

# Deep Restore

## Architecture Comparision Server

October 5, 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
- ▶ input normalization
- ▶ learning rate 0.001, weight decay 0.001, batch momentum 0.9

# Early Combine

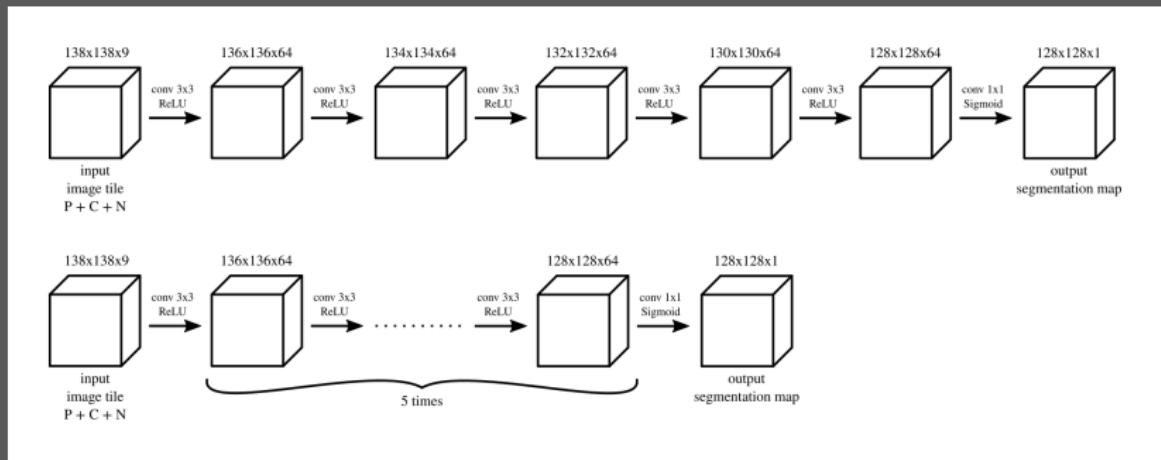


Figure: Early

# Late Combine

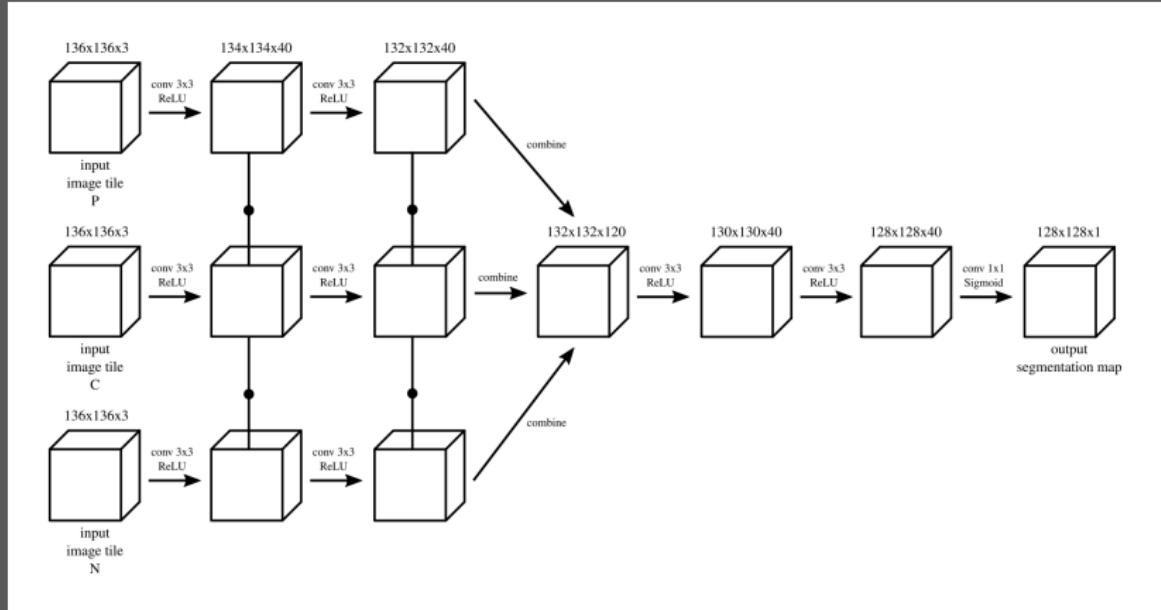


Figure: Late

# Densenet

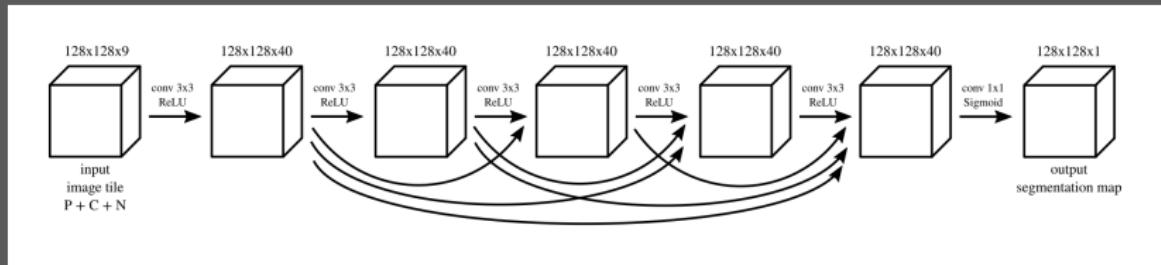


Figure: densenet

# Bottleneck

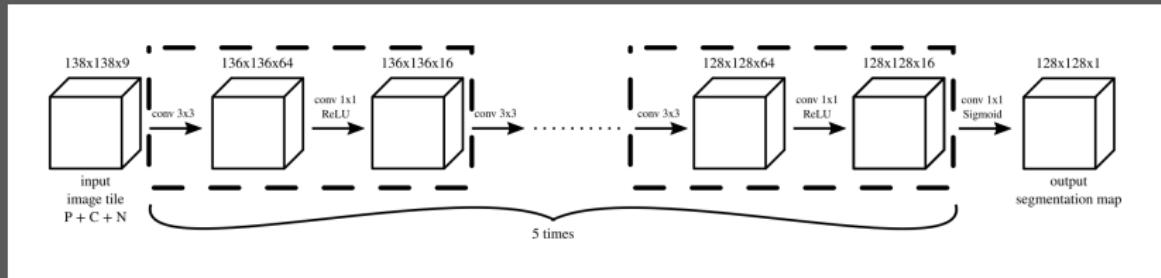


Figure: Bottleneck

# Densenet combined

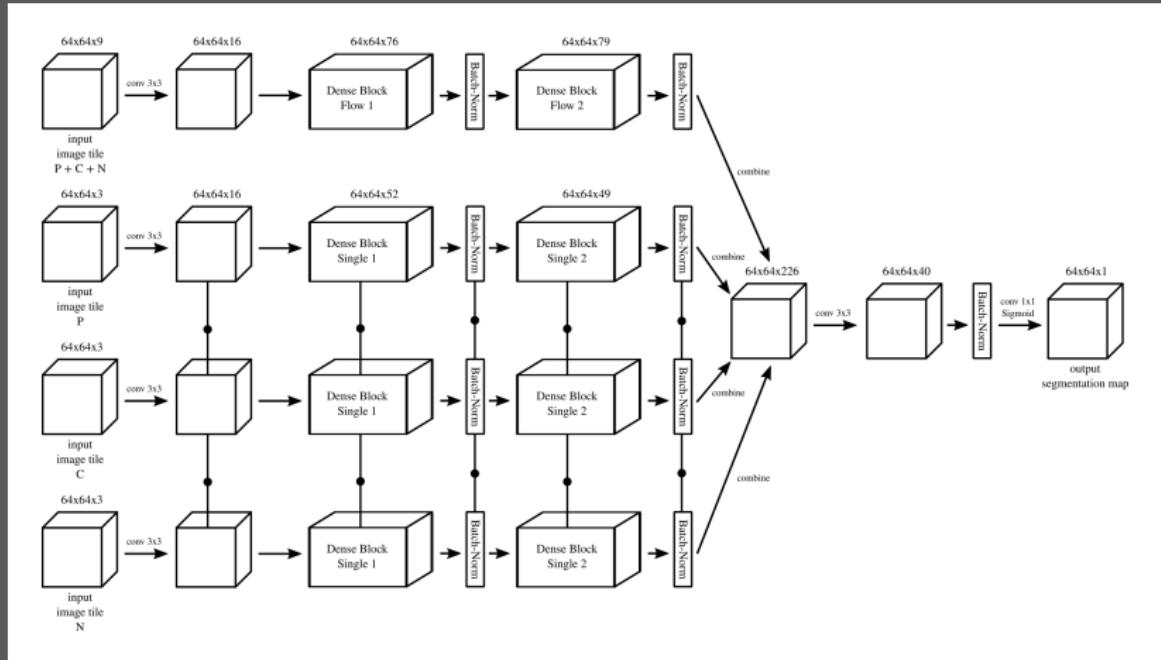


Figure: Densenet combined

# Densenet combined2

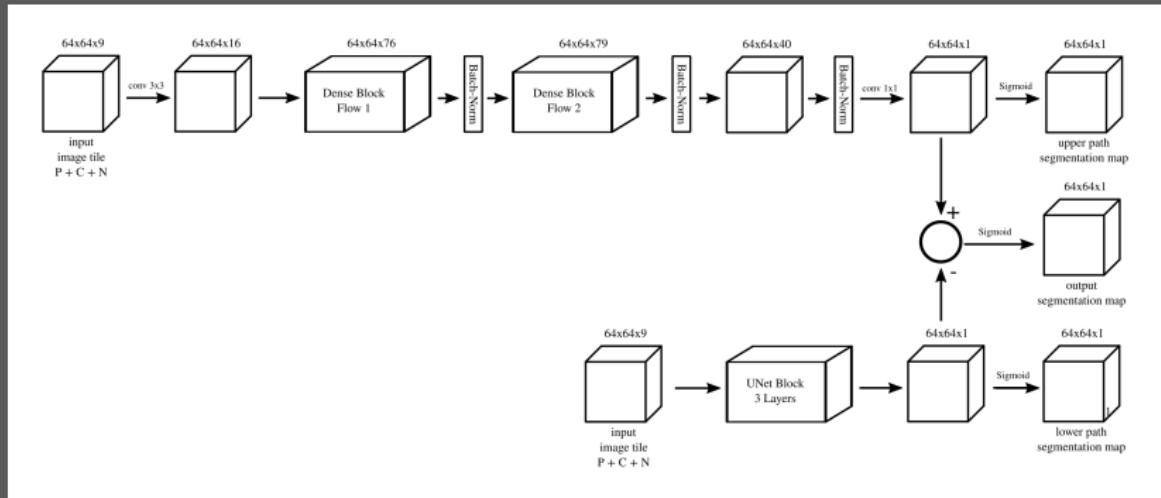


Figure: Densenet combined2

# Train - Ex1

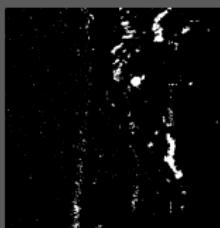


(a) Input

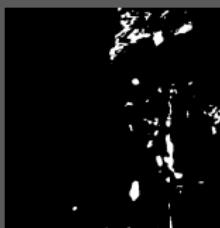
(b) GT



(a) early



(b) late



(c) densenet



(d)



(e) densenet



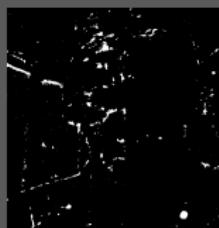
(f) densenet

