleneck

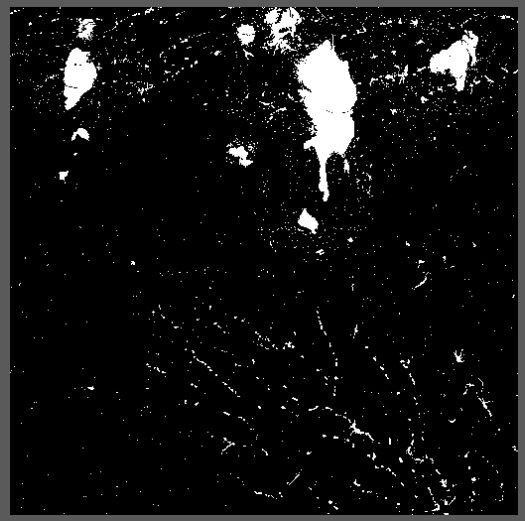


(e) densenet comb

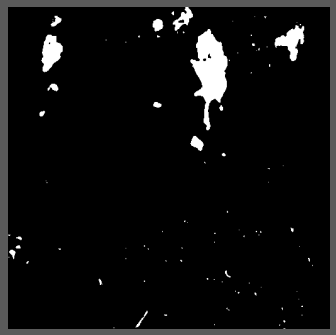
Train - Ex4



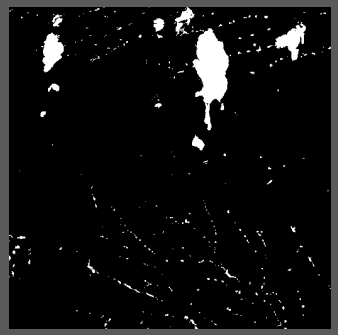
(a) Input



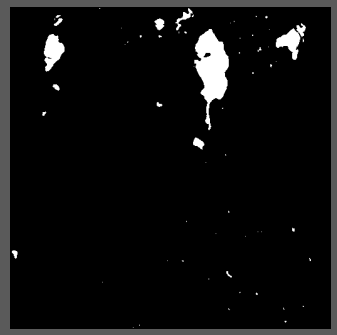
(b) GT



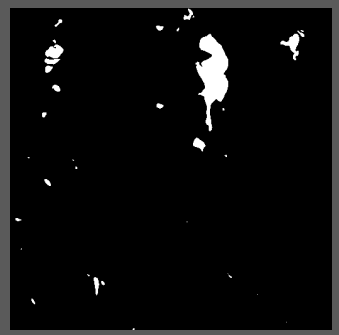
(a) early



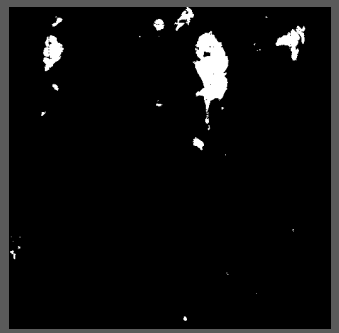
(b) late



(c) densenet



(d) bottleneck

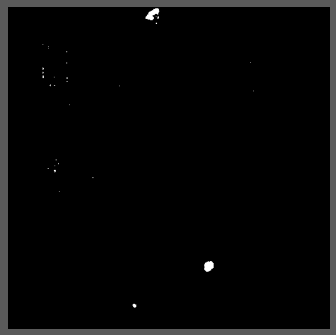


(e) densenet comb

Train - Ex5

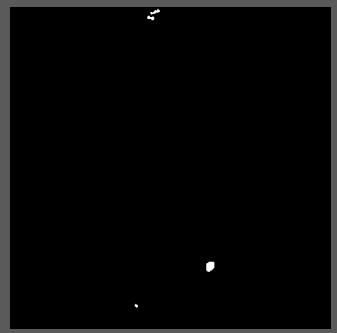
(a) Input

(b) GT

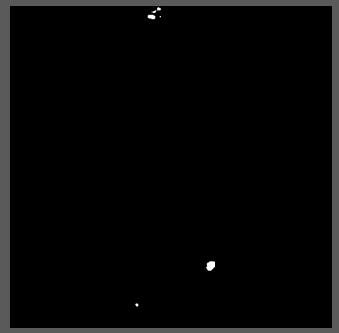


(a) early

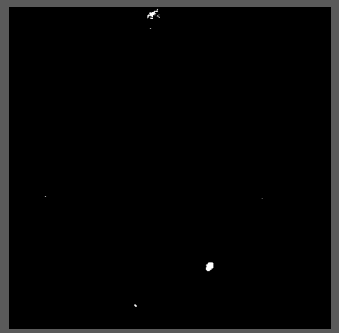
(b) late



(c) densenet



(d) bottleneck



(e) densenet comb

Train - Ex6

(a) Input

(b) GT

(a) early

(b) late

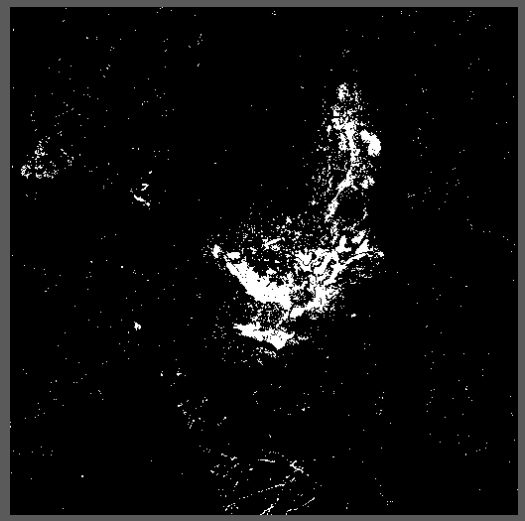
(c) densenet

(d) bottleneck

(e) densenet comb

Train - Ex7

(a) Input



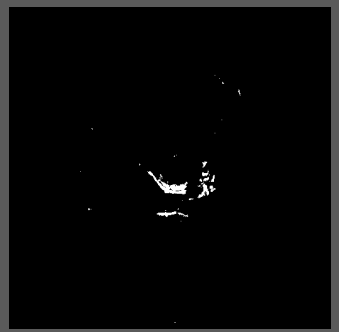
(b) GT

(a) early

(b) late

(c) densenet

(d) bottleneck

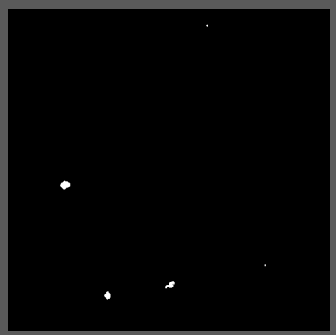


(e) densenet comb

Train - Ex8

(a) Input

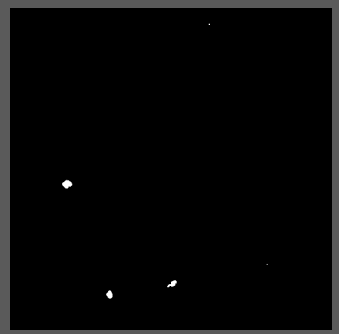
(b) GT



(a) early

(b) late

(c) densenet



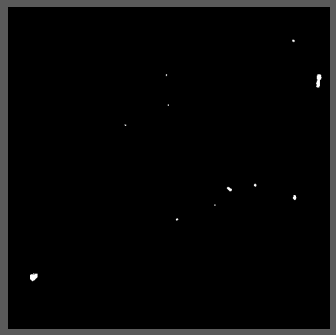
(d) bottleneck

(e) densenet comb

Train - Ex9

(a) Input

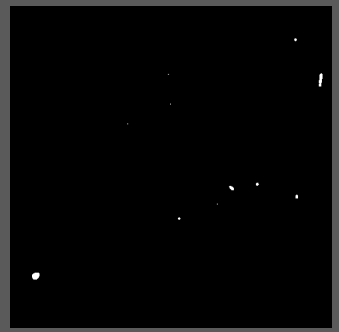
(b) GT



(a) early

(b) late

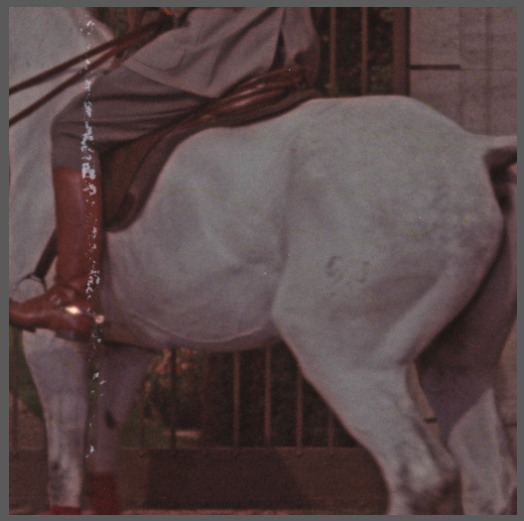
(c) densenet



(d) bottleneck

(e) densenet comb

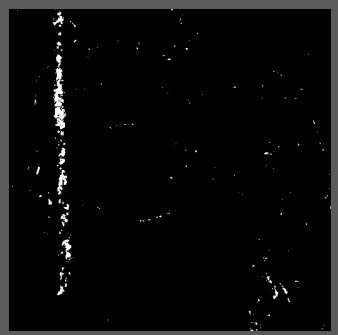
Train - Ex10



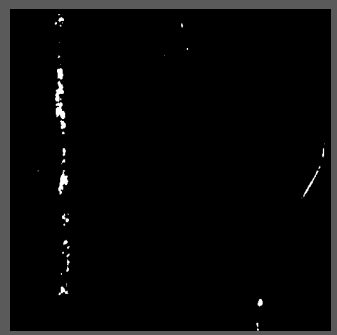
