CW

Friday, 8 November 2019 11:30

4 layer CNN

Input 41x85 (3400) — 0 p

1) 32 kernels 41x85
3x3 receptive field — 288 p
2x2 stride
ReLU
Batch-Normalization

2) 32 kernels 41x85
3x3 receptive field — 9.2K p
2x2 stride — 0.5 dropout
Batch-Normalization
ReLU
max-pooling

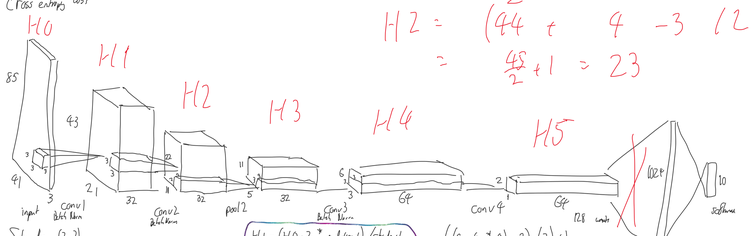
3) 64 kernels 21x43
3x3 receptive field — 18.4 K p
2x2 stride
Batch Norm
ReLU

4) 64 kernels 21x43 (903)
3x3 receptive
2x2 stride — 36.8 kP
Batch-Norm — 0.5 dropout
ReLU

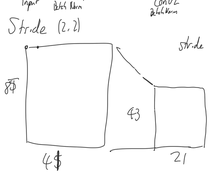
5) FCL 1024 — 15.9 M p
1024
sigmoid

6) output of 10 items — 10.2 K p

Batch - 32
L_2 regularization
LR 0.001
Momentum 0.9
Cross entropy loss



Stride (2,2)



stride 2

H1 = (H0 + 2 * pad-based) / stride + 1
W1 = (W0 + 2 * pad-based) / stride + 1

H1 = ((22 + (2 * 0) - 2) / 2) + 1
= 11
W1 = ((11 + (2 * 0) - 2) / 2) + 1
= $\frac{9}{2}$ + 1
= 5 By JA transition correct

((6 + (2 * 0) - 3) / 2) + 1
= $\frac{3}{2}$ + 1 = 2
((3 + (2 * 0) - 3) / 2) + 1
= $\frac{0}{2}$ + 1 = 1

$\frac{1024}{64}$ = 16

16 = 1, 16
2, 8
4, 4

H1 = ((85 + (2 * 0) - 3) / 2) + 1
= $\frac{82}{2}$ = 42 + 1 = 43

Assumption 2x2 padding with stride 2x2

H1 = ((85 + (2*2) - 3)/2) + 1
= $\frac{86}{2}$ + 1 = 44
H2 = (44 + 4 - 3 / 2) + 1
= $\frac{45}{2}$ + 1 = 23

H3 = ((23 + (0*2) - 2)/2) + 1
= 11
H4 = ((11 + (2*2) - 3)/2) + 1
= 7
H5 = ((7 + (2*2) - 3)/2) + 1
= 5

W1 = (41 + (2*2) - 3)/2 + 1
= 22
W2 = 22 + 4 - 3 / 2 + 1
12
W3 = 12 + 4 - 3 / 2 + 1
= 7

W4 = 7 + 0 - 2 / 2 + 1
= 3
W5 = 3 + 4 - 3 / 2 + 1
= 3

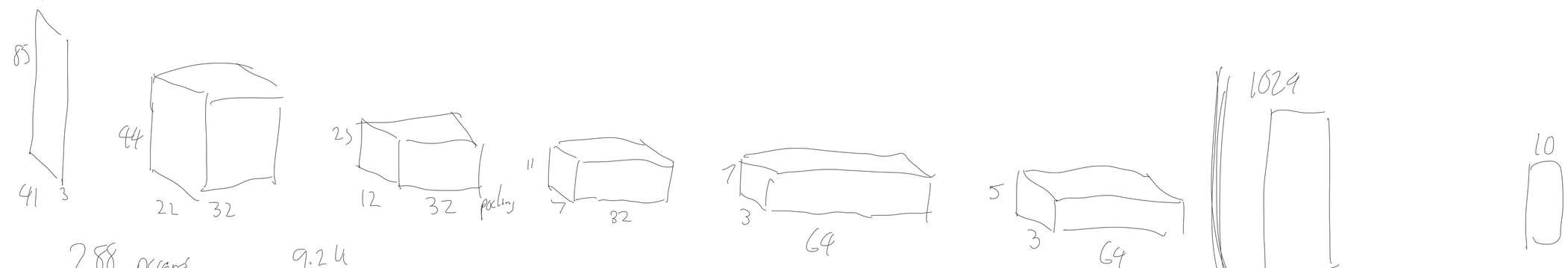
2x2 padding yields

yields a 960 linear

Option 1 :

Option 2 : same padding

Params



288 params — 9.2 K — 64x32x9 — 64x64x9 — 15.9 M — 10.2

32 x 9 — 32x32x9 — 18432 — 36864 — 1024x10 = 10240

Correct — 9216

Padding

3485 — 111.5 K — 111.5 — 57.8 K — $\frac{36.8}{64}$ = 575

i.e byte per item — = 85x41x32 — = 85x41x32 — 44x22 x64 = 61952 — 43x21x64 = 57792 — 43x21x64 = 57792

Either memory values inconsistent and calculated without stride

OR shape inconsistent

assume pool

H6 = (43 + (2*0) - 2) / 2 + 1
21
W6 = (21 + 2*0 - 2) / 2 + 1
10

21 x 10 x 64 = 13440

H7 = (21 + (2*0) - 2) / 2 + 1
10
W7 = (10 - 2 / 2 + 1
= 5

2 pools too long
10*5*64 = 3200

H8 = 5
W8 = 2

3 pools too long