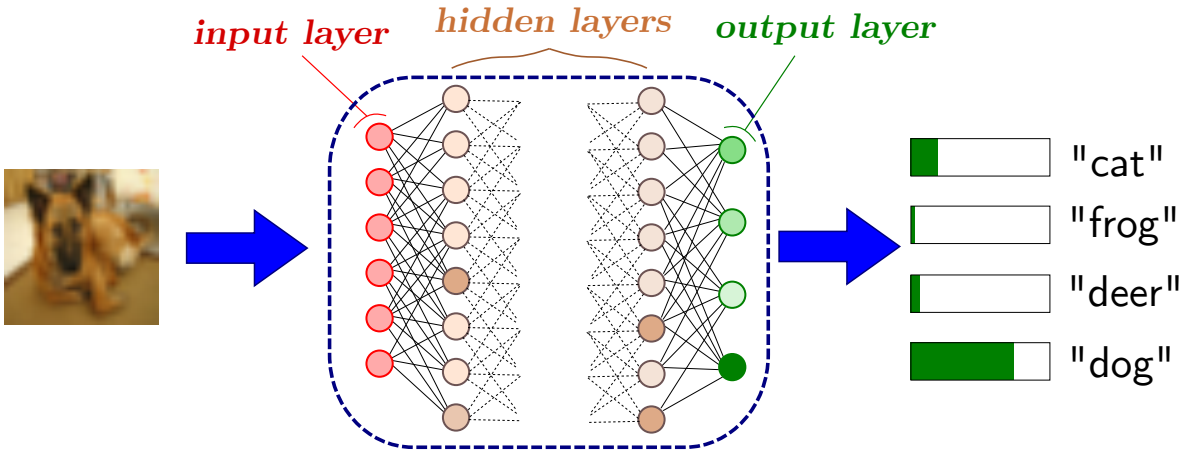
APM 598: **Introduction to deep neural networks**



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Textbook:

- A. Géron, *"Hands-On Machine Learning with Scikit-Learn and TensorFlow"*
- (supplementary) I. Goodfellow, Y. Bengio, A. Courville, *"Deep Learning"*

Course Description

The goal of this course is to give a practical understanding of deep neural networks. We will use classification problems to illustrate and test different network architectures. After a brief introduction about machine learning, we first present how to train simple neural networks (fully connected) using stochastic gradient descent and backpropagation. Then, we focus on convolutional neural networks (CNN) for image classification. Finally, we will study recurrent neural networks for sentiment analysis. It time allows, we will also discuss auto-encoder.

Most of the examples and codes will be written in Python and deep neural networks will be implemented using Pytorch. However, students are welcome to use other frameworks such as TensorFlow.

The course is divided in three parts:

1) Brief review about machine learning and first training of a two-layer neural networks.
2) **Convolutional Neural Networks** (CNN) for image classification.
3) **Recurrent Neural Networks** (RNN) for sentiment analysis.

Grading

Homework	biweekly	50%
Project	1	50%