North South University

Department of Electrical and Computer Engineering

CSE465: Pattern Recognition and Neural Network

Spring 2021

Total Marks: 25

Due: 23rd April 2021, 11:59pm

Consider the following neural network:

Layer #	Layer Type	Details	Activation function
1	Input	CMYK Image, 128x128 resolution. All pixel values are real numbers scaled between 0-1	None
2	Convolutional	30, 3x3 filters. Stride =1	RelU
3	Convolutional	12, 5x5 filters. Stride = 1	RelU
4	Max Pooling	2x2, Stride = 1	Not Applicable
5	Custom Layer – Channel Normalization	The mean and standard deviation is calculated for each incoming channel. The output is a tensor where each channel is separately normalized (z-scores).	Not Applicable
6	Flattening Layer		
7	Fully Connected	157 neurons	Softmax

Task 1: (5 marks)

Calculate the number of trainable parameters of the network.

Task 2: (10 marks)

You have to convert this to a fully convolutional network. So, both layer 6 and 7 will be replaced with a single convolutional layer. Configure this newlayer so that we still obtain a Probability Distribution over 157 classes.

How many trainable parameters in this new network?

Task 3: (10 marks)

How can you reduce the number of trainable parameters while still keeping it a fully convolutional network?