## Train - Ex2



(a) Input

(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

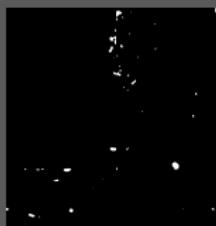
(f) densenet

# Train - Ex3



(a) Input

(b) GT



(a) early



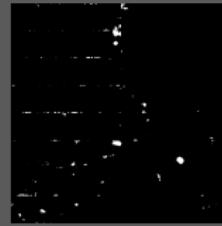
(b) late



(c) densenet



(d)



(e) densenet



(f) densenet

# Train - Ex4

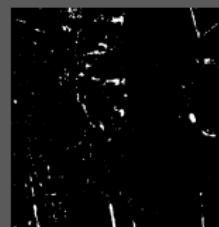


(a) Input

(b) GT



(a) early



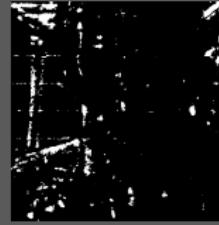
(b) late



(c) densenet



(d)



(e) densenet



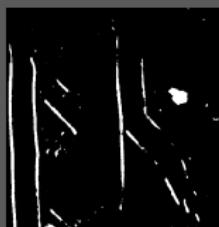
(f) densenet

# Train - Ex5

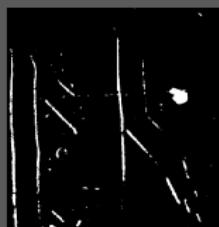


(a) Input

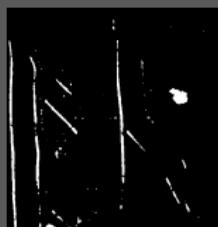
(b) GT



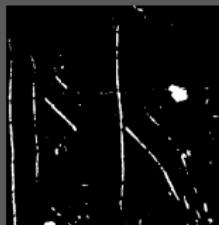
(a) early



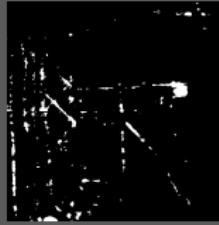
(b) late



(c) densenet



(d)

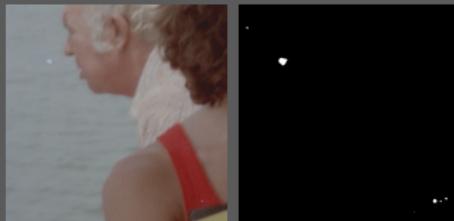


(e) densenet

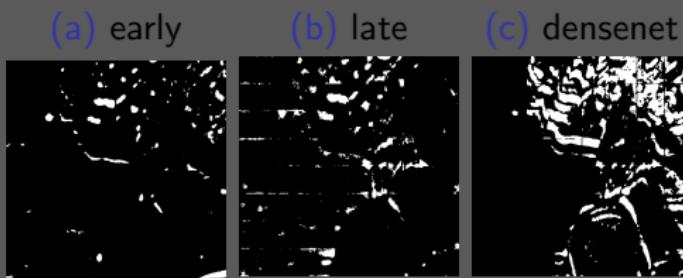
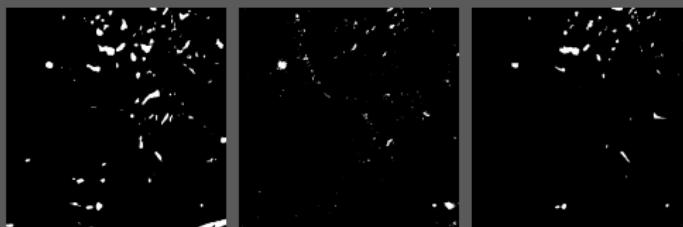


