THURSDAY
FEB '18
15
046-319 WK-07

VGG-16 | CNN model.

~~ImageNet Large~~

The model processes input image and outputs the vector of 1000 values (no. of classes).

$$\hat{y} = \begin{bmatrix} \hat{y}_0 \\ \hat{y}_1 \\ \vdots \\ \hat{y}_{998} \\ \hat{y}_{999} \end{bmatrix}$$

The vector presents the classification probability for the corresponding classes. Suppose we have a model that predicts image belongs to class 0 with probability 0.05, class 2 with probability 0.05, class 3 with probability 0.03 and so on. so, classification vector for this will be

$$\hat{y} = \begin{bmatrix} \hat{y}_0 = 0.05 \\ \hat{y}_1 = 0.08 \\ \hat{y}_2 = 0.05 \\ \hat{y}_3 = 0.03 \\ \vdots \end{bmatrix}$$

February 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28											

To give money in charity is good, but to be a pure and a charitable soul is far greater.

To make sure these probabilities add to 1, we use softmax function defined as

$$P(y = j \mid \theta^{(i)}) = \frac{e^{\theta^{(i)}}}{\sum_{j=0}^{K} e^{\theta^{(K)}}}^{i}$$

where $\theta = w_0 x_0 + w_1 x_1 \cdots w_K x_K = \sum_{i=0}^{K} w_i x_i$

and after that we take 5 most probable candidate in a vector

$$C = \begin{bmatrix} 780 \\ 0 \\ 1 \\ 2 \\ 999 \end{bmatrix}$$

and our ground truth vector is defined as follows.

$$G = \begin{bmatrix} G_0 \\ G_1 \\ G_2 \end{bmatrix} = \begin{bmatrix} 780 \\ 2 \\ 999 \end{bmatrix}$$

Then we define our error function as follows

$$E = \frac{1}{n} \sum_{-K} \min_i d(C_i, G_K)$$

SATURDAY
FEB '18
17
048-317 WK-07

where $d = 0$ if $c_i = G_k$ else $d = 1$

So the loss function for this example is

$$E = \frac{1}{3}(\min_i d(c_i, G_1) + \min_i d(c_i, G_2) + \min_i d(c_i, G_3))$$

So

$$E = \frac{1}{3}(0 + 0 + 0) = 0.$$

Since, all the categories in ground table are in predicted top 5 matrix so the loss becomes 0.

Architecture

The input to the network is Image of dimensions (224, 224, 3). The first two layers have 64 channels of 3*3 filter size and same padding. Then after a max pool layer of stride (2,2), two layers which have convolution layers of 256 filter size and filter size (3,3). This followed by a max pooling layer of stride (2,2) which is same as previous layer.

February 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28											

17-02

Sometimes in life we wear so many masks that it becomes difficult to see our true self.

SUNDAY
FEB '18
18
049-316 WK-07

Then there are 2 convolution layers of filter size (3,3). This followed by a max pooling layer of stride (2,2) which is same as previous layer. Then there are 2 convolution layers of filter size (3X3) and 256 filter. After that there are 2 sets of 3 convolution layer and a max pool layer. Each have 512 filters of (3,3) size with same padding. This Image is then passed to the stack of two convolution layers. In these convolution and max pooling layers, the filter we use is of size 3*3, instead of 11*11 in Alexnet. There is padding of 1-pixel (same padding) done after each convolution layer to prevent spatial feature of the Image. After the stack of convolution and max pooling layers, we get a (7,7,512) feature map. We flatten this output to make it a (1, 25088) feature vector. After this there are 3 fully connected ~~layer to make it a (1,~~ 1st layer takes the input from last feature vector and outputs a (1, 4096) vector, second layer also outputs a vector of size (1, 4096) but the third layer outputs a 1000 channels for 1000 classes

March 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31								

Real power and authority is not power and authority over others, but over the self.

18-02

MONDAY

FEB '18

19

050-315 WK-08

then after output of 3rd ~~layer~~ fully connected layer it passed to softmax layer in order to normalize the classification vector

February 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28											

Someone's sitting in the shade today because someone planted a tree a long time ago.

19-02