(a) Input

(b) GT

(a) early



(b) late



(c) densenet

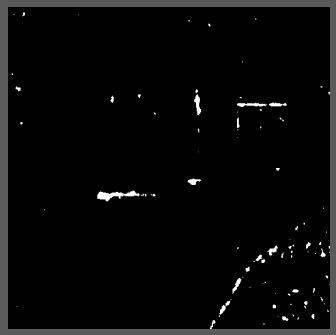
(d) bottleneck

(e) densenet comb

Train - Ex11

(a) Input

(b) GT



(a) early

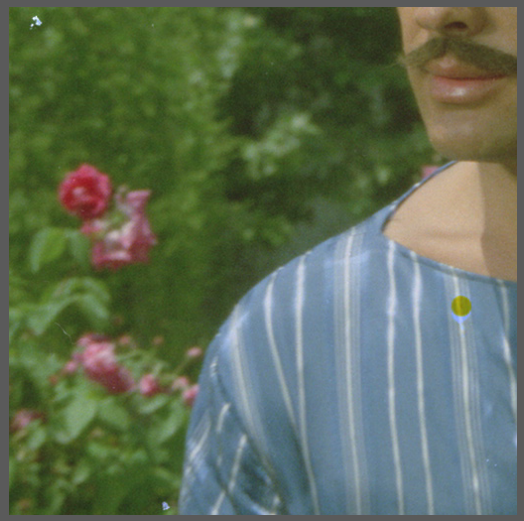
(b) late

(c) densenet

(d) bottleneck

(e) densenet comb

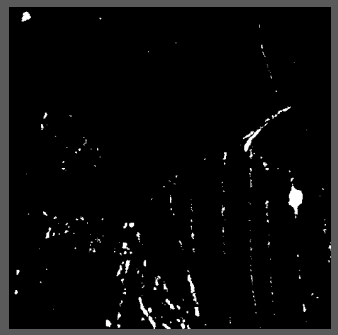
Train - Ex12



(a) Input

(b) GT

(a) early



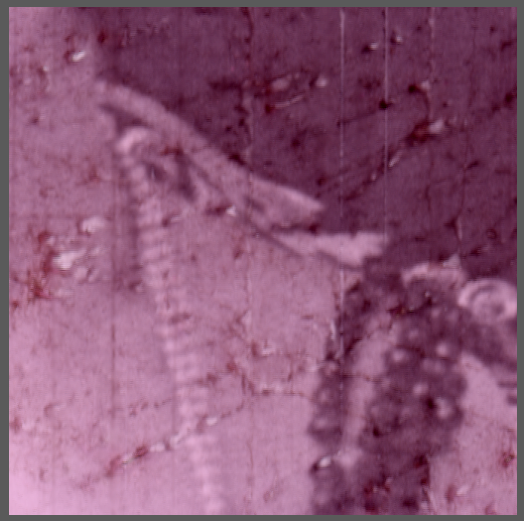
(b) late

(c) densenet

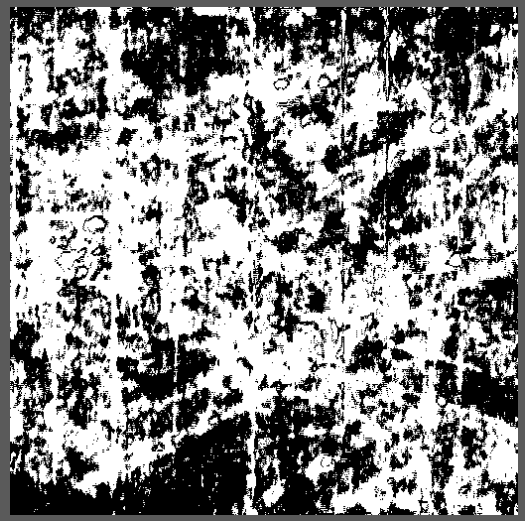
(d) bottleneck

(e) densenet comb

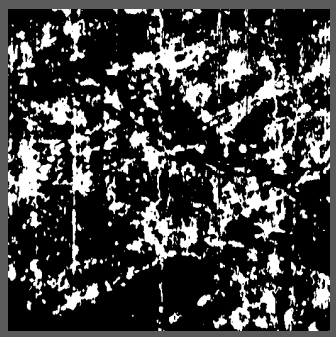
Train - Ex13



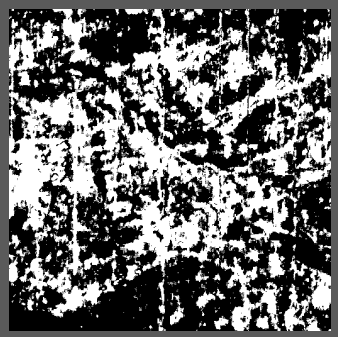
(a) Input



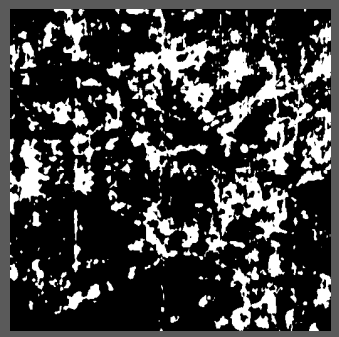
(b) GT



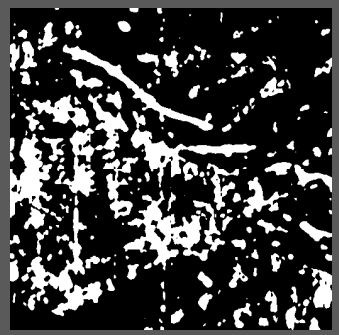
(a) early



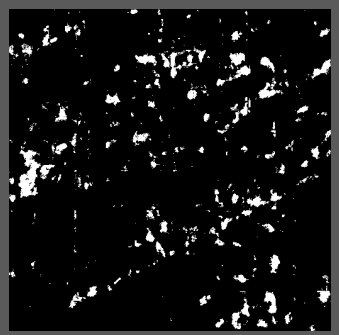
(b) late



(c) densenet



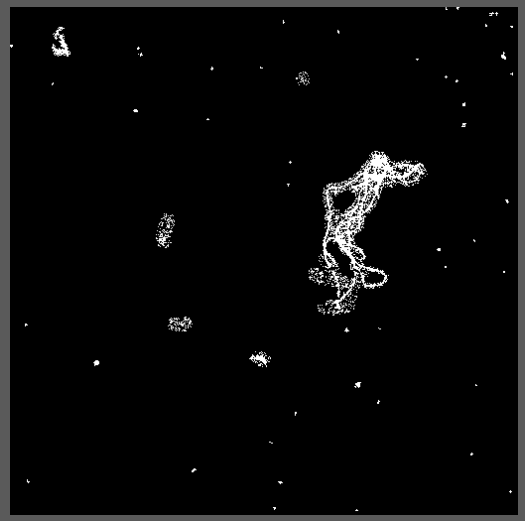
(d) bottleneck



(e) densenet comb

Train - Ex14

(a) Input



(b) GT

(a) early

(b) late

(c) densenet

(d) bottleneck

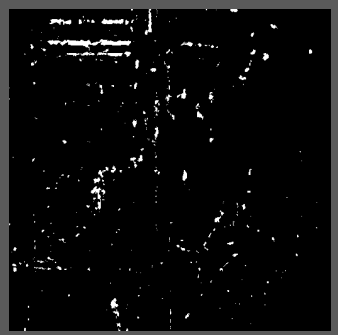
(e) densenet comb

Train - Ex15

(a) Input

(b) GT

(a) early



(b) late

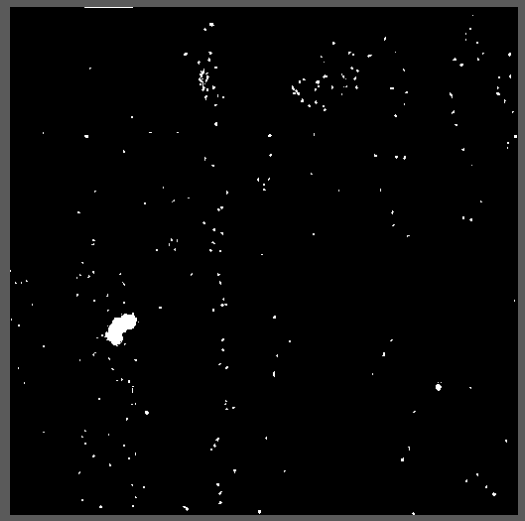
(c) densenet

(d) bottleneck

(e) densenet comb

Ex1

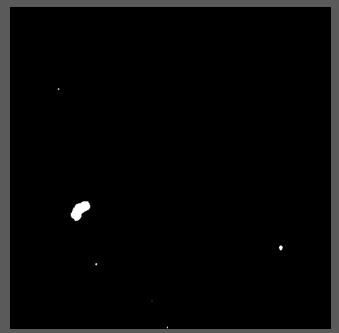
(a) Input



(b) GT

(a) early

(b) late

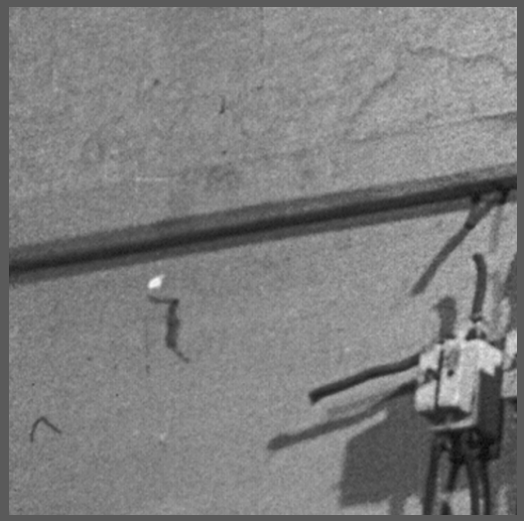


(c) densenet

(d) bottleneck

(e) densenet comb

Ex2



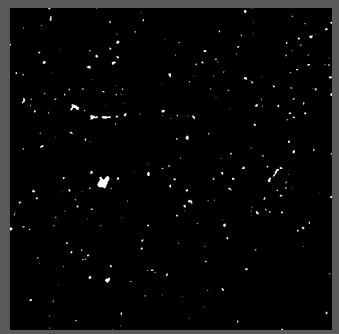
(a) Input

(b) GT

(a) early

(b) late

(c) densenet