(f) densenet

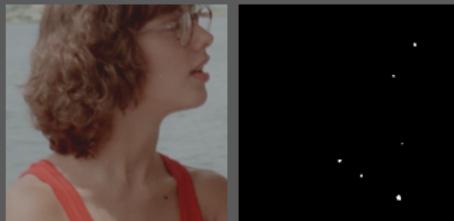
# Train - Ex6



(a) Input      (b) GT

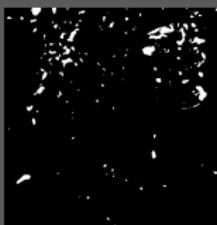


# Train - Ex7



(a) Input

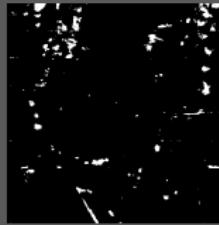
(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

(f) densenet

# Train - Ex8



(a) Input

(b) GT



(a) early



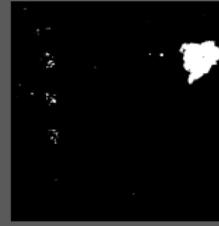
(b) late



(c) densenet



(d)



(e) densenet



(f) densenet

# Train - Ex9



(a) Input

(b) GT



(a) early



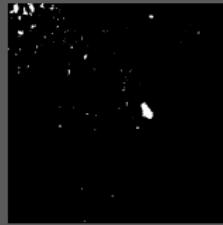
(b) late



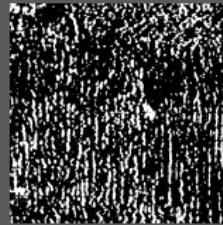
(c) densenet



(d)



(e) densenet



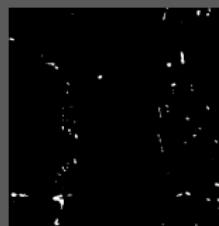
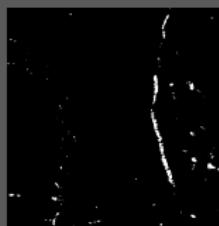
(f) densenet

# Train - Ex10



(a) Input

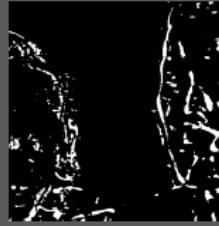
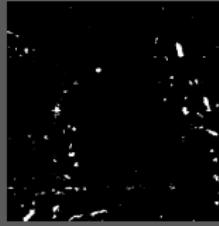
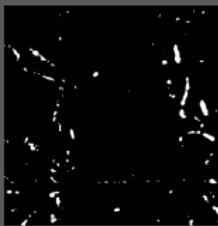
(b) GT



(a) early

(b) late

(c) densenet



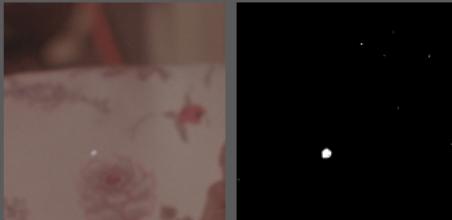
(d)

(e) densenet

(f)

densenet

# Ex1



(a) Input

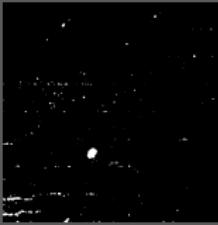
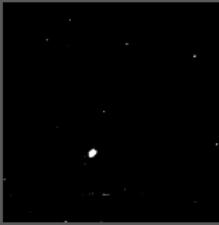
(b) GT



(a) early

(b) late

(c) densenet

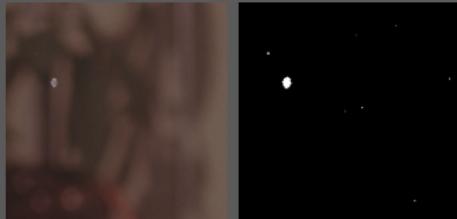


(d)

(e) densenet

(f) densenet

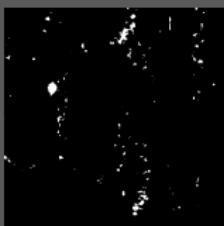
## Ex2



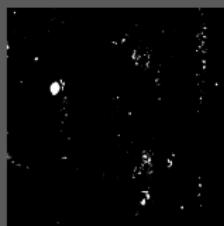
(a) Input



(b) GT



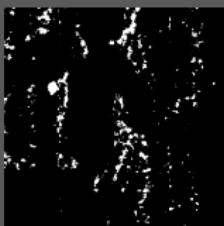
(a) early



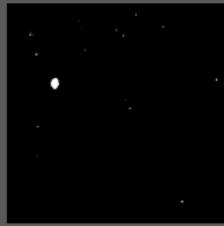
(b) late



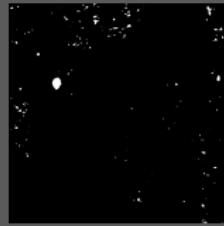
(c) densenet



(d)

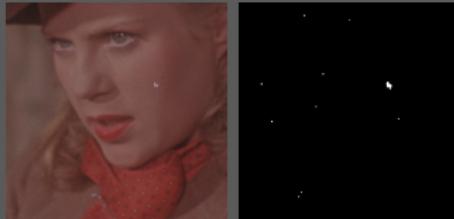


(e) densenet



(f) densenet

# Ex3



(a) Input

(b) GT



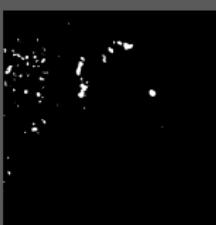
(a) early



(b) late



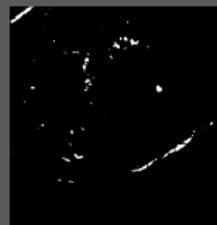
(c) densenet



(d)

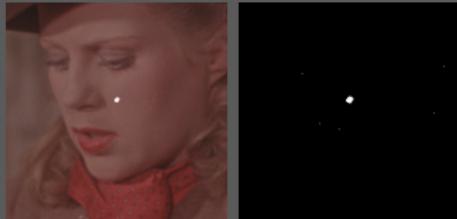


(e) densenet



(f) densenet

## Ex4



(a) Input

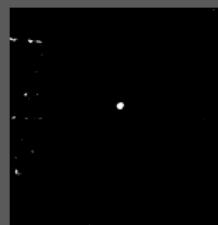
(b) GT



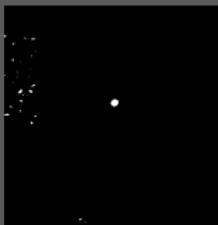
(a) early



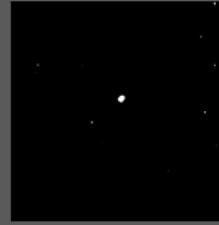
(b) late



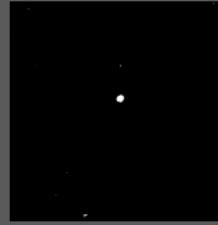
(c) densenet



(d)

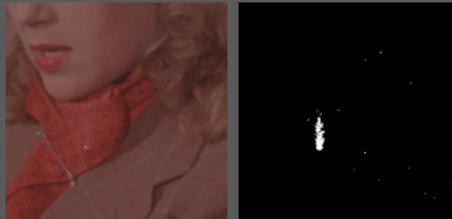


(e) densenet



(f) densenet

## Ex5



(a) Input

(b) GT



(a) early



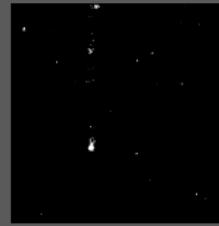
(b) late



(c) densenet



(d)

