NPTEL ONLINE CERTIFICATION COURSES

Course Name: Deep Learning

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Department : E & ECE, IIT Kharagpur

Topic

Lecture 55: Network Training for Semantic Segmentation

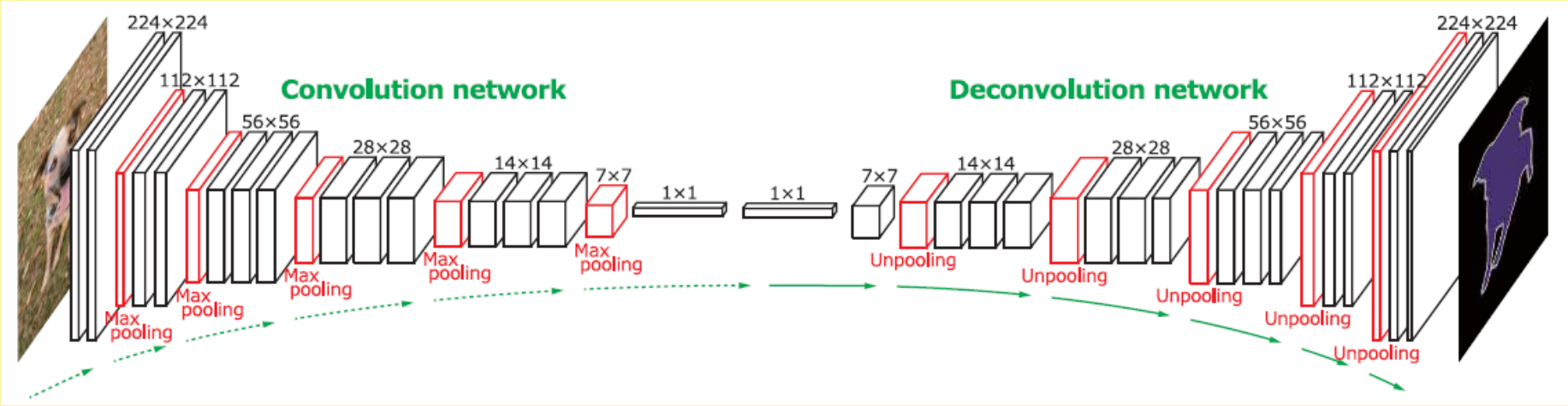
CONCEPTS COVERED

Concepts Covered:

- ❑ Semantic Segmentation
- ❑ Fully Convolutional Network
- ❑ Deconvolutional Network
- ❑ Network Training
- ❑ Cross Entropy Loss
- ❑ Dice Loss

Network Training
for
Semantic Segmentation

Deconvolution Network



Hyeonwoo Noh, Seunghoon Hong, Bohyung Han, "Learning Deconvolution Network for Semantic Segmentation", ICCV 2015

