University of Rajshahi

Department of Computer Science and Engineering

Artificial Intelligence Lab [CSE-4132]

| 1. | Build a fully connected neural network (FCNN) and a convolutional neural network (CNN) for classifying 10 classes of images. | 5 |
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| 2. | Train and test your FCNN and CNN by the Fashion dataset. Discuss your results by comparing performance between two types of networks. | 5 |
| 3. | Build a CNN having a pre-trained MobileNet as backbone to classify 10 classes. | 5 |
| 4. | Train and test your CNN having a pre-trained MobileNet as backbone to classify images of the CIFAR-10 dataset. Discuss your results by comparing performance between transfer\_learning + fine tuning and only transfer learning. | 5 |
| 5. | Prepare a neural network with appropriate activation functions, so that it has the same architecture as shown in the following Figure-1. | 5 |
| Figure-1 | | |
| 6. | Prepare a neural network with appropriate activation functions, so that it has the same architecture as shown in the following Figure-2. | 5 |
| Figure-2 | | |

| 7. | Train networks shown in Figure-1 to classify images of two classes captured by your mobile phone with the following conditions:  ● 1st 10 epochs full network will be trained  ● Next 10 epochs, neurons of 1st and 2nd hidden layers will be  freezed ● batch\_size = 8  ● Training\_set = 70% of total data, validation\_set = 20% of training set, test set = 30% of total data  ● After every epoch, the model will be saved if the validation loss is lower than previous all epochs. | 5 |
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