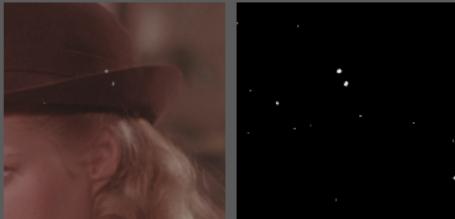


(e) densenet



(f) densenet

# Ex6



(a) Input

(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

(f) densenet

# Ex7



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

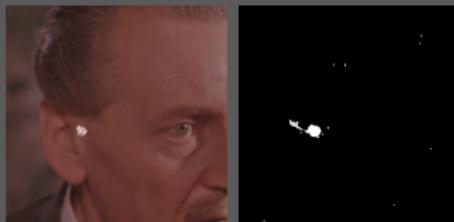


(d)

(e) densenet

(f) densenet

## Ex8



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

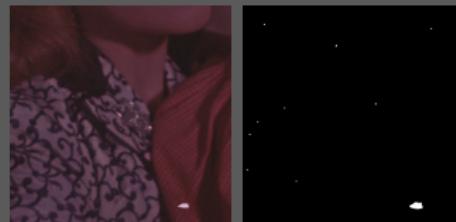


(d)

(e) densenet

(f) densenet

# Ex9

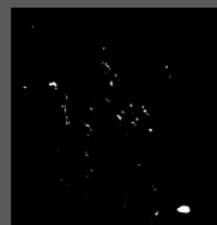


(a) Input

(b) GT



(a) early



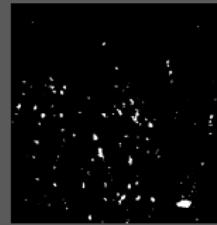
(b) late



(c) densenet



(d)

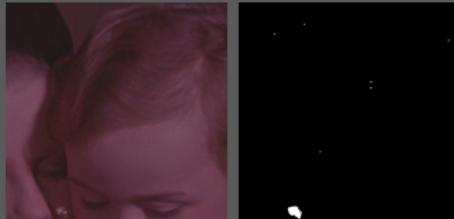


(e) densenet



(f) densenet

# Ex10

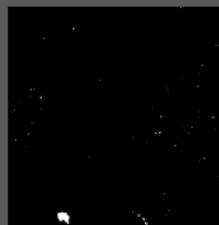


(a) Input

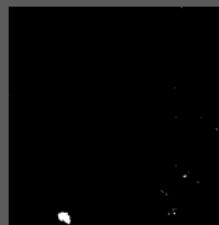
(b) GT



(a) early



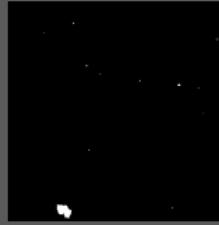
(b) late



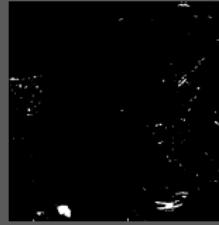
(c) densenet



(d)

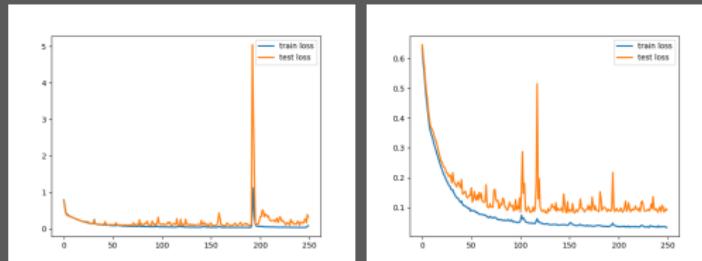


(e) densenet



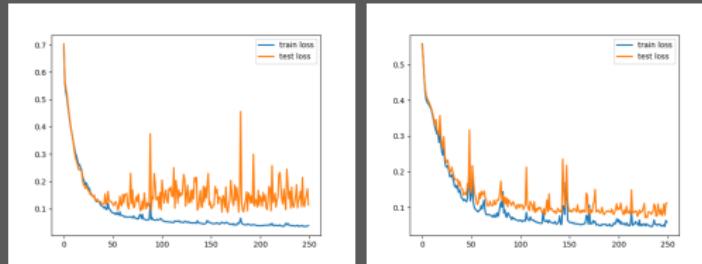
(f) densenet

# Trainingsloss



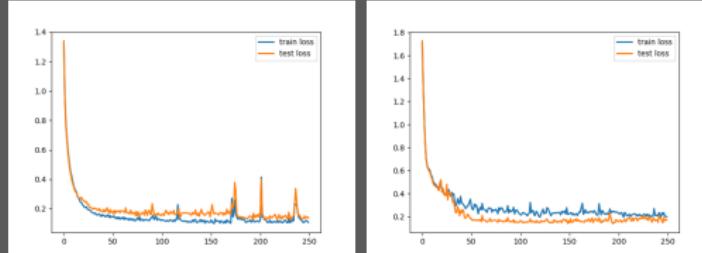
(a) early

(b) late

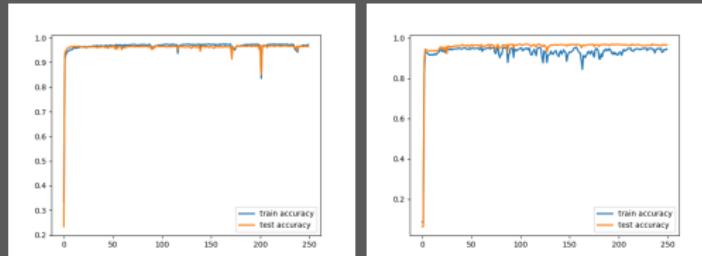
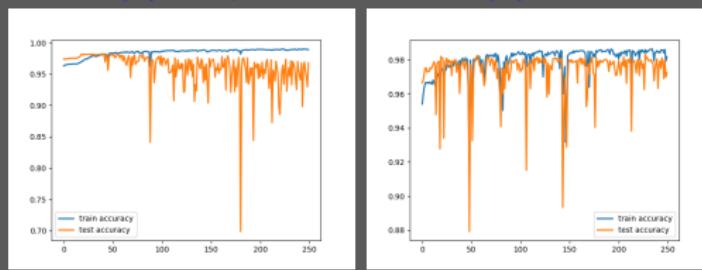
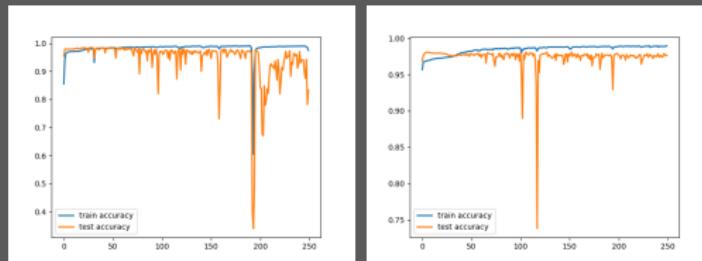


