

CS 677 Deep Learning final exam review sheet

1. Neural networks
 - a. Single layer neural networks
 - b. Output of a test data point via a neural network
2. Convolutional neural networks (CNN)
 - a. Convolution kernel
 - b. Shared vs. layer-wise weights
 - c. Pooling kernel: Max and average
 - d. Flattening
 - e. Determining output dimensions after successive layers
 - f. Output of a test datapoint via a CNN
3. Transposed convolutions (Deconvolutions)
 - a. Deconvolution of size 2x2 and stride 1 from 2x2 to 3x3 image
 - b. Deconvolution of size 2x2 and stride 2 from 2x2 to 4x4 image
 - c. U-Networks
4. Optimization of neural networks
 - a. Objective for a single layer neural network with loss functions
 - i. Least squares
 - ii. Cross-entropy
 - b. Stochastic gradient descent
 - c. Objective for a simple convolutional neural network
 - d. Adaptive learning rates:
 - i. Momentum
 - ii. Gradient weights
5. Gradient updates
 - a. Single layer network
 - b. Simple convolutional network
 - c. Updates for networks given in course notes
6. Multiple choice:
 - a. Self-supervised learning
 - b. Adversarial attacks
 - c. Data augmentation
 - d. Batch normalization
 - e. Automatic network generation
7. GPU programming with CUDA
 - a. Memory architecture
 - b. Coalescent access vs. non-coalescent
 - c. Parallelizing dot products with CUDA