2023 Spring Introduction to Deep Learning

Chapter 1: Introduction Bonus

1. What is machine learning?

Machine learning is a field of artificial intelligence that enables computer systems to automatically improve their performance on a particular task by learning from data.

1. What is the difference between machine and deep learning?
   1. Architecture: Machine learning algorithms typically use a linear model, where the input features are transformed into a set of weights that are used to make predictions. In contrast, deep learning algorithms use neural networks, which are composed of many interconnected layers of artificial neurons.
   2. Data requirements: Deep learning algorithms require a large amount of data to train effectively, while machine learning algorithms can often be trained with smaller datasets.
   3. Interpretability: Machine learning models are often more interpretable than deep learning models. That is, it is easier to understand how the model is making predictions, and to trace the reasoning behind those predictions. Deep learning models, on the other hand, are often seen as "black boxes" that are difficult to interpret, because of the large number of parameters and the complexity of the models.
2. Can CNN and RNN be combined into one neural network architecture? If yes, for what kind of applications?

Yes, Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) can be combined into a single neural network architecture. This type of architecture is known as a Convolutional Recurrent Neural Network (CRNN). CRNNs are often used for tasks that involve sequential data, such as speech recognition, video analysis, and natural language processing.