(c) densenet

(d) bottleneck

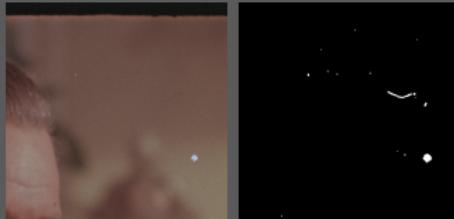


# Accuracy



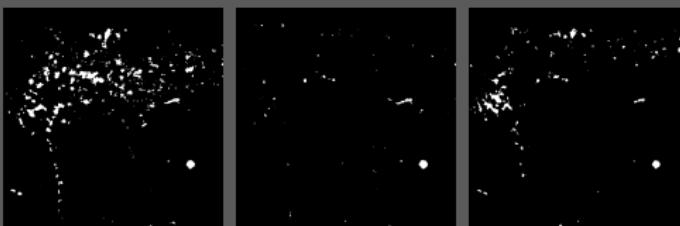


# Ex1



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

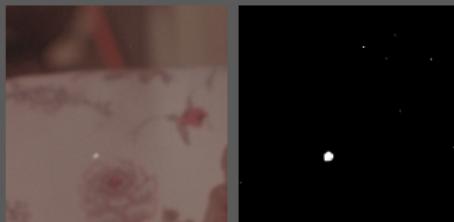


(d)

(e) densenet

(f) densenet

## Ex2



(a) Input

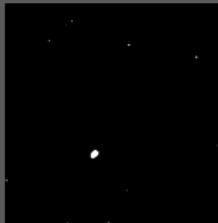
(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

(f) densenet

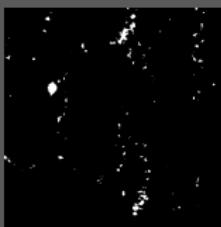
# Ex3



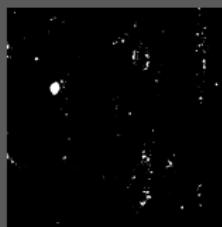
(a) Input



(b) GT



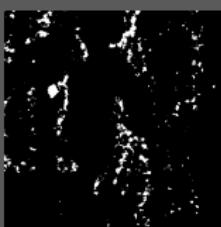
(a) early



(b) late



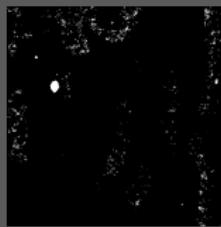
(c) densenet



(d)

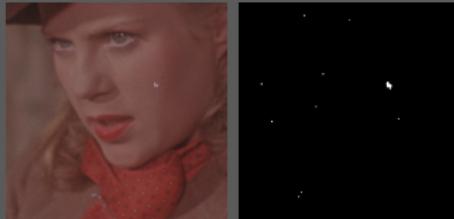


(e) densenet



(f)

## Ex4



(a) Input

(b) GT



(a) early



(b) late



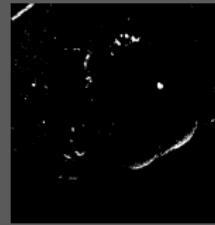
(c) densenet



(d)

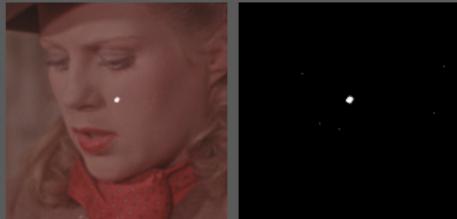


(e) densenet



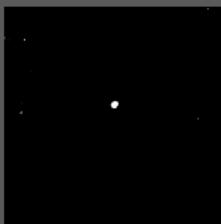
(f) densenet

## Ex5



(a) Input

(b) GT



(a) early



(b) late



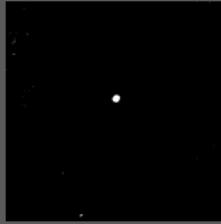
(c) densenet



(d)

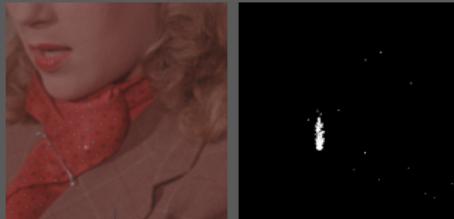


(e) densenet



(f) densenet

# Ex6



(a) Input

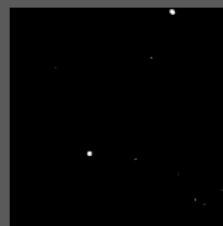
(b) GT



(a) early



(b) late



(c) densenet



(d)



(e) densenet



(f) densenet

# Ex7



(a) Input

(b) GT



(a) early



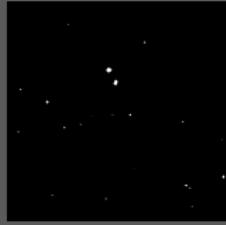
(b) late



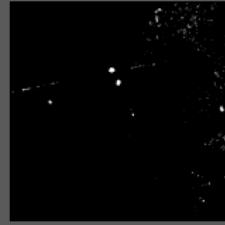
(c) densenet



(d)



(e) densenet



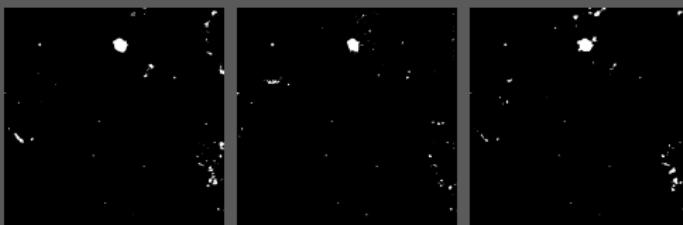
(f) densenet

## Ex8



(a) Input

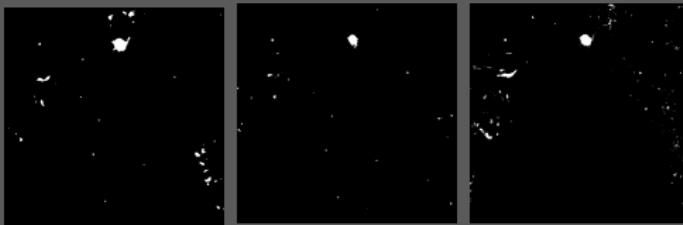
(b) GT



(a) early

(b) late

(c) densenet

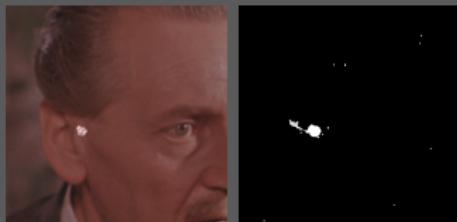


(d)

(e) densenet

(f) densenet

# Ex9



(a) Input

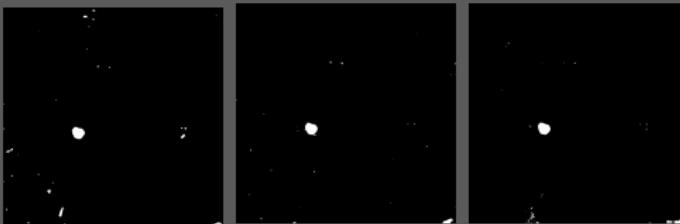
(b) GT



(a) early

(b) late

(c) densenet

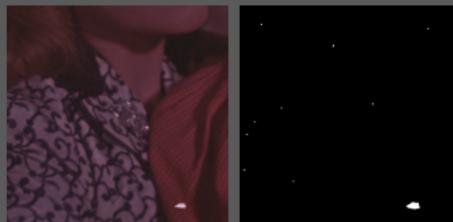


(d)

(e) densenet

(f) densenet

Ex10



(a) Input

(b) GT



(a) early



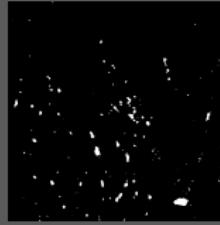
(b) late



(c) densenet



(d)