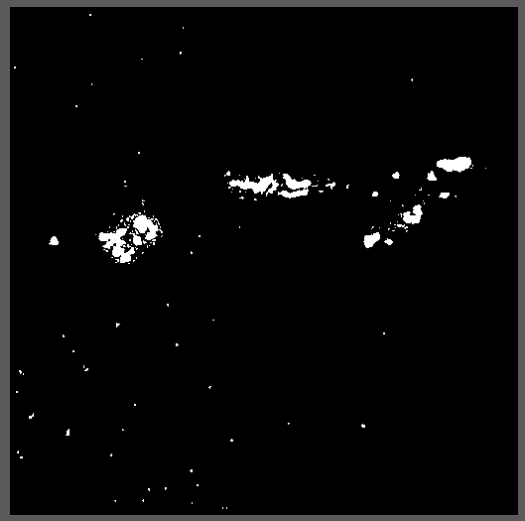


(d) bottleneck

(e) densenet comb

Ex3

(a) Input

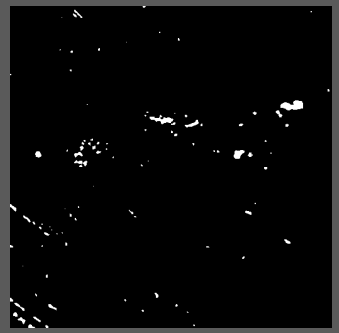


(b) GT

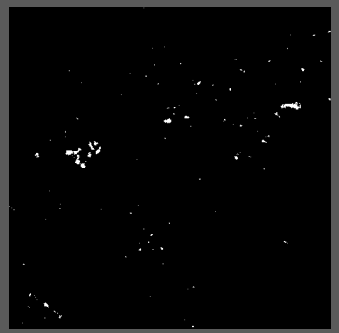
(a) early

(b) late

(c) densenet



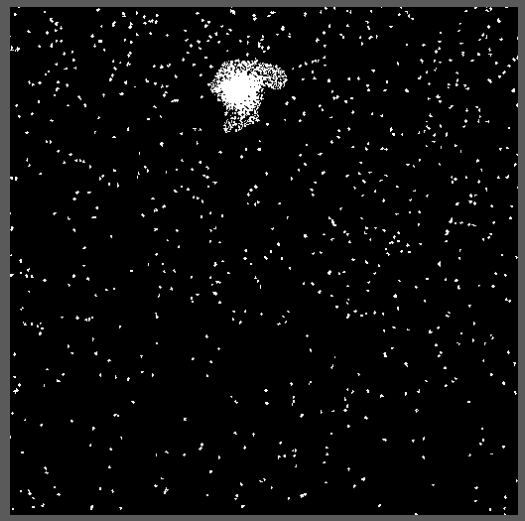
(d) bottleneck



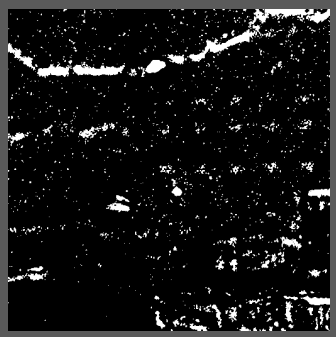
(e) densenet comb

Ex4

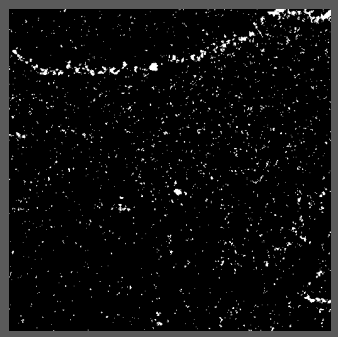
(a) Input



(b) GT

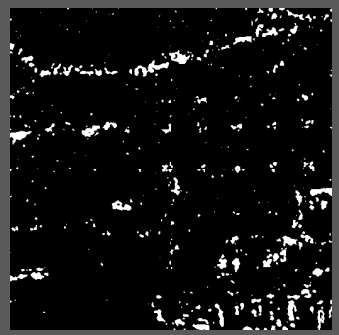


(a) early

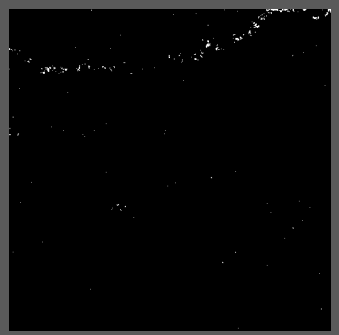


(b) late

(c) densenet

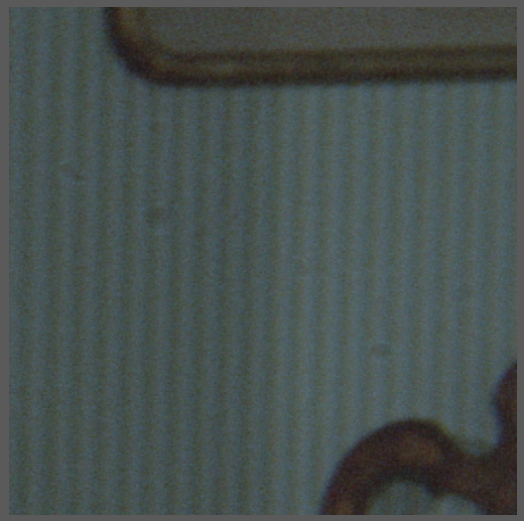


(d) bottleneck

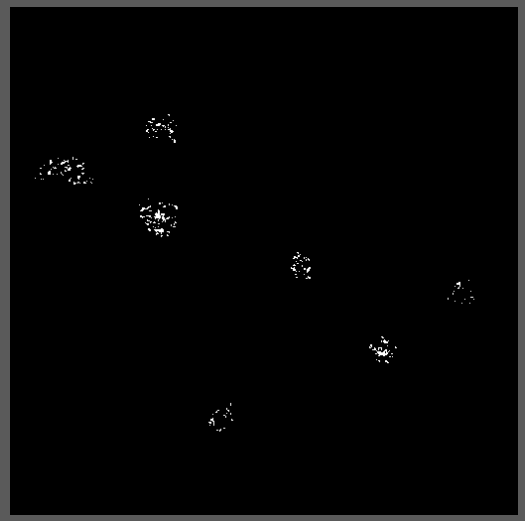


(e) densenet comb

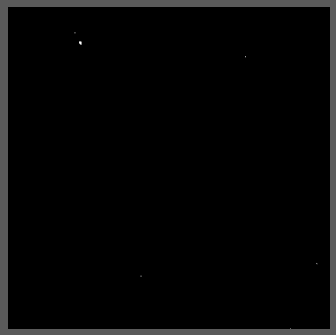
Ex5



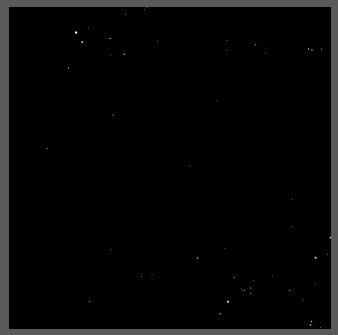
(a) Input



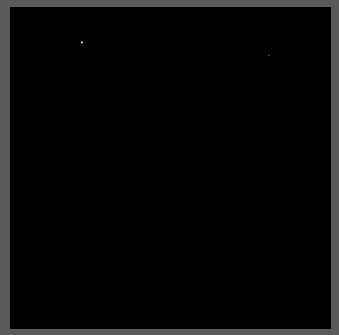
(b) GT



(a) early

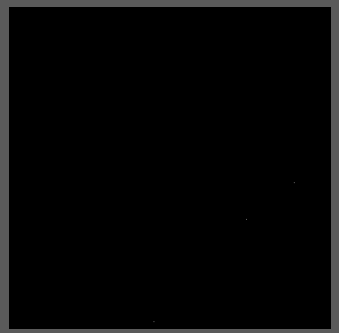


(b) late



(c) densenet

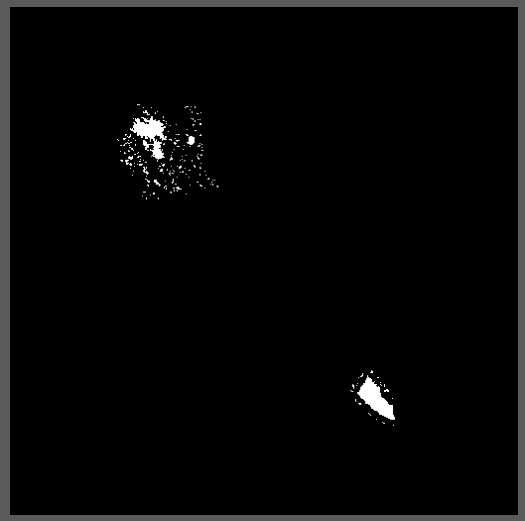
(d) bottleneck



(e) densenet comb

Ex6

(a) Input

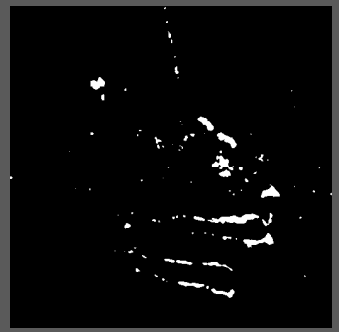


(b) GT

(a) early

(b) late

(c) densenet

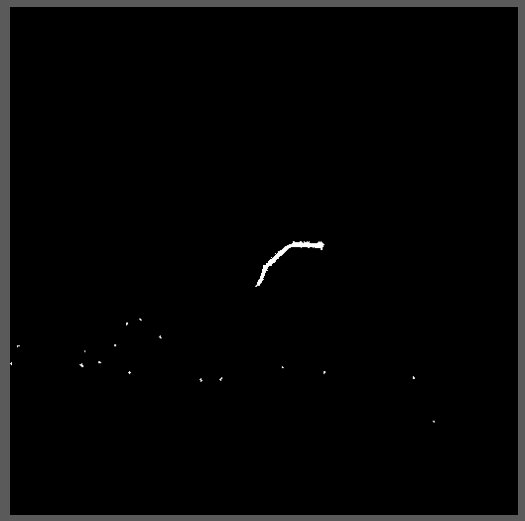


(d) bottleneck

(e) densenet comb

Ex7

(a) Input

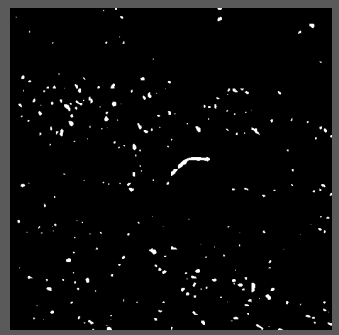


(b) GT

(a) early

(b) late

(c) densenet

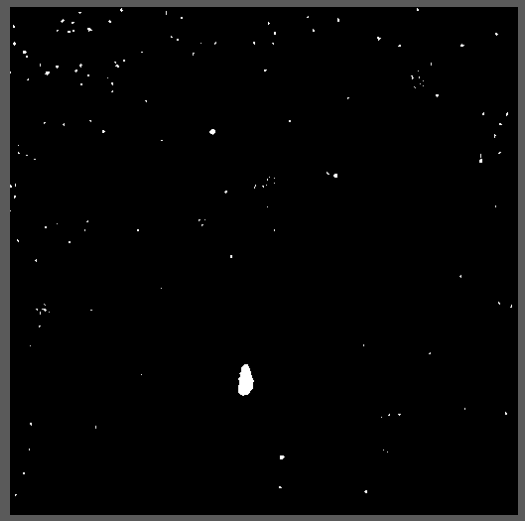


(d) bottleneck

(e) densenet comb

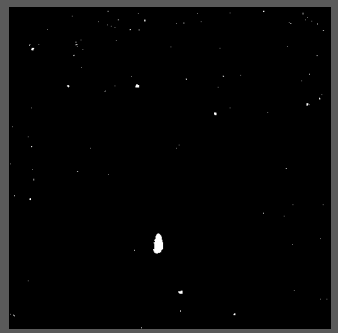
Ex8

(a) Input



(b) GT

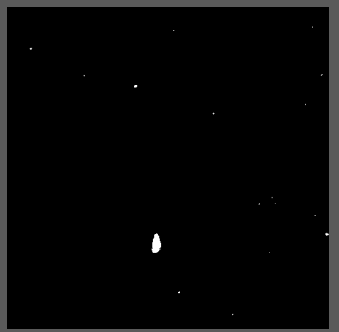
(a) early



(b) late

(c) densenet