Fully Convolutional Network

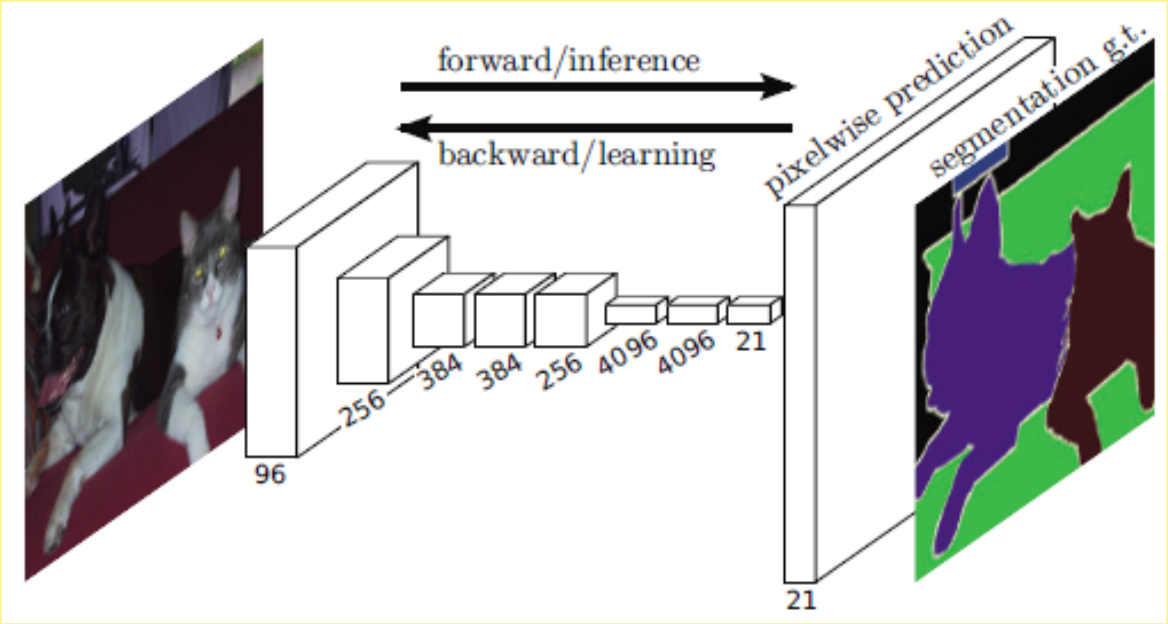
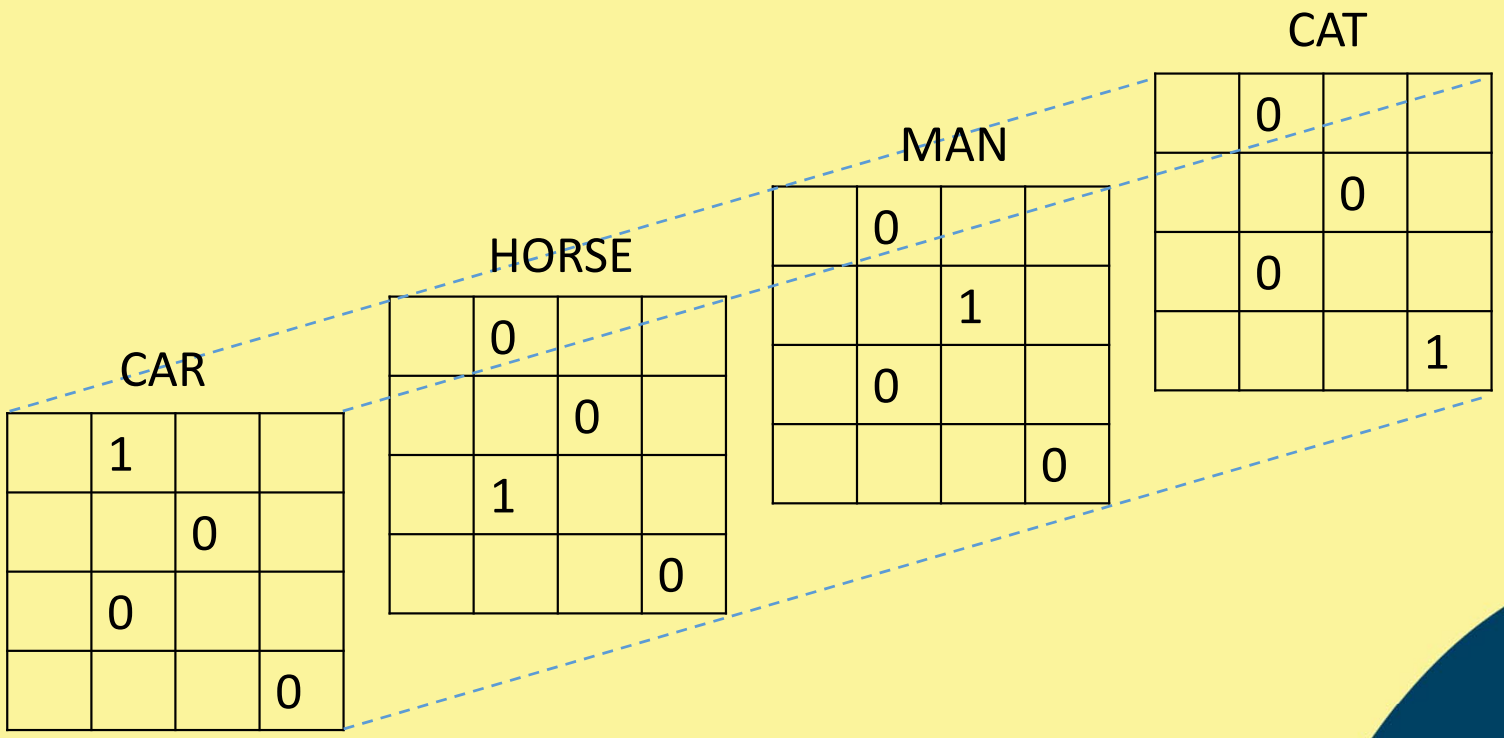


Image Source: Jonathan Long, Evan Shelhamer, Trevor Darrell, “Fully Convolutional Networks for Semantic Segmentation”, CVPR 2015