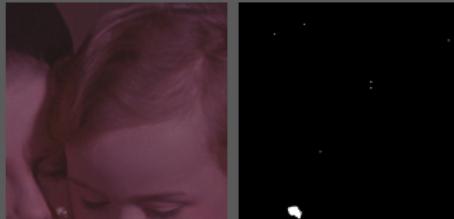


(e) densenet



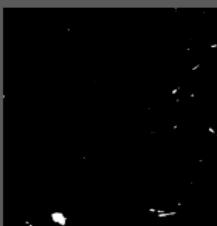
(f) densenet

# Ex11

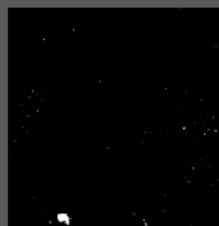


(a) Input

(b) GT



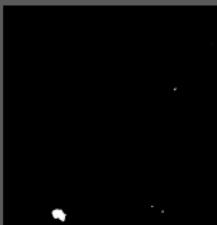
(a) early



(b) late



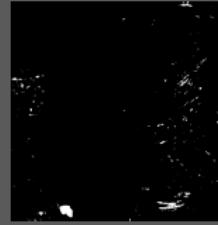
(c) densenet



(d)



(e) densenet



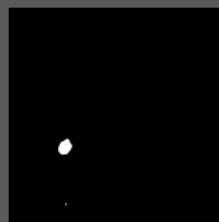
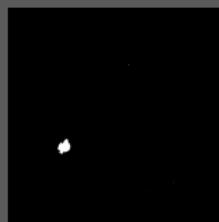
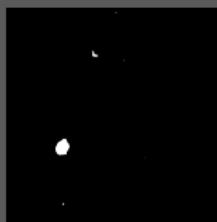
(f) densenet

## Ex12



(a) Input

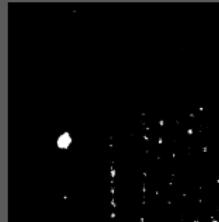
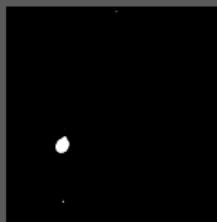
(b) GT



(a) early

(b) late

(c) densenet

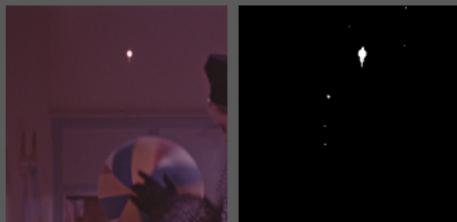


(d)

(e) densenet

(f) densenet

# Ex13



(a) Input

(b) GT



(a) early



(b) late



(c) densenet



(d)

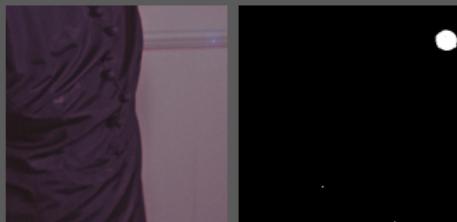


(e) densenet



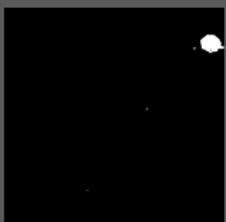
(f) densenet

## Ex14



(a) Input

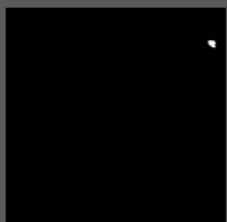
(b) GT



(a) early



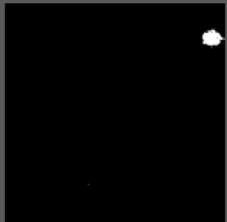
(b) late



(c) densenet



(d)

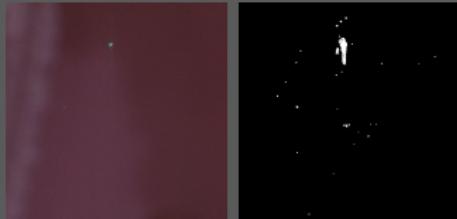


(e) densenet



(f) densenet

# Ex15



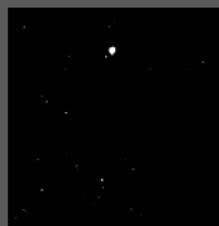
(a) Input



(b) GT



(a) early



(b) late



(c) densenet



(d)



(e) densenet



(f) densenet

eval\_reg\_in2/Early\_Stopping--Test\_Loss\_Comparision.png

eval\_reg\_in2/Early\_Stopping--Test\_Accuracy\_Comparision.pn

eval\_reg\_in2/Early\_Stopping--Large\_Area\_Loss\_Comparision.

eval\_reg\_in2/Early\_Stopping--Large\_Area\_Accuracy\_Comparis

eval\_reg\_in2/Early\_Stopping--Small\_Area\_Loss\_Comparision.

eval\_reg\_in2/Early\_Stopping--Small\_Area\_Accuracy\_Comparis

eval\_reg\_in2/Early\_Stopping--Large\_Flow\_Loss\_Comparision.

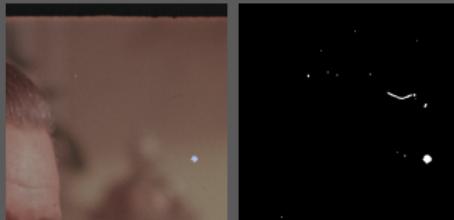
eval\_reg\_in2/Early\_Stopping--Large\_Flow\_Accuracy\_Comparis

eval\_reg\_in2/Early\_Stopping--Small\_Flow\_Loss\_Comparision.

eval\_reg\_in2/Early\_Stopping--Small\_Flow\_Accuracy\_Comparis

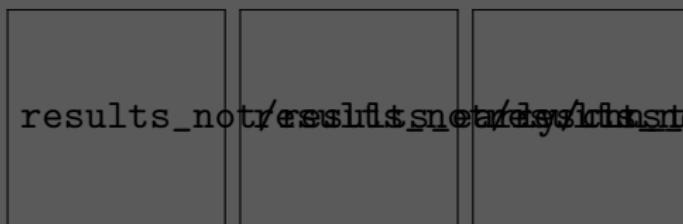


# Ex1



(a) Input

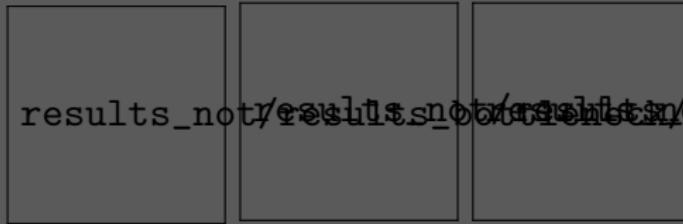
(b) GT



(a) early

(b) late

(c) densenet

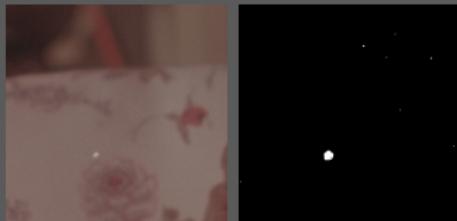


(d)

(e) densenet

(f) densenet

## Ex2



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

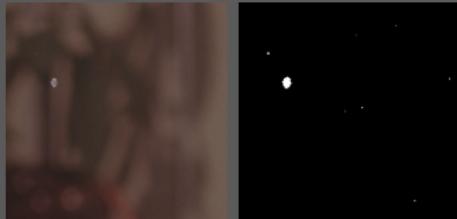


(d)