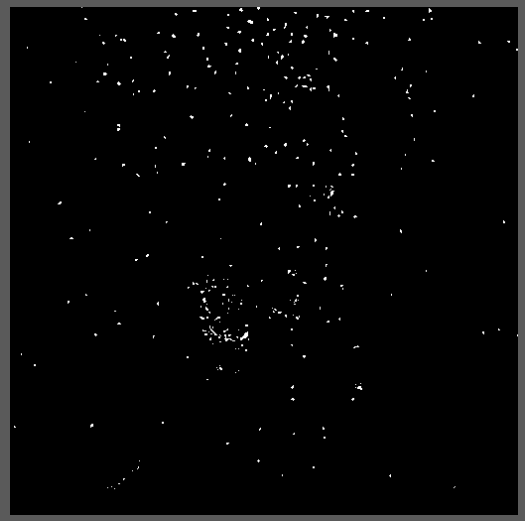
(d) bottleneck



(e) densenet comb

Ex9

(a) Input



(b) GT

(a) early

(b) late

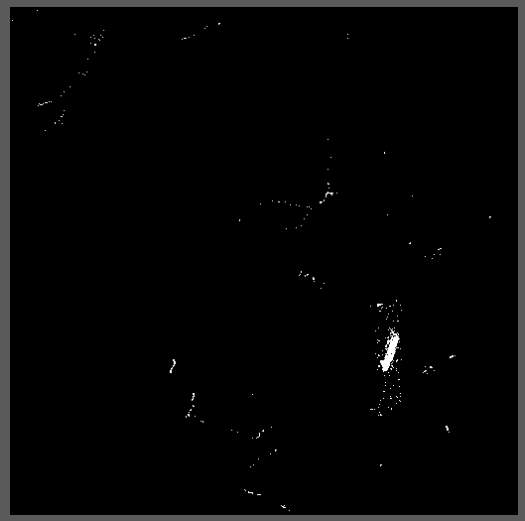
(c) densenet

(d) bottleneck

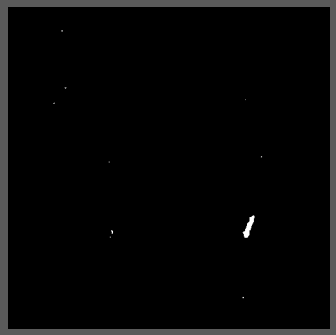
(e) densenet comb

Ex10

(a) Input

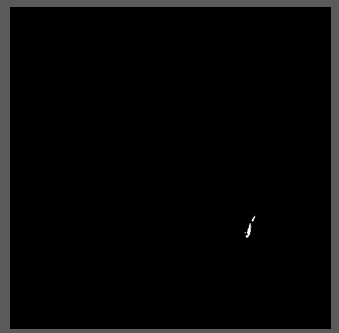


(b) GT



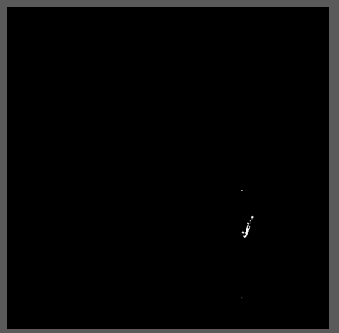
(a) early

(b) late



(c) densenet

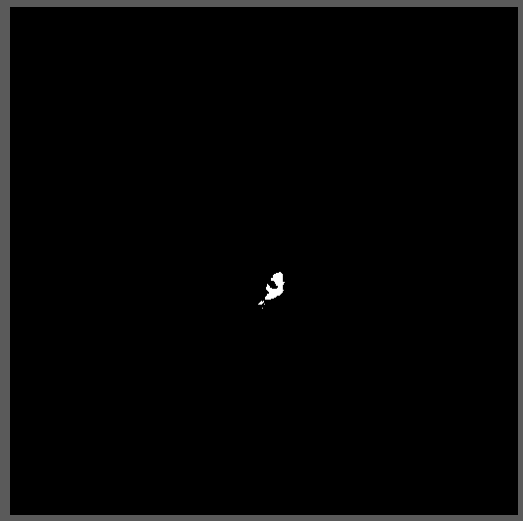
(d) bottleneck



(e) densenet comb

Ex11

(a) Input



(b) GT

(a) early

(b) late

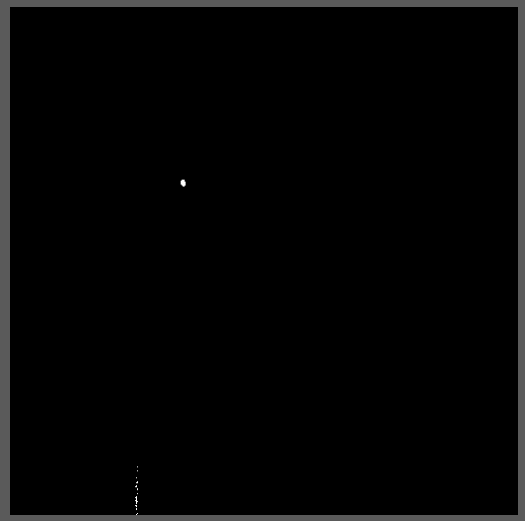
(c) densenet

(d) bottleneck

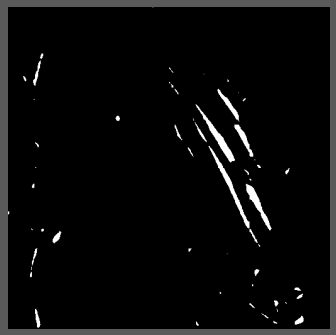
(e) densenet comb

Ex12

(a) Input



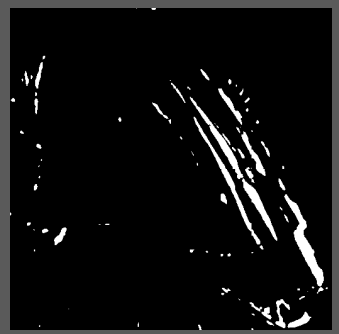
(b) GT



(a) early

(b) late

(c) densenet

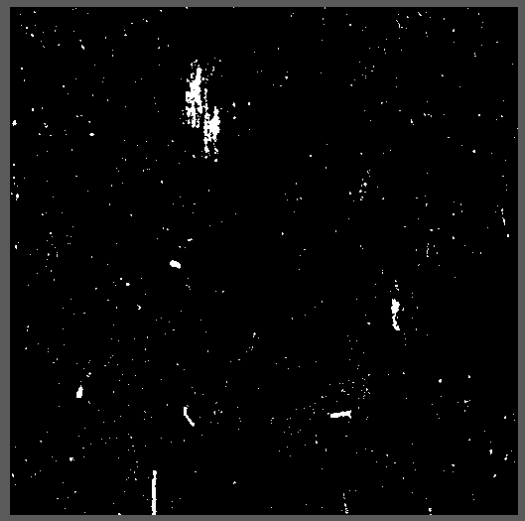


(d) bottleneck

(e) densenet comb

Ex13

(a) Input



(b) GT

(a) early

(b) late

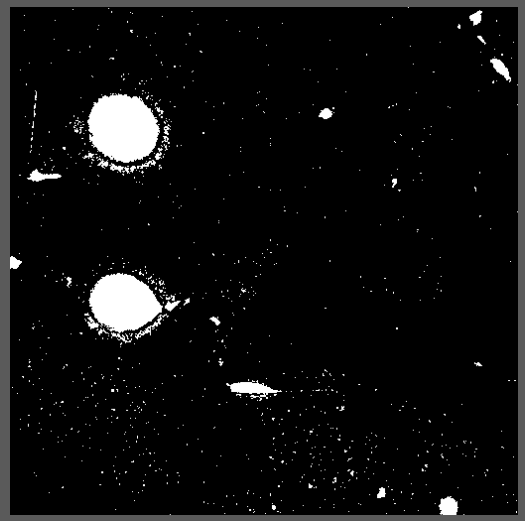
(c) densenet

(d) bottleneck

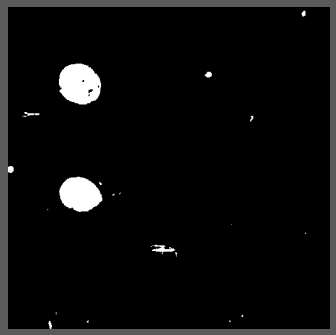
(e) densenet comb

Ex14

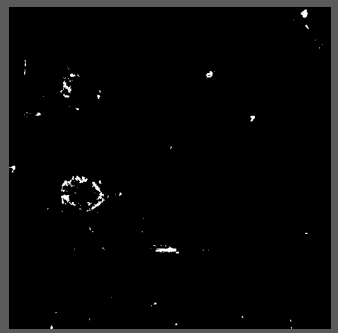
(a) Input



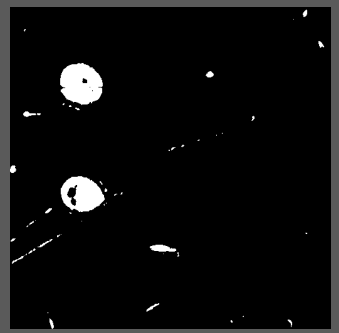
(b) GT



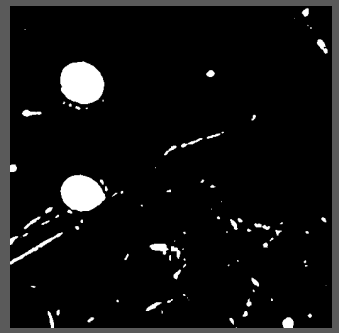
(a) early



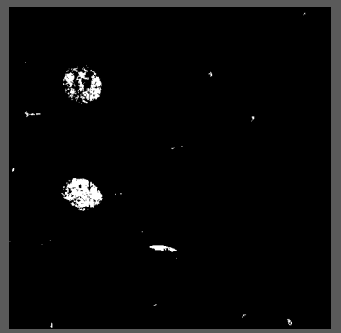
(b) late



(c) densenet



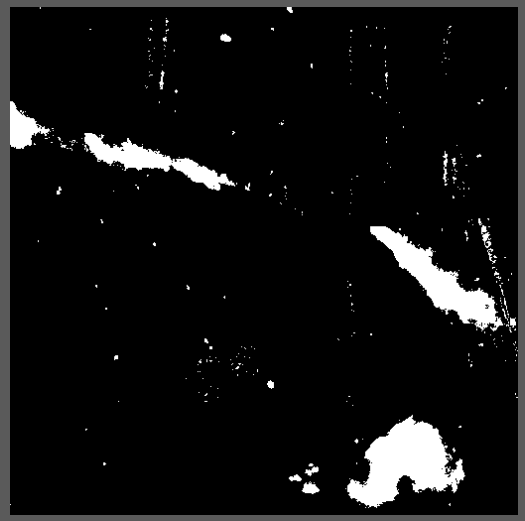
(d) bottleneck



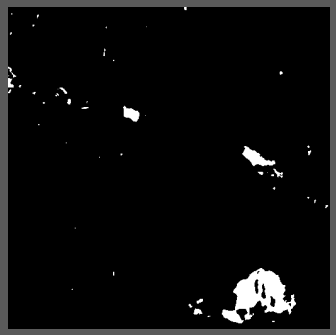
(e) densenet comb

Ex15

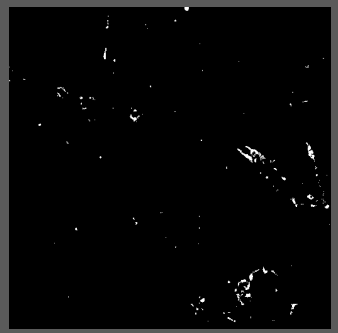
(a) Input



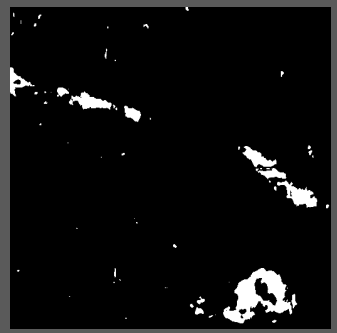