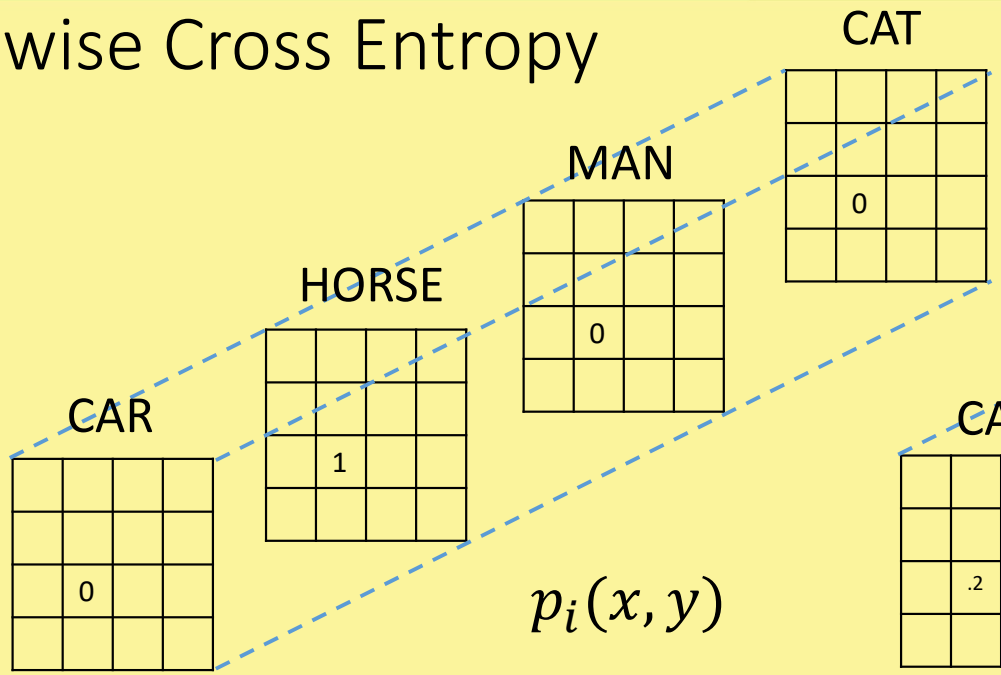
Training Ground Truth

Image Source: Jonathan Long, Evan Shelhamer, Trevor Darrell, “Fully Convolutional Networks for Semantic Segmentation”, CVPR 2015

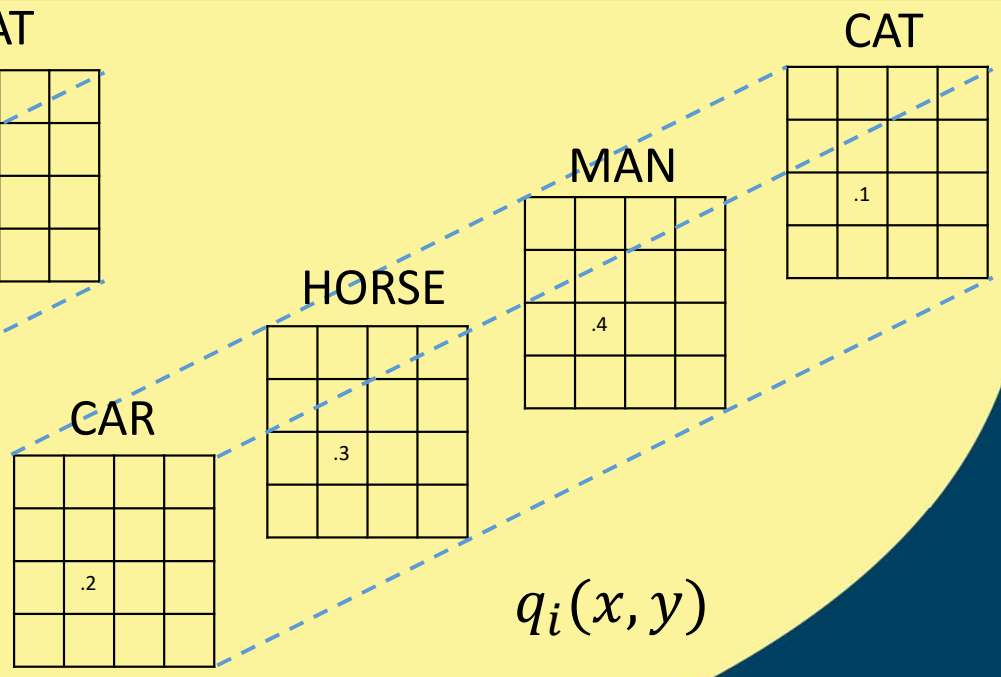
Training for Sem Segmentation



Pixel wise Cross Entropy



$p_i(x, y)$



$q_i(x, y)$

$$L = -\frac{1}{N}\sum_{N}\sum_{x,y} p_i(x, y).\, log q_i(x, y)$$

Semantic Segmentation

CAR (1)

0.2				
		.05		

HORSE(3)

0.1				
		0.6		

2				
		3		

SEGMENTATION

MAN (2)

0.5				
		.25		

CAT (4)

0.1				
		0.1		

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Thank you