(e) densenet

(f) densenet

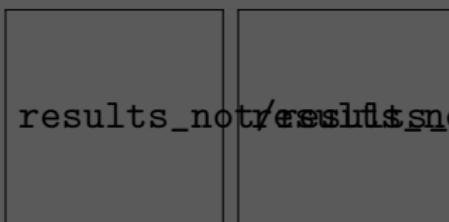
## Ex3



(a) Input



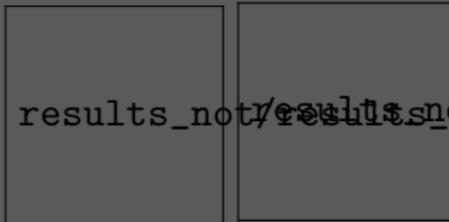
(b) GT



(a) early

(b) late

(c) densenet

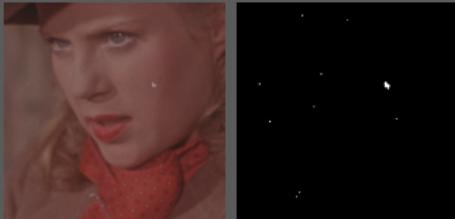


(d)

(e) densenet

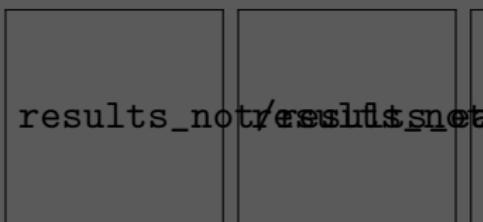
(f) densenet

## Ex4



(a) Input

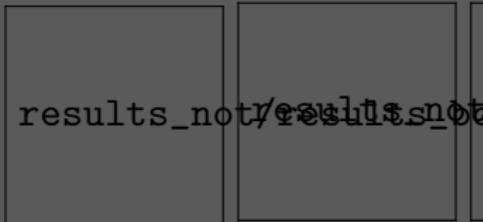
(b) GT



(a) early

(b) late

(c) densenet

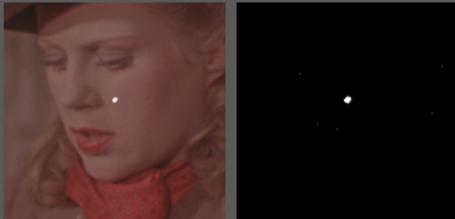


(d)

(e) densenet

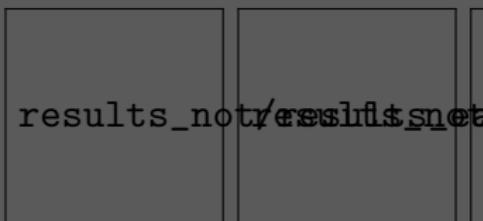
(f) densenet

## Ex5



(a) Input

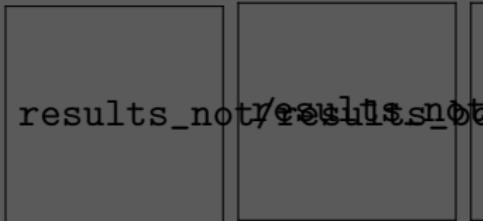
(b) GT



(a) early

(b) late

(c) densenet

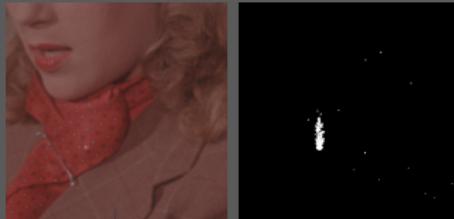


(d)

(e) densenet

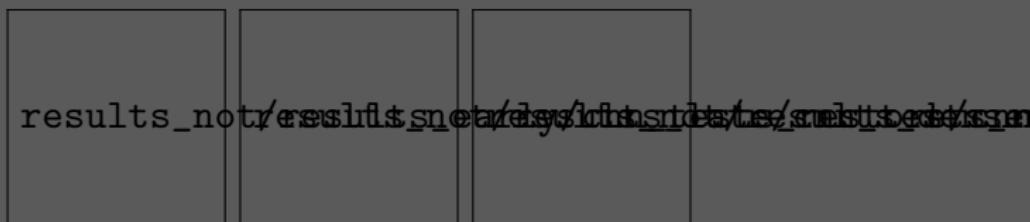
(f) densenet

## Ex6



(a) Input

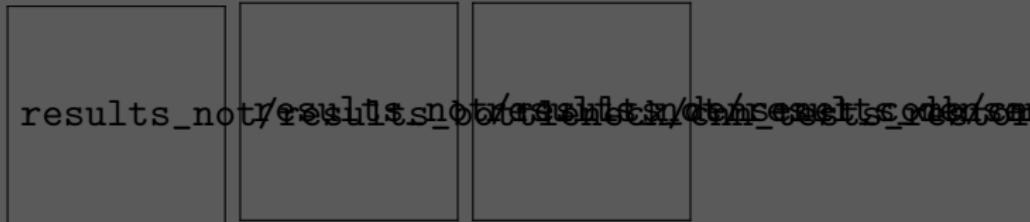
(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

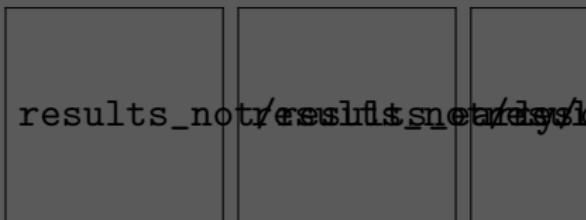
(f) densenet

## Ex7



(a) Input

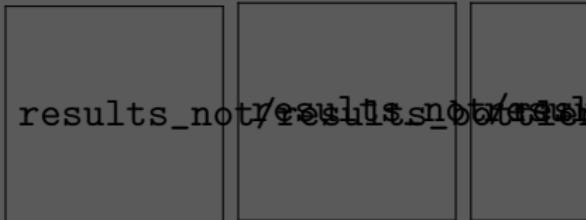
(b) GT



(a) early

(b) late

(c) densenet



(d)

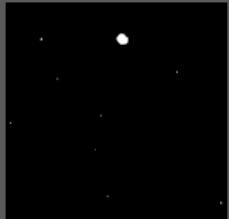
(e) densenet

(f) densenet

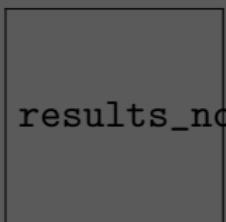
## Ex8



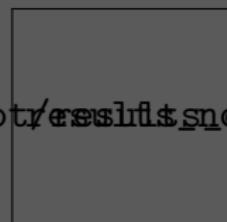
(a) Input



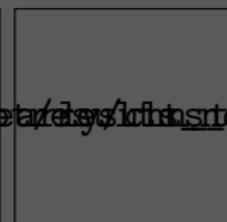
(b) GT



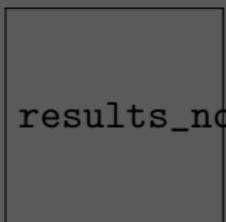
(a) early



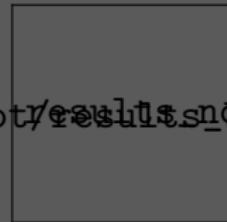
(b) late



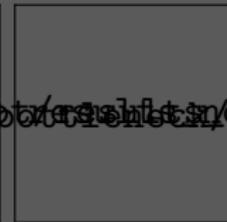
(c) densenet



(d)