(b) GT



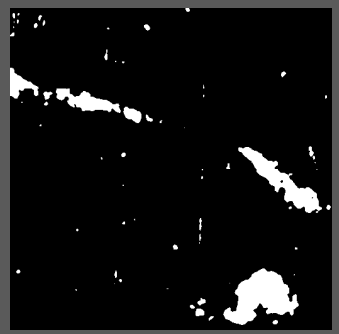
(a) early



(b) late



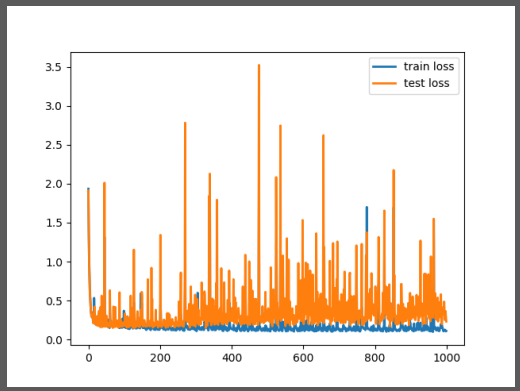
(c) densenet



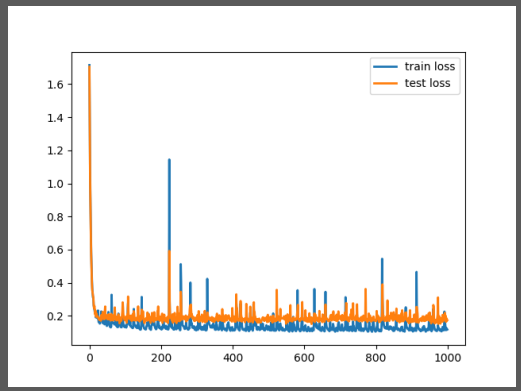
(d) bottleneck

(e) densenet comb

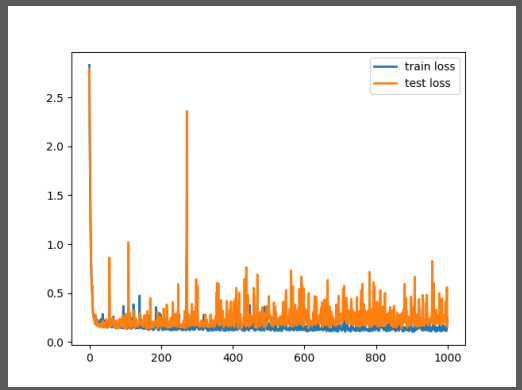
Trainingsloss



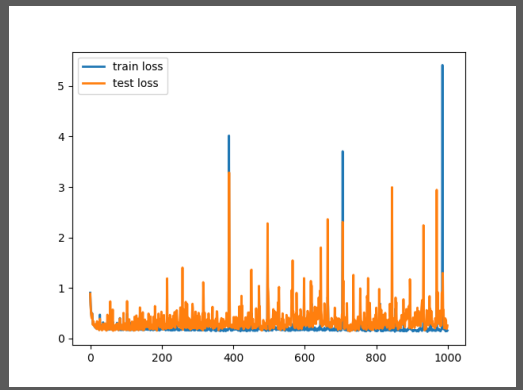
(a) early



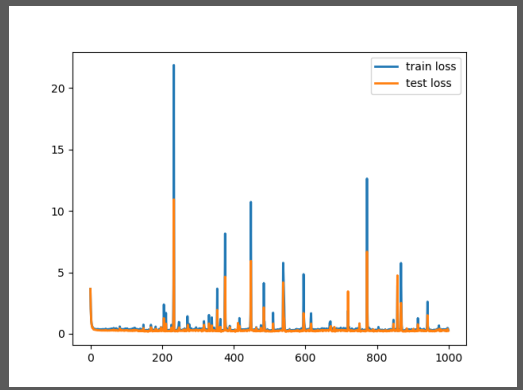
(b) late



(c) densenet

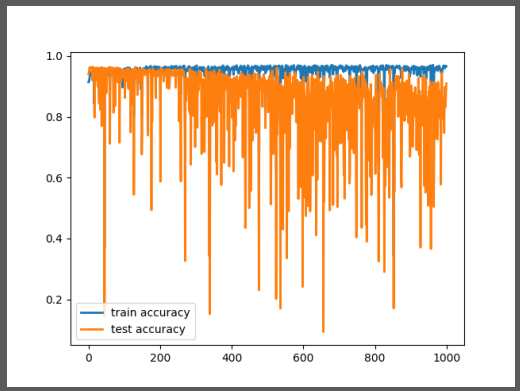


(d) bottleneck

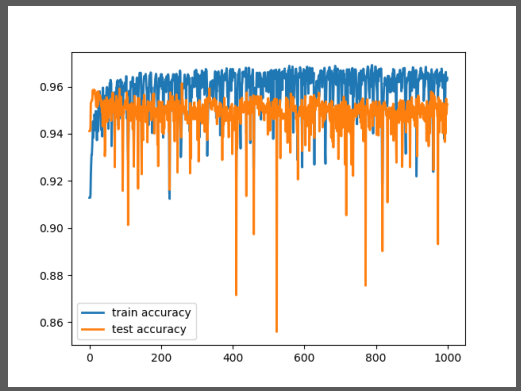


(e) densenet comb

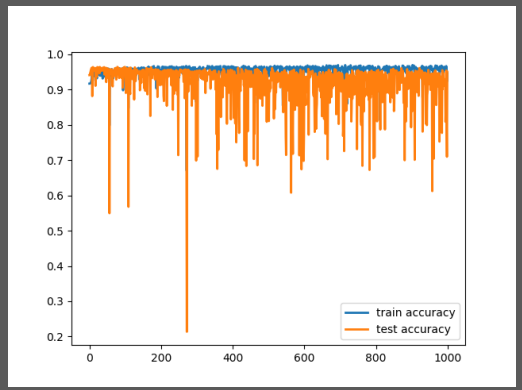
Accuracy



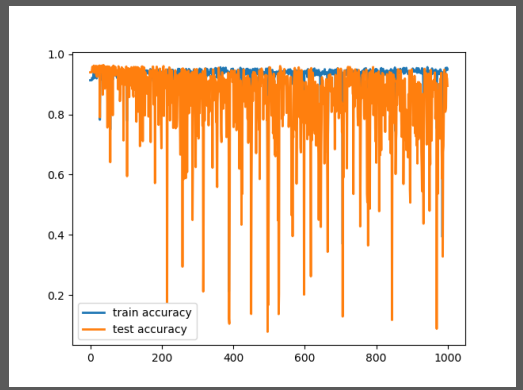
(a) early



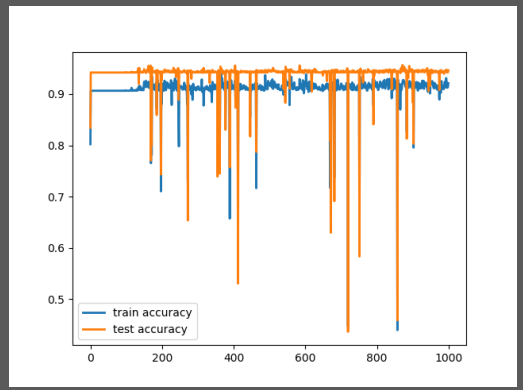
(b) late



(c) densenet



(d) bottleneck

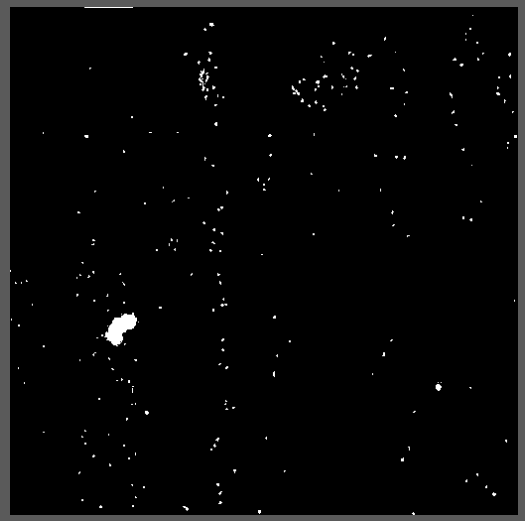


(e) densenet comb

Test evaluation on 512x512 patches

Ex1

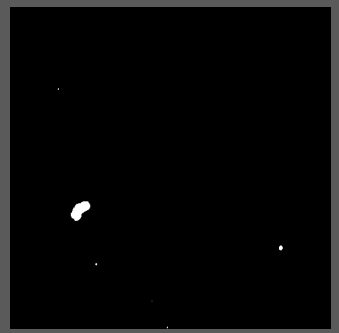
(a) Input



(b) GT

(a) early

(b) late

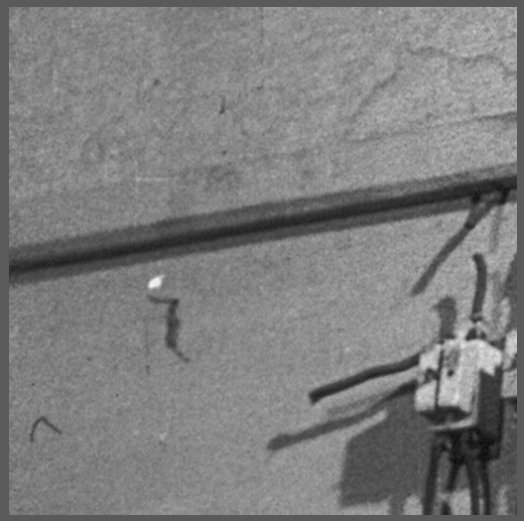


(c) densenet

(d) bottleneck

(e) densenet comb

Ex2



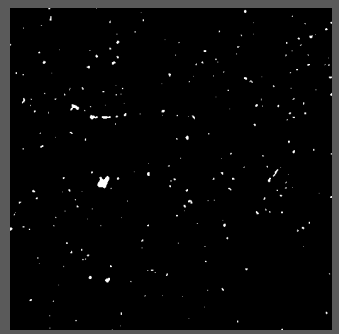
(a) Input

(b) GT

(a) early

(b) late

(c) densenet

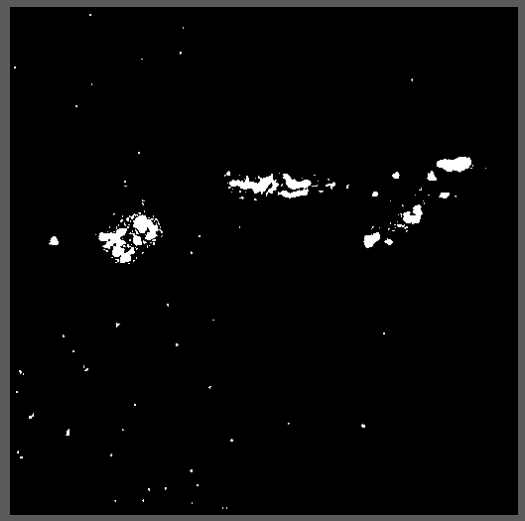


(d) bottleneck

(e) densenet comb

Ex3

(a) Input

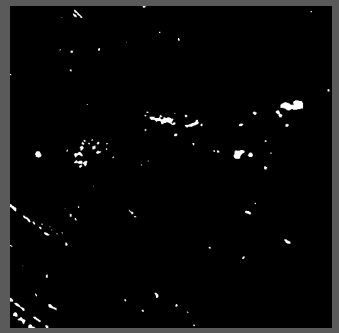


(b) GT

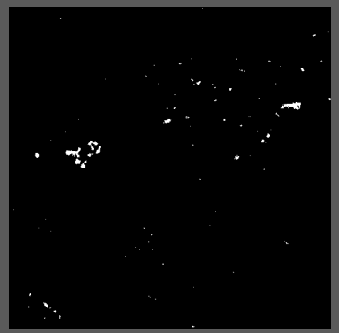
(a) early

(b) late

(c) densenet



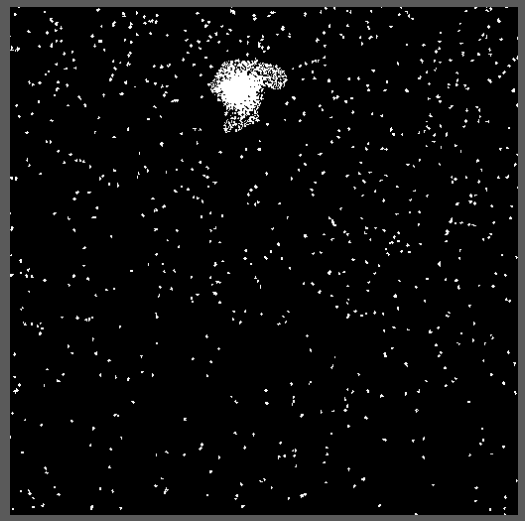
(d) bottleneck



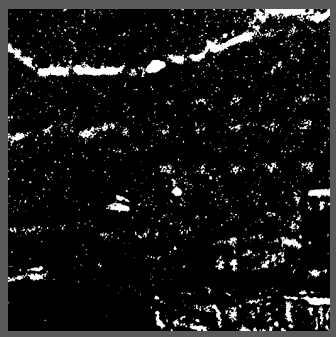
(e) densenet comb

Ex4

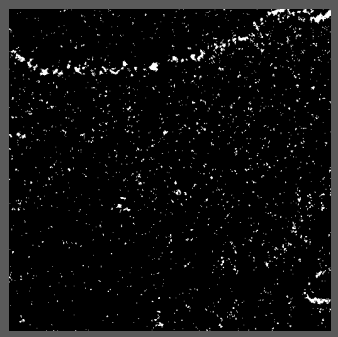
