Teach yourself Machine Learning the hard way ! (Part 2)

August 19, 2014 Uncategorized machine learning, online courses

This post will provide with the resources that will help you graduate to next level in machine learning.

For starters, you need to take a course which approaches machine learning bit more formally than Prof. Andrew Ng's course.

1. More formal Machine Learning class
Prof. Abu-Mostafa teaches learning theory and kernel machines really well. You can also do the assignments using any language.

- Learning from Data

2. A course on optimization

By now, you must have noticed that every Machine Learning algorithm invariably uses optimization of a objective function. Having optimization in your toolbox makes you very valuable as a Machine Learning practitioner. A introductory course in Convex Optimization will get you familiar with optimization vocabulary and enough math, so that you can learn more things in optimization by yourself.

- Convex Optimization

3. Learn Probabilistic Graphical Models

If you plan to work in Computer Vision or Natural Language Processing, you will invariably come across one or the other kind of a graphical model. Learning different inference techniques and learning principles will be handy when you are trying to understand a new graphical model. Algorithms course that you studied earlier comes in very handy for this course.

- Probabilistic Graphical Models

Sampling based inference, specifically MCMC (Markov Chain Monte Carlo) could be quite puzzling to understand at first.

- Beginners introduction to MCMC. (Watch just Lecture 1). Foundations of many Probabilistic Graphical Models actually comes from Statistical Mechanics. It's a really good introduction to the topic, in a intuitive way.
- More formal introduction to MCMC.
- MCMC for Machine Learning. If you prefer written treatise of the same topic.

4. Deep Learning

If you are fascinated by larger goal of AI, you may find Deep Learning interesting. Deep learning approaches hold many records on many data-sets that researchers care about. Prof. Jeff Hinton, one of the authorities on the topic has an excellent course.

- Neural Network for Machine Learning It has very good videos on historical parts of Deep Learning.
- Neural Network Class by Prof. Hugo Larochelle, the course page also contains references to recent research in Deep Learning.

Stanford has 2 excellent courses on Applied Deep Learning in the following areas:

- Convolutional Neural Networks for Visual Recognition covers Convolution Networks for object detection in great detail and recent developments in Deep Learning for Vision.
- Deep Learning for Natural Language Processing covers Word Vector Representations, Recurrent Neural Networks, Recursive Neural Networks and finally, very recent developments in Deep Learning techniques for NLP.

5. Choose your application area

After you complete studying, Machine Learning hits so far, you may want to get yourself familiar with one of the application areas. Depending on your inclination you can choose between

- Natural Language Processing
- Computer Vision (never studied computer vision, so not sure which one is a good online class)
- Applied Machine Learning. Many Data Scientist jobs require you to know Map-Reduce. To acquire those skills you can take theseIntroduction to Databases and followed by Mining Massive Datasets.

Well, after all this, you are destined for greatness in Machine Learning. I wish you good luck from the bottom of my heart🙂