CSE 425 Final Fall 2020

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Answer

Answer any 2 out of 4 Questions
You must answer the T/F Questions

In CNN Pooling layers do not have parameters, they do not affect the backpropagation

- ◯ True
- ◯ False

Some conflicts among training exemplars in a BPN can be resolved by adding features to the input vectors and adding input layer neurons to the network.

- ◯ True
- ◯ False

Un-Supervised learning can be done using CNN

- ◯ True
- ◯ False

Can it be said flattening is transforming images to vectors to make it easier to predict.

- ◯ True
- ◯ False

Feature Learning has Convolution, ReLU and Pooling components, with numerous iterations between them before move to Classification, which uses the Flattening and Full Connection components. So there is two major steps in CNN that can be said as Feature Learning and another is Classification

- ◯ True
- ◯ False

Question 1

If you have a 128*128 binary image at input in a CNN network with 6 filters(size of 5*5) stride of 2 and no padding of 0 and apply 4 sets of Conv and max pool(size of 2*2) what will be the number of nodes in the flattening layer? Show each steps after conv and max pool layers happen.

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Question 2

You have a pet dog whose mood is heavily dependent on the current and past few days' weather. You've collected data for the past 365 days on the weather, which you represent as a sequence as x<1>,...,x<365>. You've also collected data on your dog's mood, which you represent as y<1>,...,y<365>. You'd like to build a model to map from x→y. What neural network model you wanna use to solve this problem?State reasons of your choosing.

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Question 3

What is update gate and reset gate of GRU(Gated Recurrent Unit)? What is the difference of the work flow of LSTM and GRU? Show your reasons why GRU is faster in compare to RNN??

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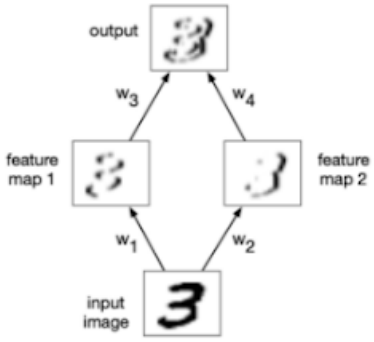
Question 4

Explain the shared concept of CNN? You will design a convolutional network to detect vertical boundaries in an image. The architecture of the network is as shown below.



The ReLU activation function is applied to the first convolution layer. The output layer uses the linear activation function. Design **two convolution filters** for the first layer, of size 3 x 3. One of them should detect black/white boundaries, and the other should detect white/black boundaries.

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