(a) Input



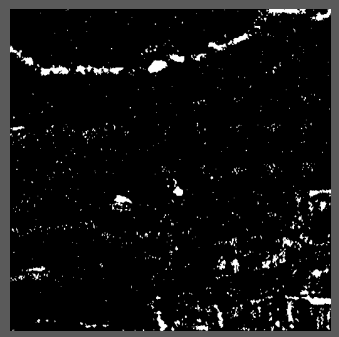
(b) GT



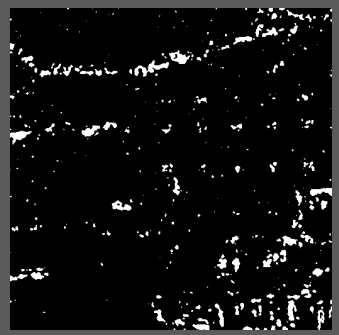
(a) early



(b) late



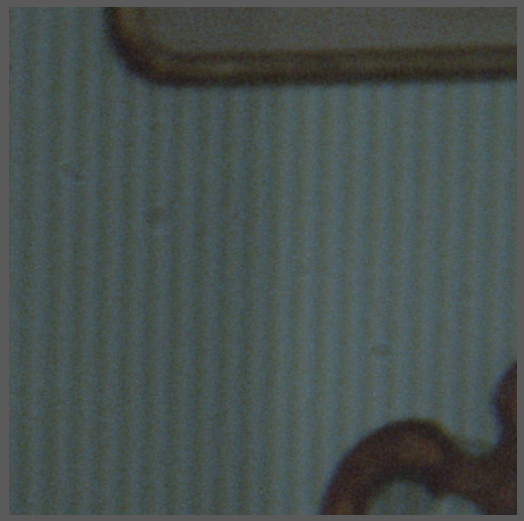
(c) densenet



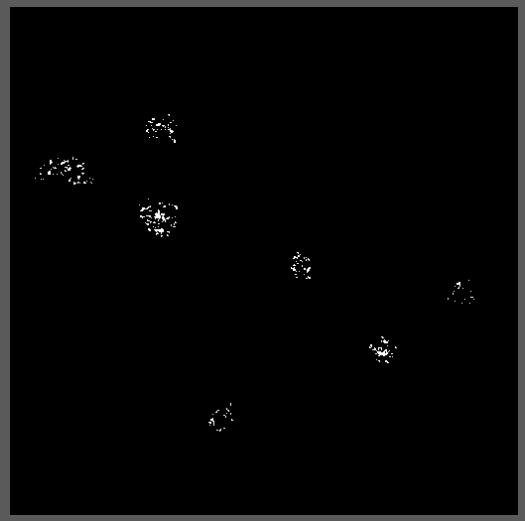
(d) bottleneck

(e) densenet comb

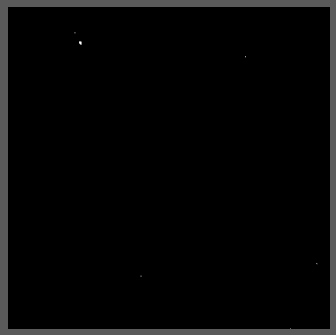
Ex5



(a) Input

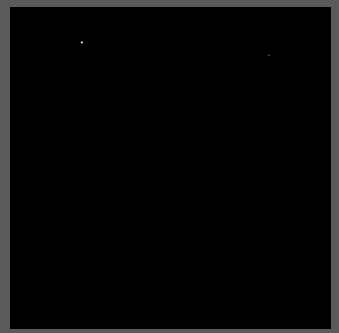


(b) GT



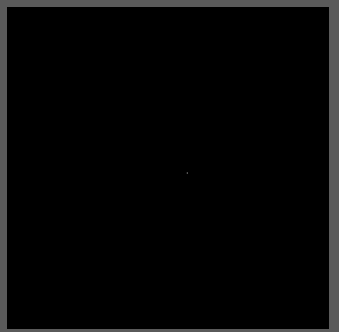
(a) early

(b) late



(c) densenet

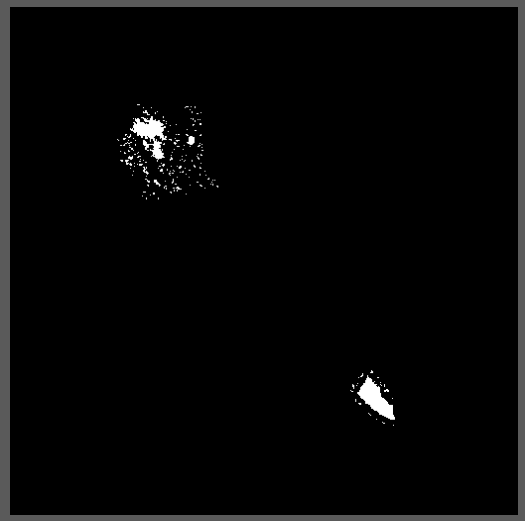
(d) bottleneck



(e) densenet comb

Ex6

(a) Input

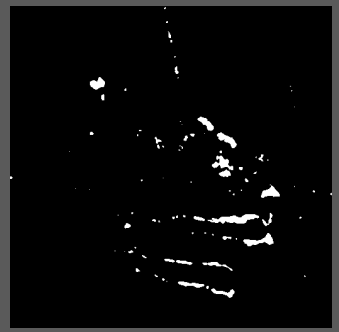


(b) GT

(a) early

(b) late

(c) densenet

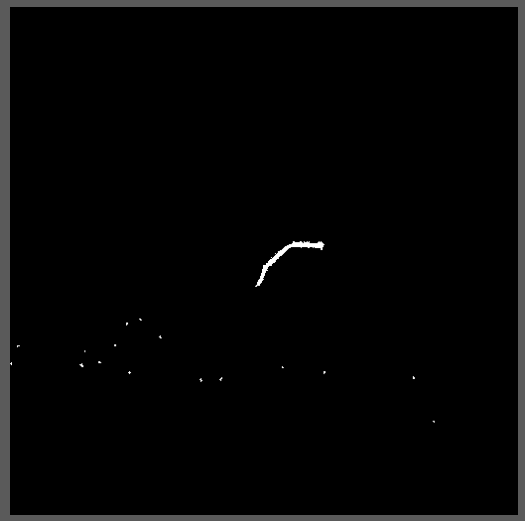


(d) bottleneck

(e) densenet comb

Ex7

(a) Input

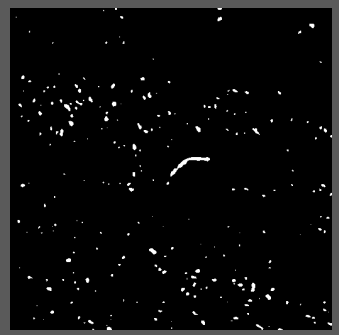


(b) GT

(a) early

(b) late

(c) densenet

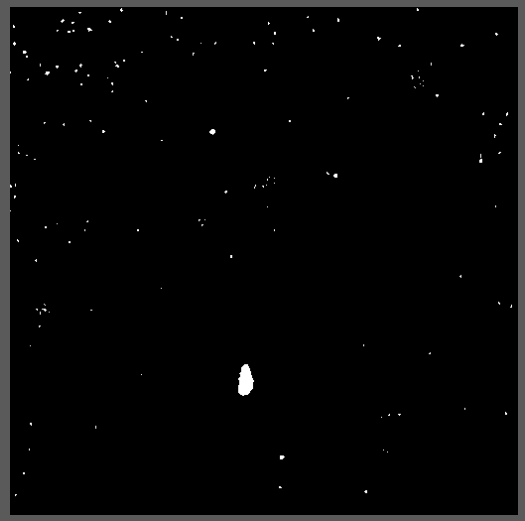


(d) bottleneck

(e) densenet comb

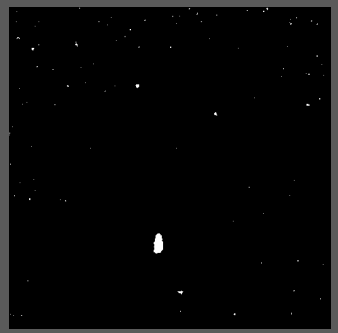
Ex8

(a) Input



(b) GT

(a) early



(b) late

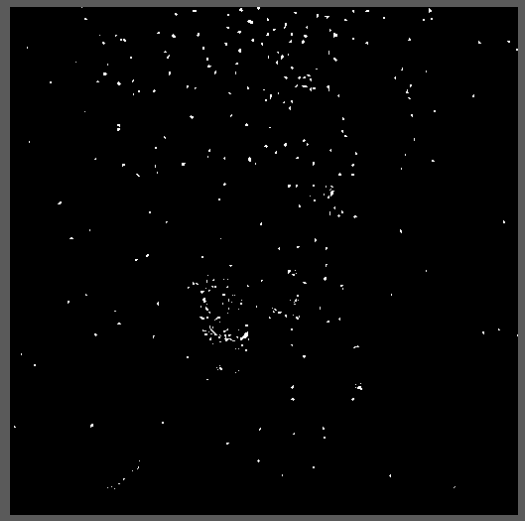
(c) densenet

(d) bottleneck

(e) densenet comb

Ex9

(a) Input



(b) GT

(a) early

(b) late

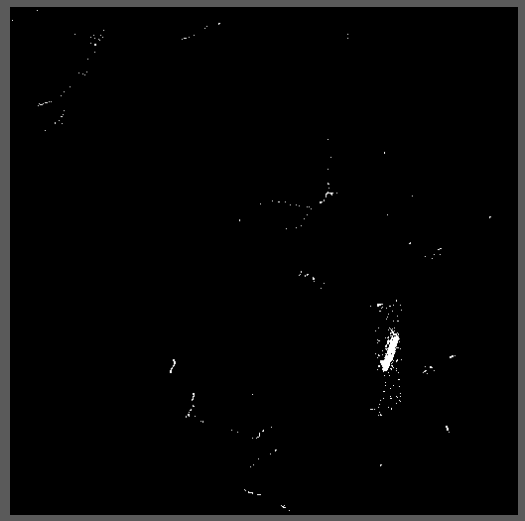
(c) densenet

(d) bottleneck

(e) densenet comb

Ex10

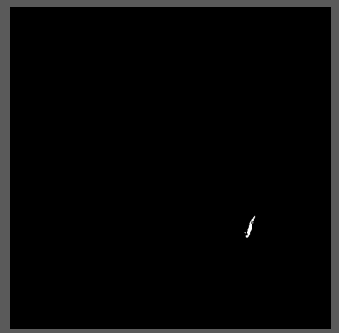
(a) Input



(b) GT

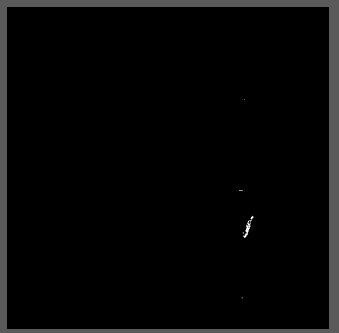
(a) early

(b) late



(c) densenet

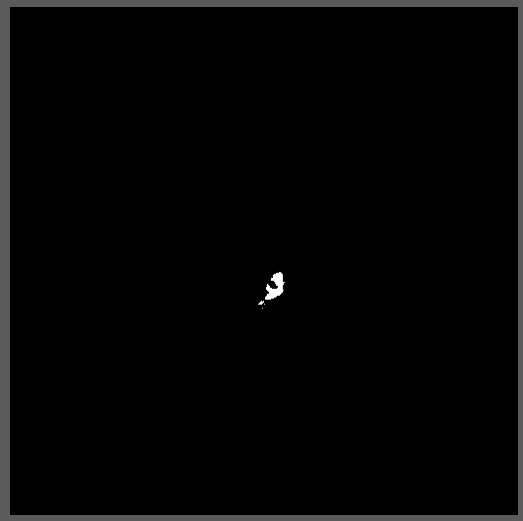
(d) bottleneck



(e) densenet comb

Ex11

(a) Input



(b) GT