(e) densenet

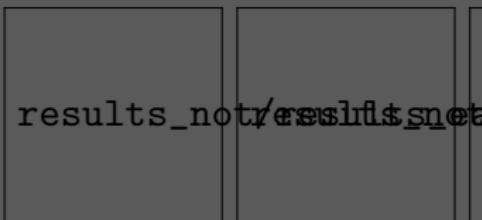


(f) densenet



(a) Input

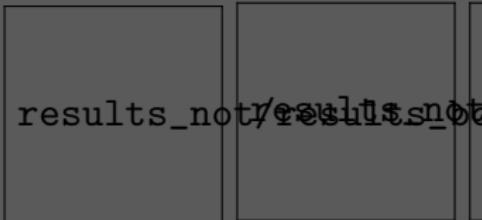
(b) GT



(a) early

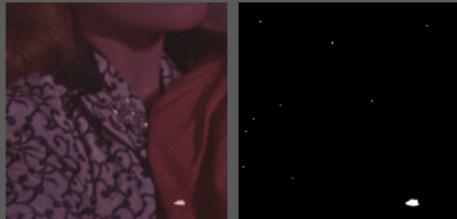
(b) late

(c) densenet



(e) densenet

## Ex10



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

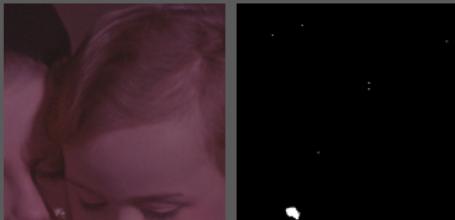


(d)

(e) densenet

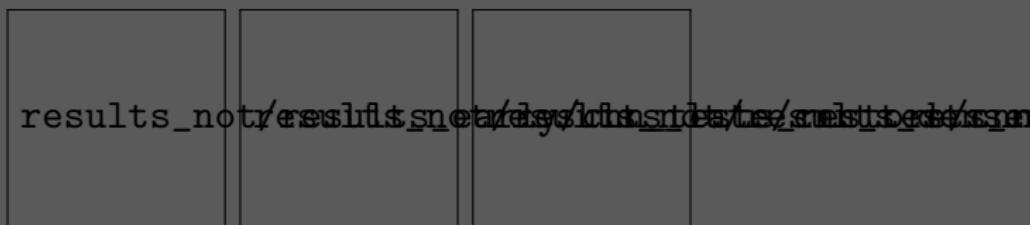
(f) densenet

# Ex11



(a) Input

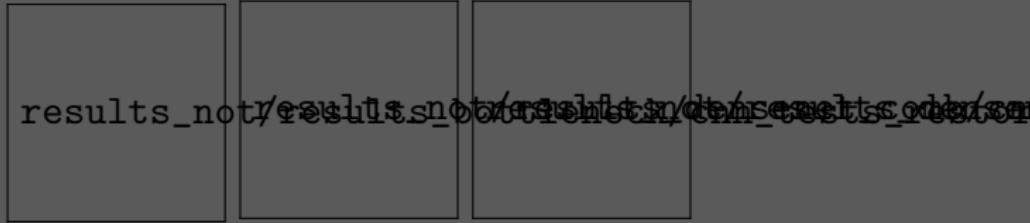
(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

(f)

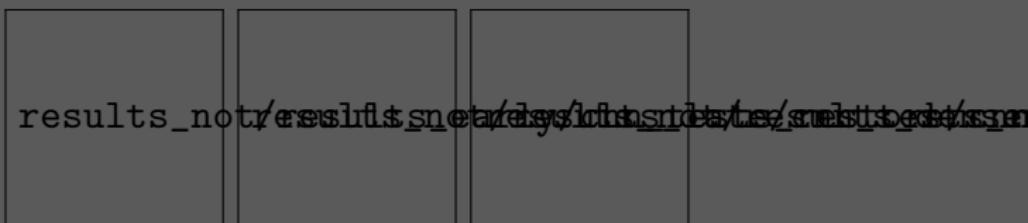
densenet

## Ex12



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

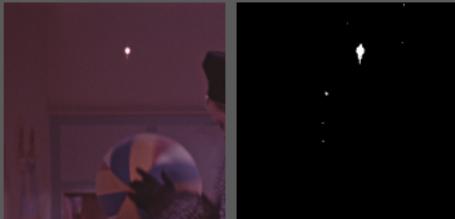


(d)

(e) densenet

(f) densenet

# Ex13



(a) Input

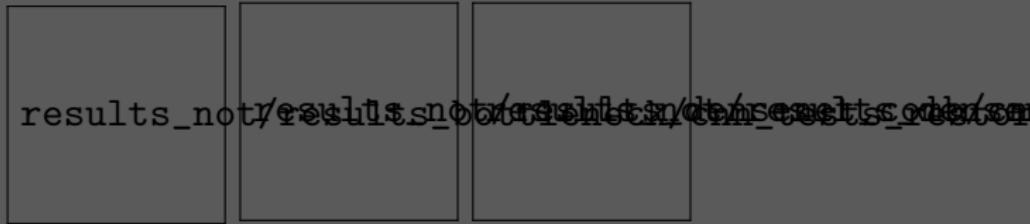
(b) GT



(a) early

(b) late

(c) densenet

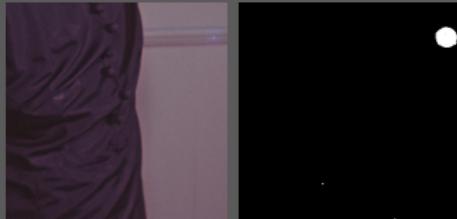


(d)

(e) densenet

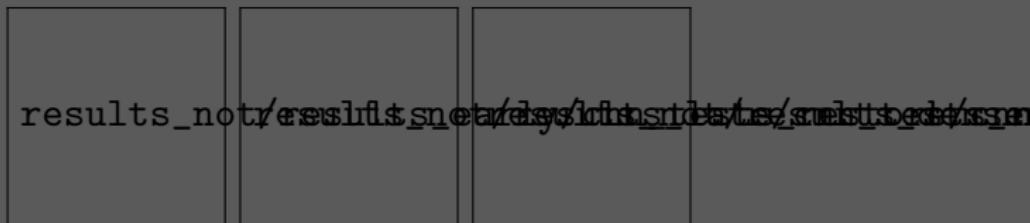
(f) densenet

## Ex14



(a) Input

(b) GT



(a) early

(b) late

(c) densenet

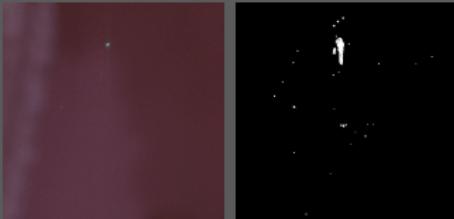


(d)

(e) densenet

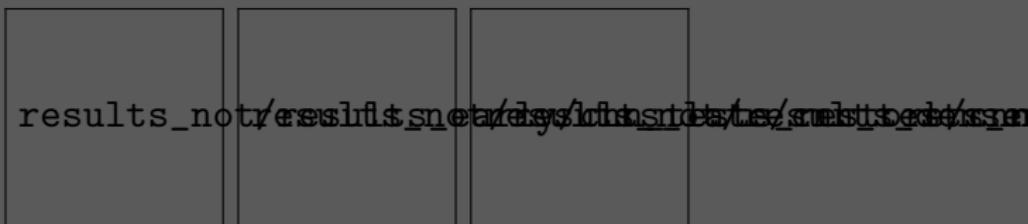
(f) densenet

## Ex15



(a) Input

(b) GT



(a) early

(b) late

(c) densenet



(d)

(e) densenet

(f) densenet