(a) early

(b) late

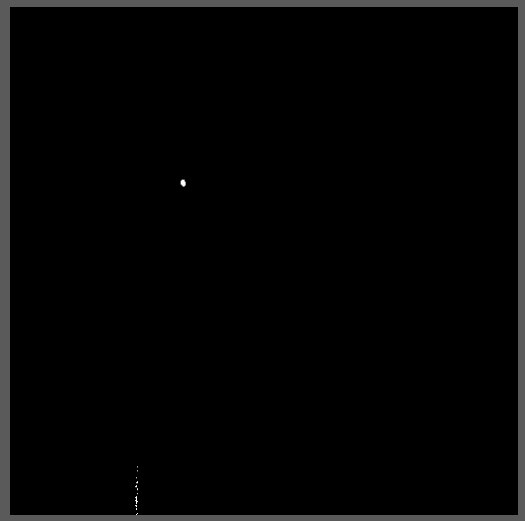
(c) densenet

(d) bottleneck

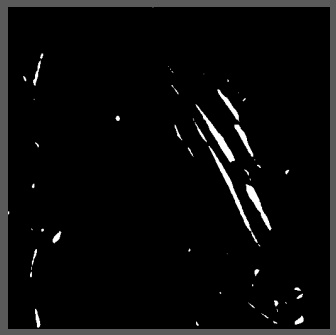
(e) densenet comb

Ex12

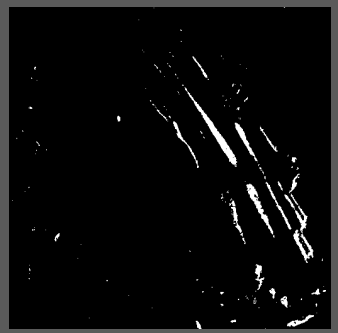
(a) Input



(b) GT

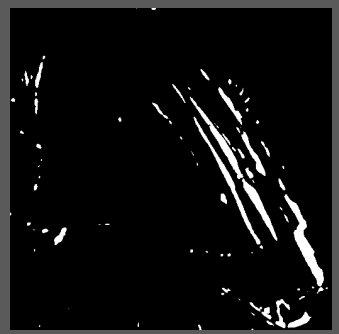


(a) early



(b) late

(c) densenet

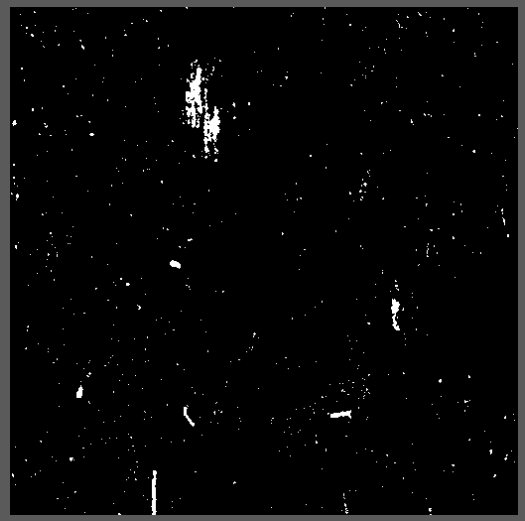


(d) bottleneck

(e) densenet comb

Ex13

(a) Input



(b) GT

(a) early

(b) late

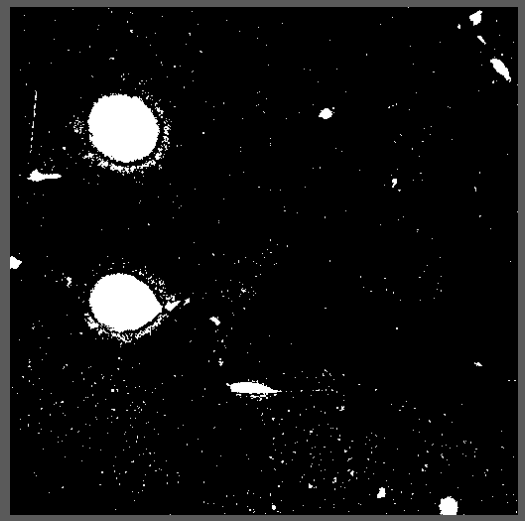
(c) densenet

(d) bottleneck

(e) densenet comb

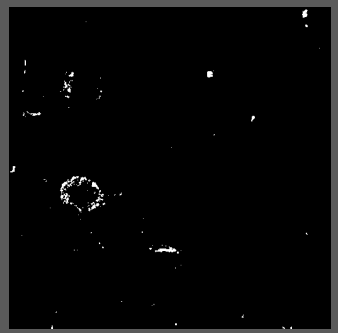
Ex14

(a) Input

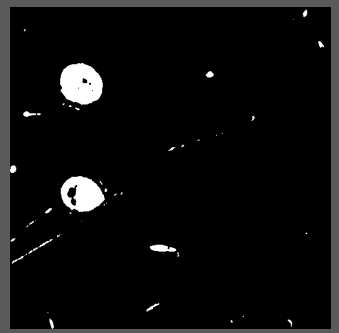


(b) GT

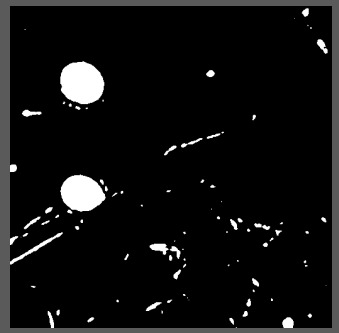
(a) early



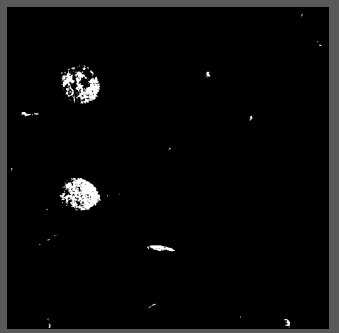
(b) late



(c) densenet



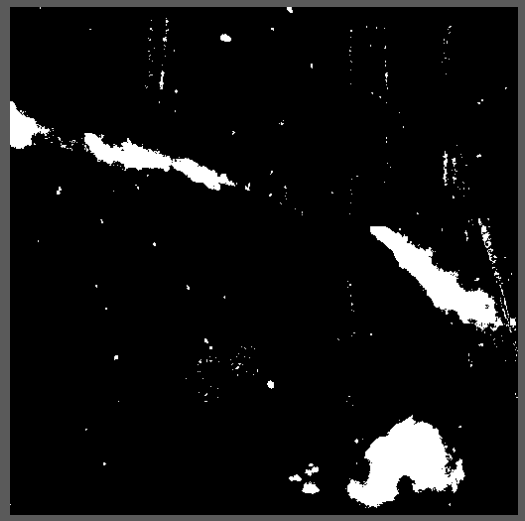
(d) bottleneck



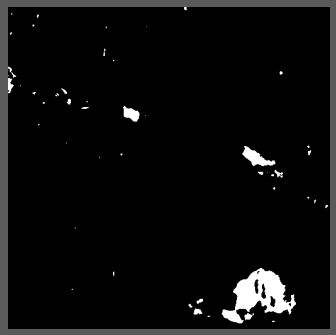
(e) densenet comb

Ex15

(a) Input

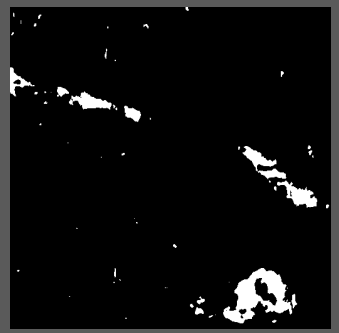


(b) GT

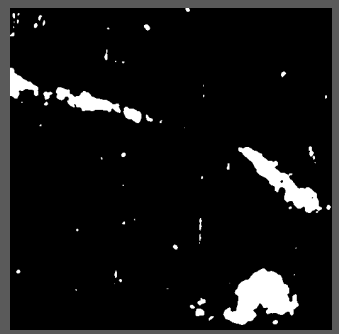


(a) early

(b) late

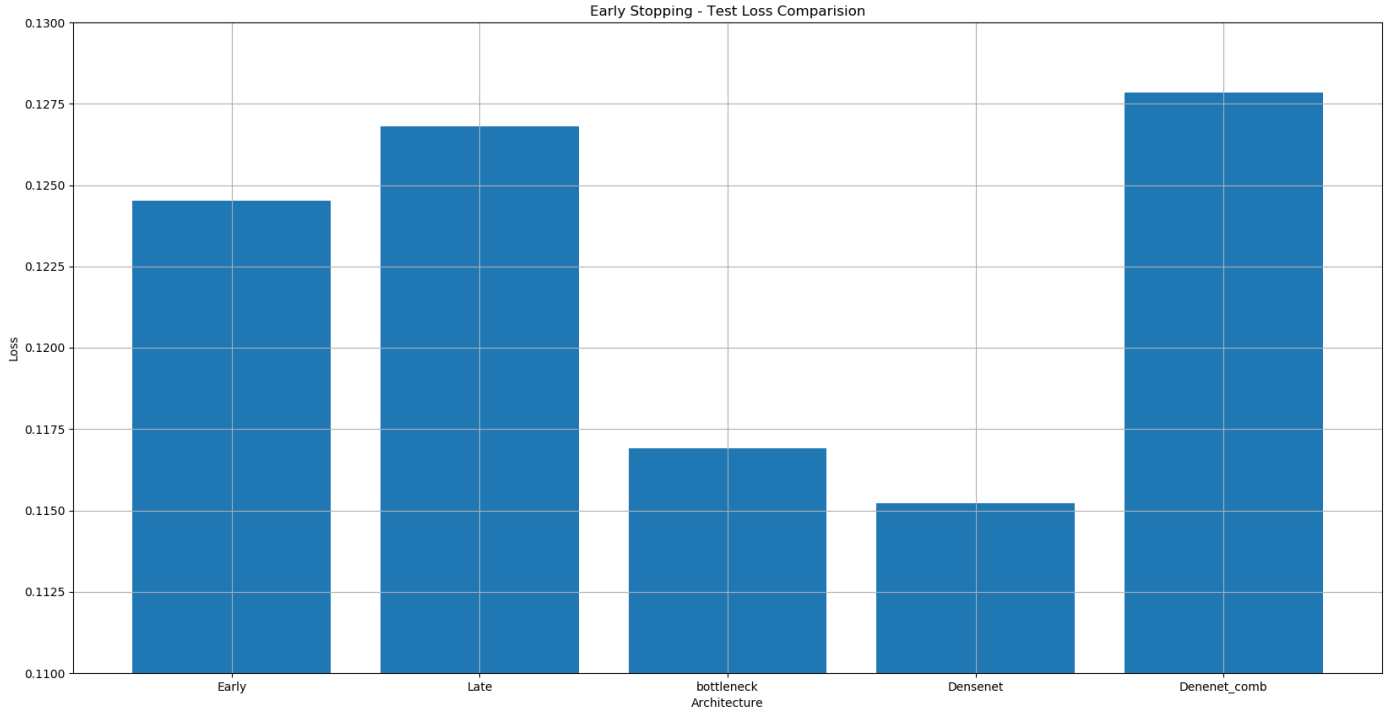


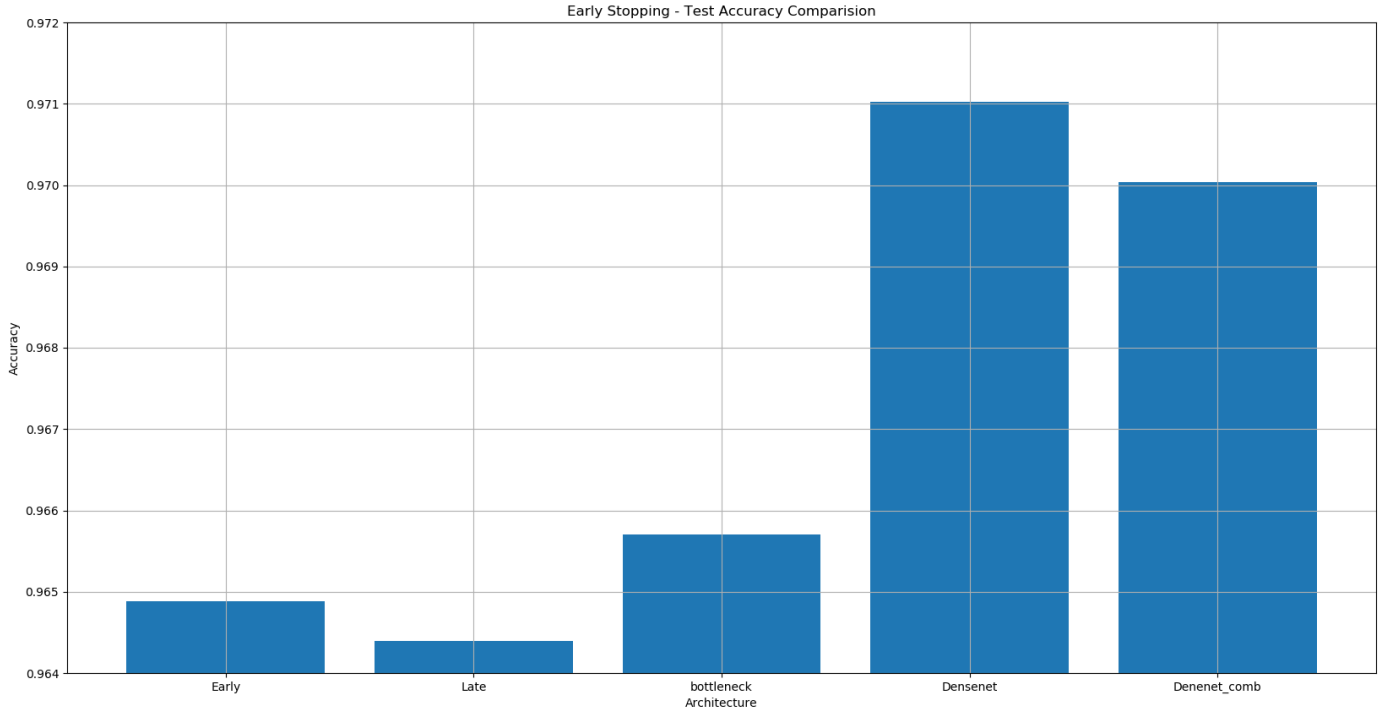
(c) densenet

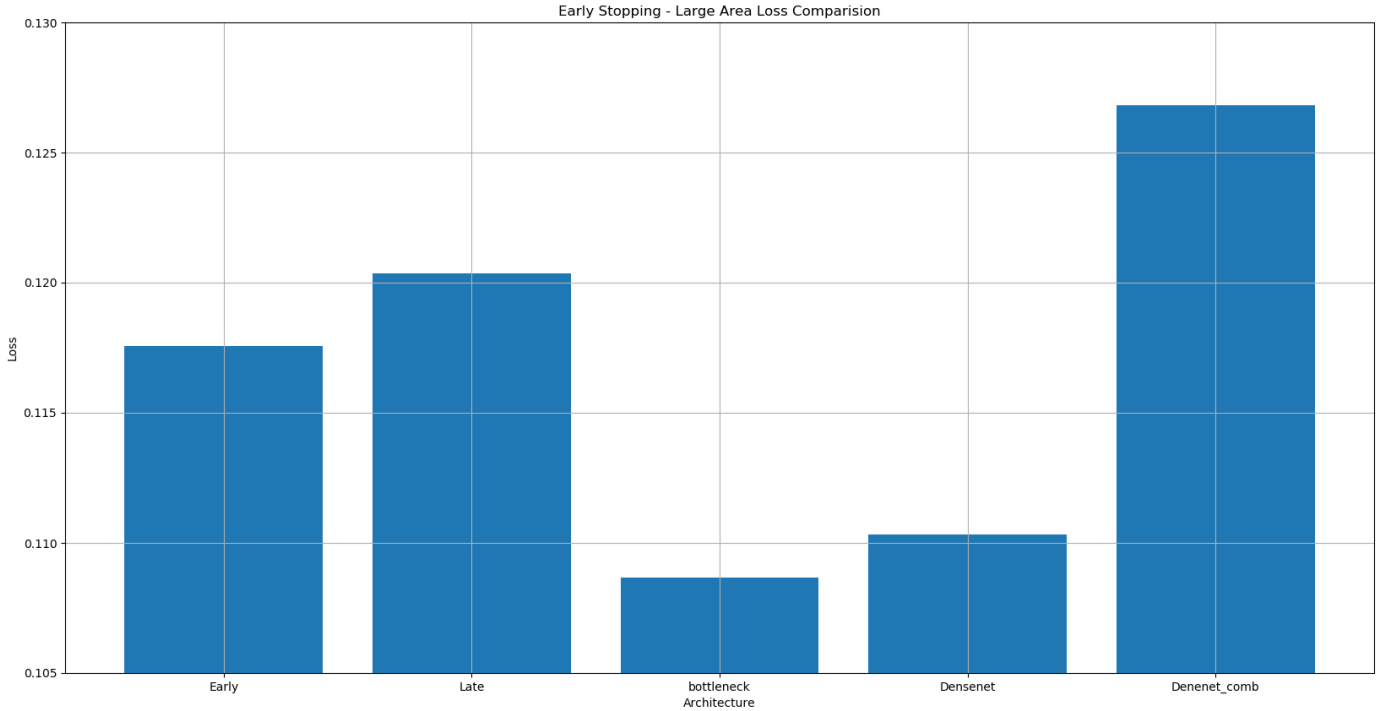


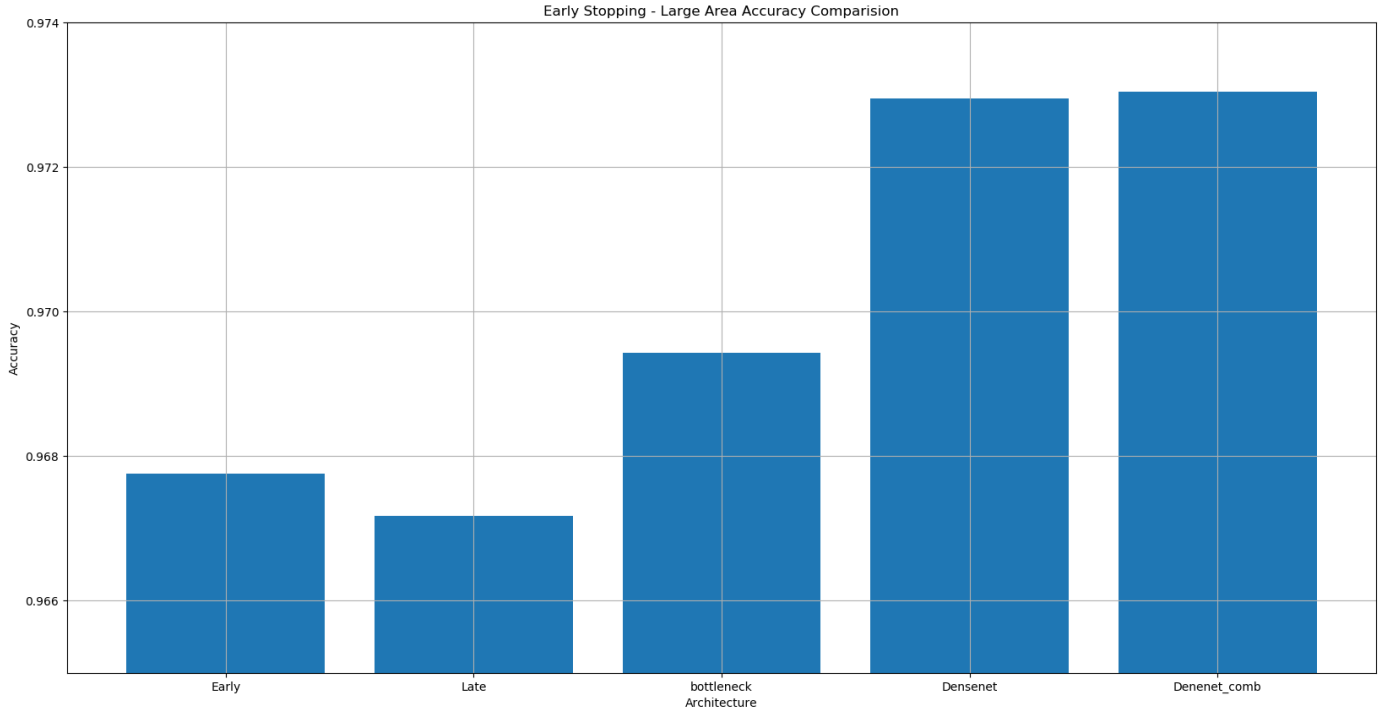
(d) bottleneck

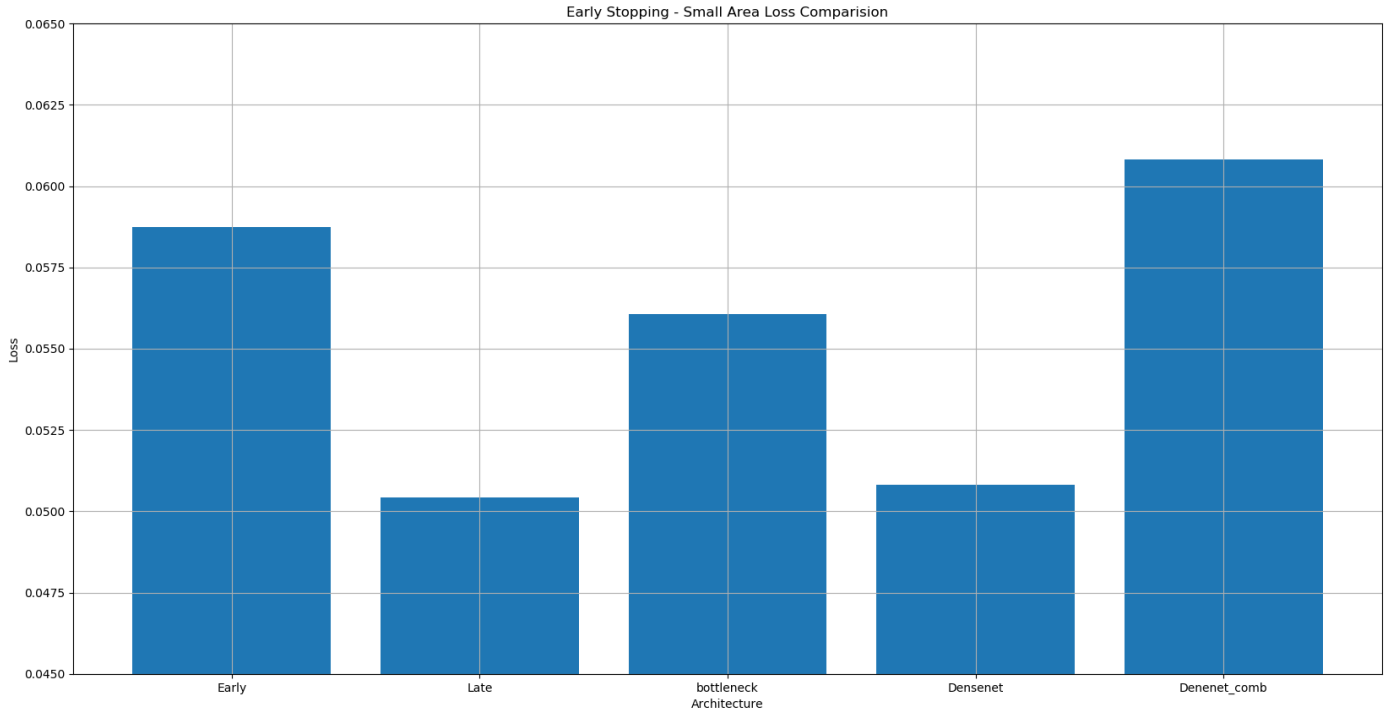
(e) densenet comb

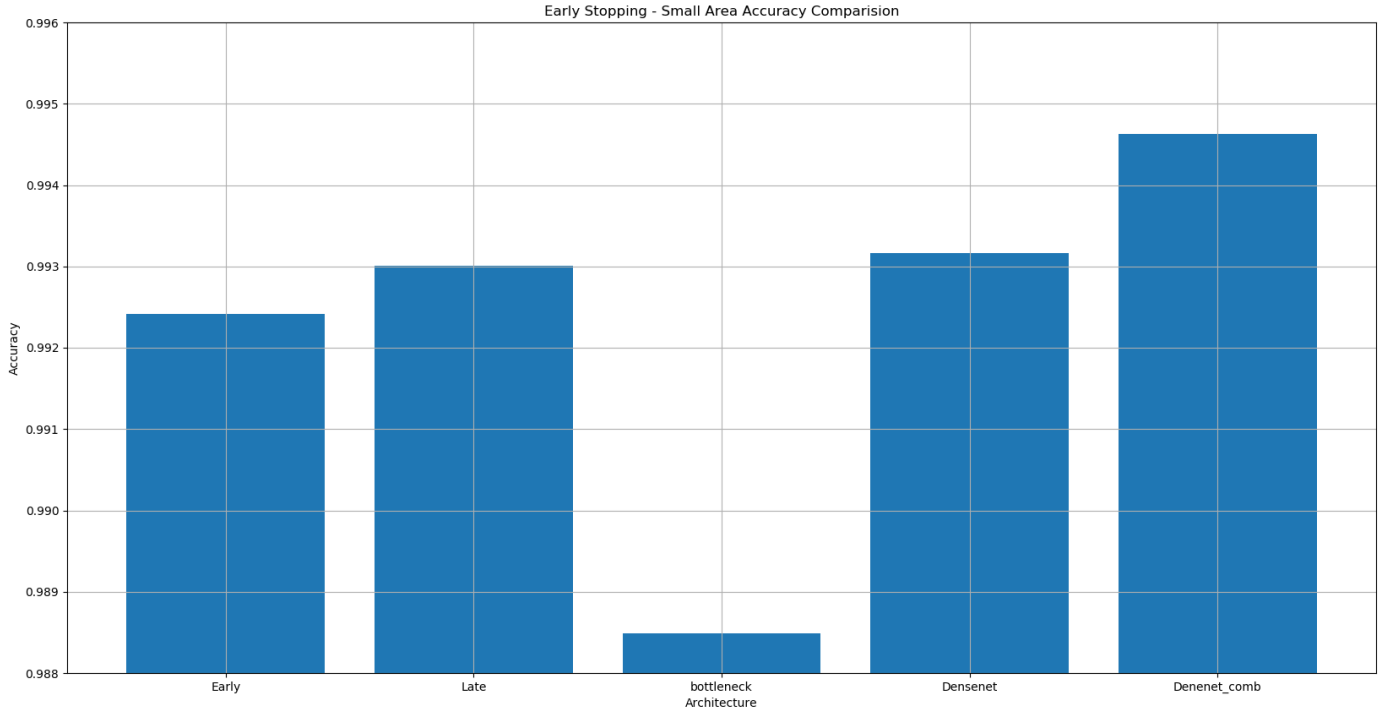

Early Stopping - Test Loss Comparision
0.1300
0.1275
0.1250
0.1225
0.1200
0.1175
0.1150
0.1125
0.1100
Loss
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture

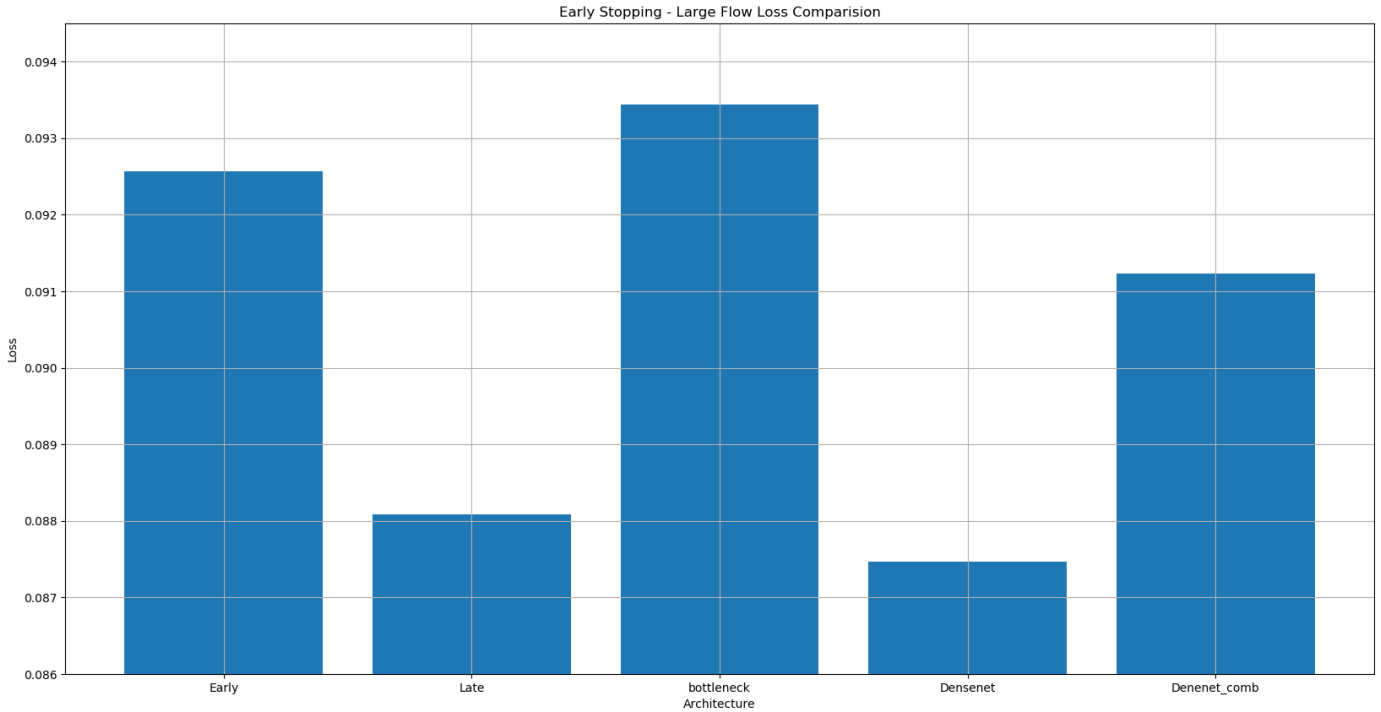

Early Stopping - Test Accuracy Comparision
0.972
0.971
0.970
0.969
0.968
0.967
0.966
0.965
0.964
Accuracy
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture

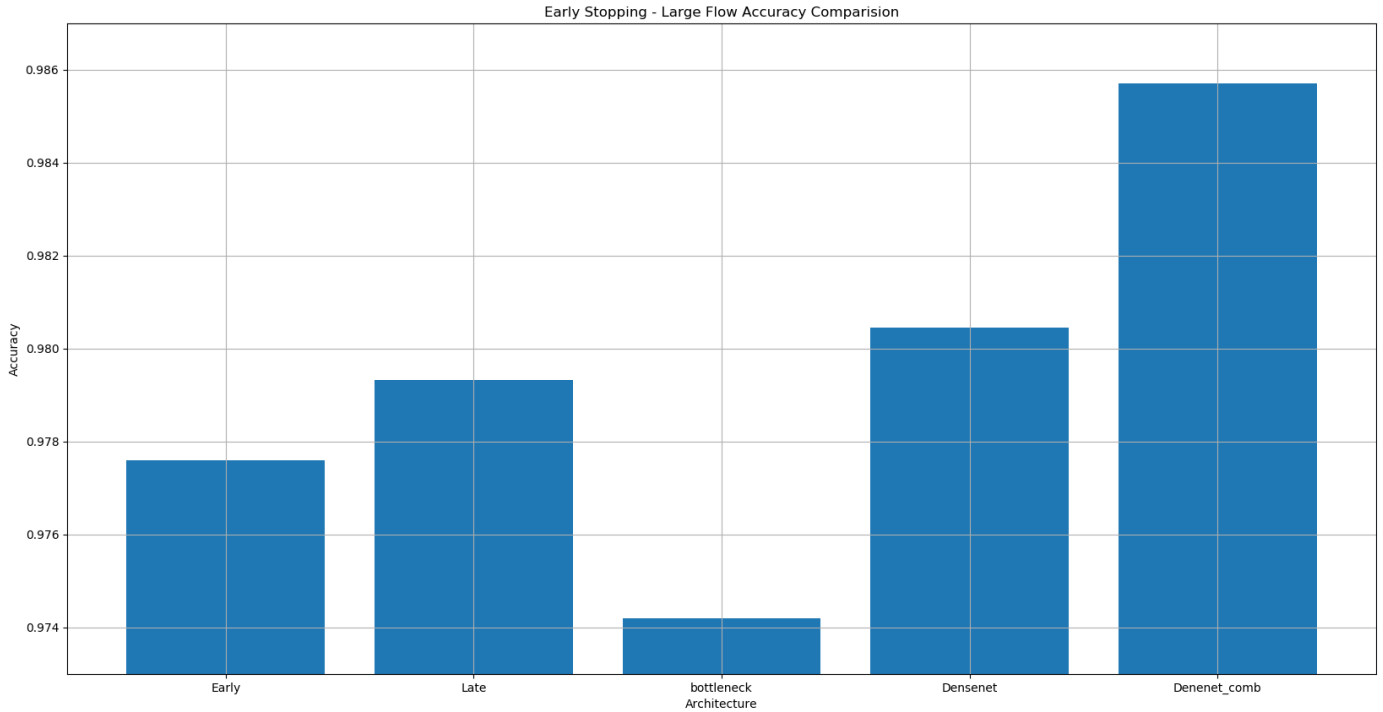

Early Stopping - Large Area Loss Comparision
0.130
0.125
0.120
0.115
0.110
0.105
Loss
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture

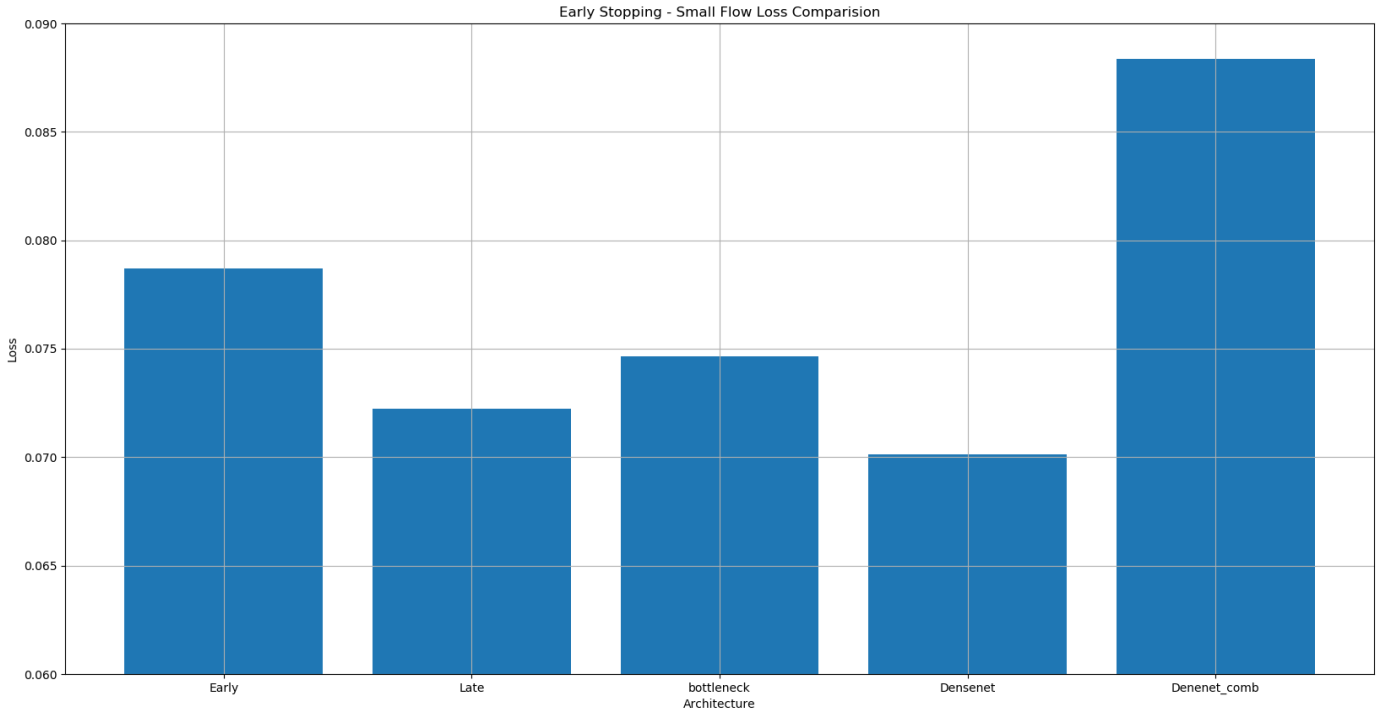

Early Stopping - Large Area Accuracy Comparision
0.974
0.972
0.970
0.968
0.966
Accuracy
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture

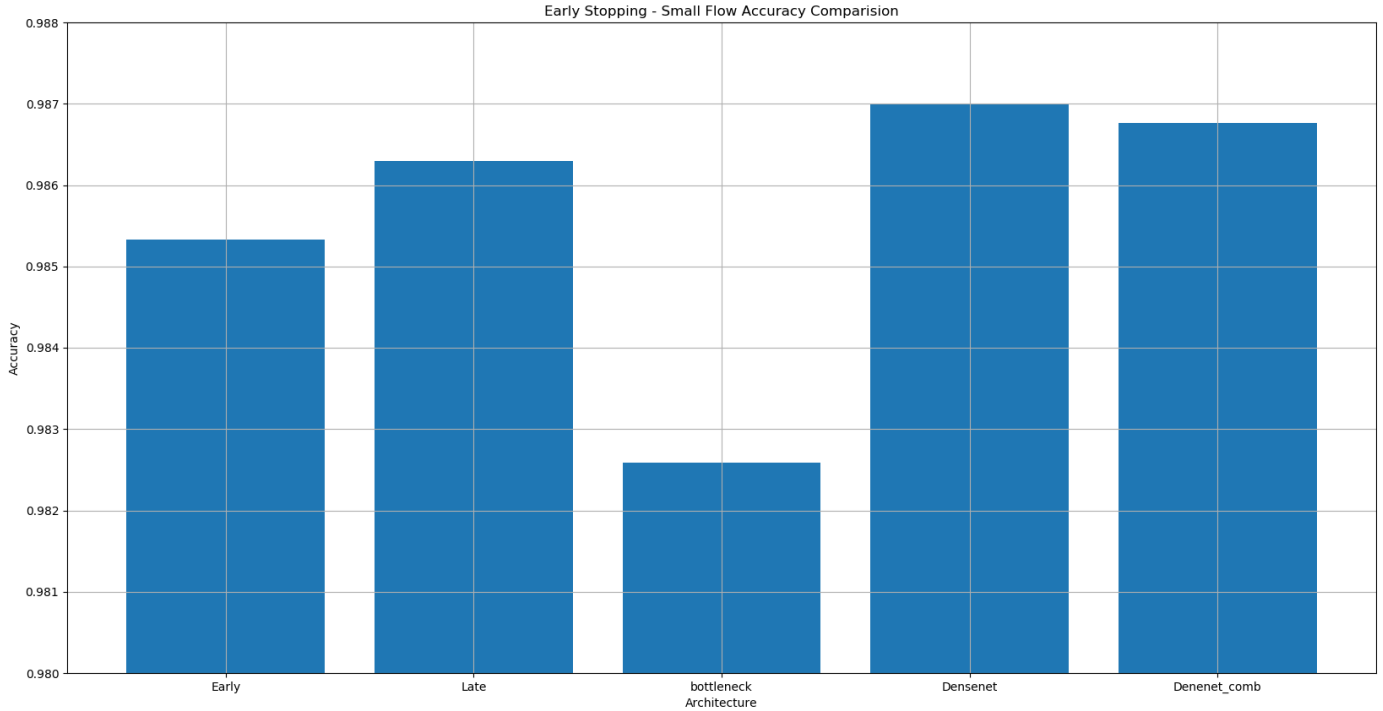

Early Stopping - Small Area Loss Comparision
0.0650
0.0625
0.0600
0.0575
0.0550
0.0525
0.0500
0.0475
0.0450
Loss
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture


Early Stopping - Small Area Accuracy Comparision
0.996
0.995
0.994
0.993
0.992
0.991
0.990
0.989
0.988
Accuracy
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture


Early Stopping - Large Flow Loss Comparision
Loss
0.094
0.093
0.092
0.091
0.090
0.089
0.088
0.087
0.086
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture


Early Stopping - Large Flow Accuracy Comparision
Accuracy
0.986
0.984
0.982
0.980
0.978
0.976
0.974
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture


Early Stopping - Small Flow Loss Comparision
0.090
0.085
0.080
0.075
0.070
0.065
0.060
Loss
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture


Early Stopping - Small Flow Accuracy Comparision
0.988
0.987
0.986
0.985
0.984
0.983
0.982
0.981
0.980
Accuracy
Early
Late
bottleneck
Densenet
Denenet_comb
Architecture